

## CHAPTER 1: INTRODUCTION

Numerous species of marine plants and algae that grow in the ocean, rivers, lakes, and other bodies of water are collectively referred to as seaweed. Seaweeds are abundant and have been used for thousands of years in Eastern cultures for both food and healing (Zhang *et al.*, 2007). There are anti-inflammatory and anti-microbial properties in several seaweeds. Evidence from oral history also shows that the ancient Egyptians may have employed them to cure breast cancer.

Red algae is an important component of the ecosystem. Red seaweed is a healthy and delicious option because it contains many beneficial nutrients. It contains macro and micronutrients, carrying proteins, carbohydrates, phenols, vitamins and minerals (Lafarga *et al.*, 2020). Plants' true roots, stems, and leaves, as well as their specialized multicellular reproductive structures, are absent in algae. Algae are a group of primarily aquatic, photosynthetic, nucleus-bearing animals. The most common type of these red algae is rich in bioactive compounds and find applications in the health care industries as well as in the pharmaceutical, food, and manure sectors. The presence of distinctive colors is what distinguishes algae from red algae.

The antioxidant value of the red algae, *Eucheuma denticulatum* was studied by scientists in Malaysia and the United Kingdom; they found that red algae extraction promoted anti-inflammatory and anti-diabetic qualities (Balasubramaniam *et al.*, 2020). Red algae, in particular, have a superior antioxidant capability to other species, especially when it comes to neutralizing peroxy radicals. Due to the benefits of red algae, it is used in different research (Fleurence J., 1999).

When added to a high-cholesterol/high-fat diet, 5% seaweed reduced plasma total cholesterol by 7.1%, plasma low-density lipoprotein cholesterol by 27.3%, and plasma triglycerides by 2.4%, according to a study done by researchers at the University of Putra Malaysia (Abdul QA *et al.*, 2016).

A biologically active nutraceutical ingredient derived from seaweeds is called phycocyanin (PC) (De Jesus Raposo *et al.*, 2013; Pangestuti and Kim, 2011). Red and blue algae, green algae both contain the important light-harvesting accessory pigment known as phycocyanin. Phycocyanin which is obtained from Red algae is called R-PC (Kuddus *et al.*, 2013; Wang *et al.*, 2014).

In Japan, Thailand, and China, phycocyanin is used as a coloring agent in food (chewing gums, dairy goods, ice sherbets, gellies, etc.) and cosmetics like lipstick and eye liners. Nearly all phycocyanin is marine and is found deep in the water column.

The chemical compounds known as amino acids (AAs) are used to create bioactive peptides through a process known as peptide bonding. The bioactivity of peptides is determined by their amino acid sequence once they have been separated from the parent protein. Peptide bioactivity includes acetylcholinesterase inhibitory, dipeptidyl peptidase IV and III, and antioxidant, alpha-glucose etc. Peptides with unique bio-functional characteristics have been the subject of extensive study. Due to their dietary adaptability and multifunctionality, peptides derived from bovine milk proteins have been found to possess exceptional biological activity and health-promoting features. It suggests that milk protein-derived bioactive peptides can be used as an orally effective healthy component, and hence may be incorporated into the production of functional foods with beneficial health effects. More study is obviously required to evaluate the health-promoting effects and bioavailability of bioactive peptides produced from milk protein in human subjects and to understand their molecular mechanisms of action.

One of the primary independent risk factors for cardiovascular illnesses is hypertension or high blood pressure (Kennel *et al.*, 1990).

Angiotensin-I-converting enzyme (ACE) is crucial in the control of blood pressure among hypertension-related processes. It is important for blood pressure regulation because it promotes the conversion of angiotensin-I into the potent vasoconstrictor angiotensin-II and blocks the depressive impact of the vasodilator bradykinin in the renin-angiotensin system (Li GH *et al.*, 2003).

DPP-IV inhibitory peptides can be added in food to control in type 2 diabetes (Lacroix *et al.*, 2012). Gaining in depth knowledge of DPP IV inhibitory peptide properties through in silico approaches may improve potent DPP-IV inhibitory peptides release during the enzymatic breakdown of dietary proteins (Alice *et al.*, 2019).

The zinc-dependent enzyme dipeptidyl peptidase III (DPP III) cleaves N-terminal dipeptides from a variety of bioactive peptides. The development of therapeutic approaches for pain management may benefit from the in silico evaluation of putative DPP-III inhibitor precursors from dietary proteins (derived from animal and plant sources) and it is reported in the current communication (Tejinder *et al.*, 2015).

Making a large database of compounds for a given receptor before selecting the binders from commercial libraries, in silico evaluation is a well-established technology that aids in the early stages of drug manufacture (Pinto *et al.*, 2019; Marques *et al.*, 2020). BIOPEP Database can assess the proteins for their potential to provide bioactive peptides.

The overall aim of this study is to predict the potential bioactivity of phycocyanin from red algae and to identify efficient proteases for preparing bioactive peptides with dominating activity because among the several pigmentary proteins, phycocyanin stands out as both significant and singular. In addition, in silico bioinformatics methods are used to investigate the anticipated new peptide and their possible characteristics.

### **1.1 Significance of the research**

In silico approach is a computational method and it can be used before processing to predict the toxicity and bioactivity. In order to save time and money during the development of food or drug, it is crucial to be able to forecast the toxicity of therapeutic peptides/proteins before they are synthesized. Before processing in vitro study, In silico method will assist us to predict the bioactivity of phycocyanin and to predict whether it can be beneficial to us or not.

- 1) The pharmaceutical industry will be benefitted from this research by learning from where to acquire the basic materials needed to make pharmaceutical products.
- 2) For the development of natural food based products, this research will assist in food industry and seaweed industry.

### **1.2 Research Objectives**

- 1) Determine the prediction of bioactivity of Phycocyanin from red algae
- 2) Quick identification of Phycocyanin protein using in silico methods.

## CHAPTER 2: REVIEW OF LITERATURE

### 2.1 Red Algae

Red algae may be found in tidal pools and on coral reefs all around the world, from the Arctic to the tropics. Additionally, they are able to thrive at higher water depths than most other algae.

#### 2.1.1. Characteristics of Red Algae

The phylum Rhodophyta is home to a wide variety of microscopic species, from primitive one-celled animals to sophisticated multi-celled organisms, including the group known as red algae. There are about 6,000 different kinds of red algae, and as the name implies, they tend to be red, reddish, or even purple.

Green and brown algae are predominate. While green algae only carry one type of pigment, red algae have several, including chlorophyll, red phycoerythrin, blue phycocyanin, carotenes, lutein, and zeaxanthin. Phycoerythrin is the primary pigment, giving these algae their characteristic red color while absorbing blue light.

Throughout their existence, red algae lack both flagella and centrioles. Red algal cells may be distinguished from other cell types by their regular spindle fibers, microtubules, unstacked photosynthetic membranes, phycobilin pigment granules, pit connection between cells, and lack of chloroplast endoplasmic reticulum (W.J. *et al.*, 2018). Their lives have two or three distinct phases. They have a blade shape and a multicellular filamentary structure. They store food in the form of starch and galactan sulphate polymers.

Dietary techniques such as saprophytism, parasitism, and epiphytism are all viable options. The cell walls are made up of cellulose and a wide range of other carbohydrates. They can be found on solid surfaces, either as standalone organisms or in associations with other algae. It is capable of reproducing both sexually and asexually as well as vegetatively. Asexual reproduction occurs through the dissemination of monospores, while sexual reproduction causes a generational jump. Due to its ecological importance, red algae is consumed by a wide range of animals, including humans. Agar, used in numerous food products, is extracted from red algae. Their inclusion in some vitamin supplements and status as a rich source of calcium make them a useful food item.

### 2.1.2. Nutritional Composition of Red Algae

Protein makes up anywhere from 20-47% of the dry weight (dw) of red seaweed, 9-26% of the dw of green algae, and 3- 15% of the dw of brown seaweed. (Pliego-Cortex *et al.*, 2020).

Carrageenans-sulfated galactans, found in abundance in red algae, have many applications in the hydrocolloid industry, including those of thickening, texturizing, gelling, and stabilizing. (Torres MM *et al.*, 2018).

Conditions such as water temperature, light availability (for photosynthesis), and nutrient concentration all play a role in red algae's growth rate and nutrient content (Hagen *et al.*, 2004).

Palmitic, DHA, EPA, arachidonic and oleic acids are the most abundant in red algae, accounting for 31%, 21%, 13%, 9% and 8% respectively. Red algae has between 14% and 19% essential amino acids, whereas brown algae and green algae provide between 22% and 44% of the total (Fleurence J.1999)

Table 2.1: Nutritional Composition of red Algae (Giulianna *et al.*, 2020)

Composition (g/100g)	Protein	Fat	Carbohydrate	Dietary fiber	Ash	Energy (kcal)
Average	18.8	1.5	36.3	43.8	22.9	223.2

### 2.2 Health benefits of Bioactive compounds of Red Algae

Red microalgae are a rich source of beneficial compounds with widespread industrial applications. They contain several beneficial compounds found in nature, including those with anti-cancer, anti-inflammatory, anti-coagulant, anti-microbial effects on blood pressure. Vitamins, minerals, photochemicals, polyunsaturated fatty acids and a wide variety of polysaccharides can all be found in many red microalgae.

Porphyridium sp. (Rhodophyta), and particularly Porphyridium cruentum, are the most studied and used red microalgae in industry due to their ability to create useful biochemicals such extracellular polysaccharides, phycobiliproteins, and long-chain Poly unsaturated fatty acids (Wang *et al.*, 2021).

As a result of high protein content and high levels of indigestible dietary fibers, Galdieria sulphuraria has the potential to be absorbed into the human diet. Due to their ability to reach the colon and be converted into nutrients for the good lactic acid

bacteria, the indigestible fibers serve a crucial role in human health, boosting metabolism and the immune system (Wang *et al.*, 2021).

## **2.2 Red Algae sp.**

Pyropia is a genus of red algae distinguished by a discoid holdfast and a very short stipe. They have red, brown, and dark green membranous, monostromatic and bifid blades. When folded, these blades can resemble fronds. Some species fronds can grow to reach a meter long and 20 cm broad. Many Pyropia species were originally classified as Porphyra, a separate genus of red algae. Such as *Neopyropia yezoensis*, *Pyropia pulchra*, *Pyropia endiviifolia*, *Neoporphyra haitanensis*, *Pyropia fucicola*, *Pyropia kanakaensis*, *Neoporphyra dentata*, *Neoporphyra perforata*. *Polysiphonia urcceolata*, a kind of red algae, may grow to be as long as 30 centimeters in length and are characterized by their polysiphonous nature and extensive branching. They connect to rocks or other algae by rhizomes and haptera, respectively. Finely branching filaments, each with an axial filament supporting pericentral cells, make up the thallus (tissue) (Newton, L, 1931)

The red algal *Galdieria sulphuraria* is an extremophile and the smallest known alga. For taxonomists, this is the gold standard; every other *Galdieria* species can be traced back to this one. It can photosynthesize and develop heterotrophically on more than 50 distinct extracellular carbon sources, and its versatility has made it well-known.

## **2.3 Red seaweed protein sequences**

The NCBI database (<http://www.ncbi.nlm.nih.gov/>) is used to confirm the presence of proteins (Wong *et al.*, 2001). It provides a curated database of sequences that can be used to represent genomic information, RNA, and protein (Pruitt *et al.*, 2005).

The FASTA sequences of proteins are mined from the UniPort database (<http://www.uniprot.org/>). UniProt (Universal Protein Resource) is a public, searchable database of protein-related information from which we get protein sequences. If we know the accession number, we can get the FASTA sequence of the needed protein. BLAST is used to compare a user-supplied protein sequence to a database of known protein structures (Basic Local Alignment Search Tool). This program is used to analyze the significance of analytical matches between a query sequence and a database of protein or nucleotide sequences (Singh *et al.*, 2016).

## **2.4 Evaluation of Red Algae bioactive peptides through BIOPEP-UWM database**

We can determine the probability through BIOPEP-UWM database, which comprises 4510 known bioactive peptides with 56 biological activities. The BIOPEP-UWM database has grown in popularity as a data source for studies on the bioactivity and flavor of peptides, particularly those found in food (Minkiewicz *et al.*, 2022). Through BIOPEP-UWM database we can evaluate the protein as potential precursor of bioactive peptides. The frequency of occurrences, Number of active fragments all are predicted through BIOPEP-UWM database.

## **2.5 *In silico* proteolysis**

Bioactive peptides in foods and halobios including milk, beef, tilapia, sea cucumber, and others are commonly studied and synthesized using *in silico* proteolysis (Lafarga *et al.*, 2014, Chang Y W *et al.*, 2015). In a study, *in silico* proteolysis helped to identify the oligopeptides from Traditional Chinese Medicine with superior biological activity and it also claimed to discover the pharmacological activity of metabolites of Traditional Chinese Medicine (Qiao L. *et al.*, 2016).

The allergenic proteins in food materials and processed products were investigated by determining their molecular indicators. This method can be used to assess the quality *in silico* and verified *in vitro* for their ability to be hydrolyzed by enzymes into antihypertensive peptides. Using the BIOPEP database, they found that thermolysin (EC 3.4.24.27) was predicted to be the enzyme that would potentially produce the most oat ACE inhibitory peptides (Cheung *et al.*, 2009).

## **2.6 Virtual screening and characterization of novel tri-peptide**

Based on their known activity, the number of bioactive fragments released from Pyropia, Galdieria and Polysiphonia, Neoporphyra sp proteins was estimated manually. To help to locate fragments with known bioactivities, BIOPEP-UWM provides a list of those that are currently stored in the database. Di- and Tri-peptides accounted for the vast majority of the DPP-IV inhibitory activity sequences reported in BIOPEP-UWM. Short dipeptidyl peptidase IV (DPP-IV) inhibitors (five amino acid or less) have been shown to be effective. Thus, the three amino-acid peptide fragments reported by Lafarga were submitted for ranking in terms of their potential activity (Lafarga *et al.*, 2014). This opened the door for additional research into unique

tri-peptides generated by proteolysis with the selected enzyme. To access Peptide Ranker, it is needed to run through <http://distilldeep.ucd.ie/PeptideRanker/>.

Using an N-to-1 neural network approach, this bioinformatics tool can estimate and rank the probability that a specific peptide would exhibit bioactive qualities. One of the problems with the tool is that it may not provide the optimal solution. Computer simulations were also used to examine the potential properties of peptides. They performed test for water solubility, GI tolerance, toxicity, allergenicity and IC<sub>50</sub>. The expected water solubility was determined using PepCalc, which can be found online at <http://pepcalc.com>. Predictions of GI digestion were made using PeptideCutter, which can be accessed at <http://web.expasy.org/peptidecutter>. Chymotrypsin (low specificity), chymotrypsin (high specificity), pepsin (pH 1.3), pepsin (pH > 2) and trypsin were used to test the degree of resistance present.

ToxinPred and AllerTOP, two bioinformatics tools that can be found at <http://www.imtech.res.in/raghava/toxinpred/> and <http://www.pharmfac.net/allertop/>, were used to evaluate the toxicity and allergenicity of the compounds under consideration. A support vector machine (SVM) based prediction method was selected for the toxicity prediction, with a threshold value of 0.0 (Lafarga T *et al.*, 2014). The estimated IC<sub>50</sub> was calculated with AHTpin, which can be found at <https://webs.iiitd.edu.in/raghava/ahtpin/index.php>. Antihypertensive peptides in particular can be predicted, screened, and designed with the aid of a program called AHTpin. Quantitative structure activity relationship (QSAR) based regression models are the basement for the inhibitory activity estimation of tiny (di and tri) peptides in AHTpin (Taher R A *et al.*, 2020). The OECD's principles on economic cooperation have been incorporated into this base. For this reason, the IC<sub>50</sub> value is expressed by AHTpin as pIC<sub>50</sub> value =  $-\log(\text{IC}_{50} \times 10^{-6})$  (K N Sharmin *et al.*, 2021).

## **2.7 MALDI-TOF mass spectrometry**

Matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) mass spectrometry (MS) has been a massive benefit to clinical microbiology by allowing for the rapid and accurate identification of bacteria, mycobacteria and some fungal pathogens. Mass spectrometry is an analytical method that measures the mass-to-charge (m/z) ratio of ionized molecules. Matrix-assisted laser desorption/ionization (MALDI) is the ion source in MALDI-TOF mass spectrometry, and the time-of-flight (TOF) analyzer is the mass analyzer. Mixing or coating the material to be analyzed by



MALDI MS with a solution of an energy-absorbent, organic molecule called matrix is the first step in getting it ready for analysis.

As the matrix dries, it forms crystals and the sample within the matrix forms crystals alongside them. Using a laser beam, the sample inside the matrix is ionized in an automated fashion. In order to produce single protonated ions from analytes in the sample, we first desorb them and ionize them into a laser beam. The ionized particles are accelerated at a constant potential, at which point they are separated according to their mass to charge ratio ( $m/z$ ). Mass analyzers, such as quadrupole mass analyzers, ion trap analyzers, time of flight (TOF) mass analyzers etc are used to detect and quantify the charged analytes. TOF mass analyzers are widely employed in the field of microbiology.

Time taken for an ion to travel the flight tube length is used to calculate the  $m/z$  ratio during MALDI-TOF analysis.

## **2.8 Protein hydrolysis**

There are a few goals that can be accomplished through hydrolyzing proteins. The goal of protein hydrolysis is to release more amino acids and carboxyl groups from peptide bonds. Increased solubility and digestibility of the resultant hydrolysate (Contreras *et al.*, 2019).

The most typical method is to reduce the size of the peptides in a food product in order to make the protein molecule soluble. When a protein is solubilized, it is much easier to physically separate the molecular component into use. Functional, organoleptic, and nutritional qualities of meals can all be enhanced by the use of protein hydrolysis (Chabanon *et al.*, 2007). Hydrolysis of proteins can be accomplished by a single enzyme (like trypsin) or by a combination of enzymes (e.g., a mixture of proteases known as Pronase, pepsin and prolidase). Enzymes are selected based on the kind of protein and the desired degree of hydrolysis.

### **2.8.1 Factors affecting protein hydrolysis**

The concentration of enzymes, substrate, reaction duration and reaction temperature are all variables in the hydrolytic process that determine the final hydrolysate product. Many enzymes are applied for protein hydrolysis, such as trypsin, chymotrypsin, ficin, papain, thermolysin and bromelain etc.

- I. Concentration of enzymes: Under optimum enzymatic hydrolysis conditions, enzymes have been used in concentrations of up to 5% of the sample. However, a concentration range of 0.1-1.5% has been widely used.
- II. Reaction duration : The yields of protein, total amino acids and reducing sugars in the soluble products are studied as a function of temperature (200-220°C), reaction time (10-30 min), and raw material -to- water weight ratio (1:5 and 2:5).
- III. Reaction temperature : Protein hydrolysis can be occurred at high temperatures (160°C for 45-60 minutes, 170°C for 30-45 minutes or 180°C for 30 minutes).
- IV. pH value : A method for the controlled enzymatic hydrolysis of proteins in the pH range 1.5-3.5 is described. Constant pH allows acid intake to follow breakdown of the peptide bond. Hydrolysis degree of proteins can be calculated with this value.
- V. Concentration of substrate : The rate of enzymatic protein hydrolysis is slowed when the concentration of the substrate increases.

## **2.9 Protein extraction**

Isolating and purifying protein from whole tissue, cell culture or biological fluid samples is known as protein extraction. Protein extraction procedures are developed specifically for each sample and assay. Extraction of proteins is typically done for one of two main reasons: preparative use (making vast quantities of the same protein for use, such as insulin or lactase) or analytical use (extracting a small amount of protein to use in structural or functional research )

### **2.9.1 Method 1 (Urea extraction and acetone precipitation)**

Conceptualization of this approach owes much to the research conducted by Wang et al. (2003a) and Forster et al (2006). Powdered tissue was resuspended in 15 mL of 2-DE-standard lysis buffer (9 M urea, 4% w/v 3-[(3-cholamidopropyl) dimethylammonio]-1-propanesulfonate [CHAPS], 60 mM dithiothreitol [DTT], 40 mM Tris-HCl pH 7.4), 1% w v carrier ampholytes pH 3-10 (immobilized pH gradient [IPG] buffer; Amersham Biosciences; Uppsala, Sweden), and a complete protease inhibitor cocktail (Roche Diagnostics Ltd., Lewes, UK). One tablet in fifty milliliters of extraction buffer. To ensure uniformity, the mixture was centrifuged at a constant rate of 10,000g for 20 minutes in a Hettich Zentrifugen (Universal 32R) at Tuttlingen, Germany. After two hours of incubation at 20°C in five liters of ice-cold acetone

containing 20 mM DTT, the proteins that had precipitated were pelleted by centrifugation at 10,000g for twenty minutes.

### **2.9.2 Method 2 (Urea extraction, ultracentrifugation, and acetone precipitation)**

The extraction methods followed the same steps as in Approach 1. Once the liquid phase had been homogenized and centrifuged at 10,000g for 20 minutes, it was ultracentrifuged at 100,000g for 1 hour.

### **2.9.3 Method 3 (Urea extraction, ultracentrifugation, and trichloro acetic acid (TCA)/acetone precipitation)**

Proteins were precipitated in 10% v v TCA in 100% ice-cold acetone overnight, centrifuged at 10,000g for 20 minutes, and then washed seven times in four volumes of 80% ice-cold acetone before being extracted in the same manner as described in Method 2.

### **2.9.4 Method 4 (Phenol extraction)**

Following established techniques for difficult-to-cultivate plants, proteins were extracted from the plants using phenol (Wang *et al.*, 2003b, Saravanan and Rose, 2004, Carpentier *et al.* 2005). A few adjustments were made to the extraction buffer, and the reagent concentration was bumped up. Extraction buffer (1.5% w/v polyvinylpyrrolidone [PVP], 0.7 M sucrose, 0.1 M KCl, 0.5 M Tris-HCl pH 7.5, 250 mM EDTA, 1 tablet per 50 mL extract of complete protease inhibitor cocktail, 2% v/v  $\beta$ -mercaptoethanol, and 0.5% glycerol) was used to resuspend the powdered tissue. After adding an equal amount of Tris-HCl pH 7.5-saturated phenol, the mixture was rehomogenized for 20 minutes at 4C. To separate the phenol layer at the top of the mixture, we centrifuged the mixture at 10,000g for 20 minutes. We redialed the extraction of the base phase using the same quantity of phenol as before. Five liters of 0.1 M ammonium acetate dissolved in methanol were added to the phenol phase after incubating the mixture at 20°C for three hours to precipitate the proteins. After centrifuging the extract at 10,000g for 20 minutes at 20°C, the supernatant was discarded and the protein pellet was washed with ammonium acetate (0.1 M in methanol). Washing the protein pellet seven times in four liters of ice cold acetone (80%) and once in cold acetone (20 mM DTT).

### **2.9.5 Method 5 (Phenol extraction and desalting steps)**

Excess salt was removed from the tissue by flushing it with a mixture of Milli Q water (Barnstead International, Easy pure II, RF ultra pure water system, Dubuque, IA, USA;

15-20 s) and 50 mM Tris-HCl pH 8.8 four times (15–20 s). The algal tissue was then weighed and blotted dry before being stored in the refrigerator at -80°C. Following a pulverization in liquid nitrogen, tissue was subjected to the phenol technique for protein extraction. After the protein was precipitated in cold acetone, the 2-D Clean-up Kit (Amersham Biosciences, Piscataway, NJ, USA) was used to do a final cleaning. Protein extracts were then flash-frozen at 800 degrees Celsius for later usage.

## **2.10 Bioactive peptides**

Enzymatic hydrolysis by digestive tract enzymes, fermentation with proteolytic starter cultures (for example, milk proteins), proteolysis by enzymes originating from microbes and plants, and proteolytic action by indigenous proteases present in protein can all provide bioactive peptides (Minkiewicz *et al.*, 2008). Proteins are polypeptides with a higher molecular weight, whereas bioactive peptides are organic compounds generated by amino acids connected by covalent connections known as amide or peptide bonds. Peptides with biological activity are shorter than proteins (as proteins usually consist of longer sequences of more than 200 amino acids). They are resistant to digestion peptidases because they have more hydrophobic residues than typical proteins.

### **2.10.1 Angiotensin-converting enzyme (ACE) inhibitors**

Medications known as angiotensin-converting enzyme (ACE) inhibitors are effective at reducing blood pressure by relaxing the veins and arteries. Angiotensin-converting enzyme (ACE) inhibitors work by blocking the enzyme responsible for making the blood vessel constricting hormone angiotensin II. This constriction raises blood pressure and increases cardiac output. Hormones released by angiotensin II can contribute to elevated blood pressure. Conditions affecting the heart and blood vessels are treated with these medications.

### **2.10.2 DPP IV inhibitors**

Type 2 diabetes mellitus is a major risk factor for coronary disease, heart failure, stroke, and many other cardiovascular problems; dipeptidyl peptidase 4 (DPP-4) inhibitors are a class of antihyperglycemic drugs used to control this illness. These regulate blood sugar levels in response to eating by stimulating production of incretin hormones in the intestines.

Glucose homeostasis is maintained by increasing insulin production and lowering glucagon secretion, and DPP-IV is a ubiquitous enzyme that works on incretin

hormones, primarily GLP-1 (glucagon-like peptide-1) and GIP (gastric inhibitory peptide) (Capuano *et al.*, 2013). Neuroendocrine K-cells in the stomach and upper portion of the small intestine are responsible for its secretion. Incretins are hormones that are released shortly after eating, and due to their short half-life, DPP-IV rapidly begins degrading them. Antidiabetic drugs raise GLP-1 and GIP levels, which stimulate beta-cell insulin release in the pancreas and lower blood sugar levels after meals and overnight.

### **2.10.3 Alpha-glucosidase inhibitors**

Blood sugar can be lowered with antihyperglycemic drugs called alpha-glucosidase inhibitors, which prevent or slow the digestion and absorption of complex carbohydrates. They block the enzymes in the brush border of enterocytes responsible for breaking down oligosaccharides into monosaccharides through competitive inhibition. Their primary effect is to lower the increase in plasma glucose that follows a meal. Recent research in healthy patients suggests that Alpha-glucose inhibitors therapeutic effects may be dependent not only on the delayed digestion of complex carbs but also on the metabolic consequences of colonic starch fermentation (Wachters-Hagedoorn *et al.*, 2007). No hypoglycemia effects from AGIs are to be even at the point of overdosing and other potentially fatal situations causes no weight gain (Chiasson *et al.*, 2003).

### **2.11 In silico approach**

An in silico experiment is one that is carried out on a computer or through computer simulation in biology and other experimental sciences. A further in vitro investigation revealed the Phe-Cys dipeptide's significant antioxidative capabilities (Udeniqwe *et al.*, 2013; Je *et al.*, 2015).

It was recently discovered that bovine serum albumin contains new peptides and inhibit ACE and DPP-IV (Lafarga *et al.*, 2016). Some of the in vitro software included Peptide Ranker and BIOPEP. These results show clearly the benefits of starting with in silico research before moving on to more time-consuming and laborious wet-lab methods of analyzing enzyme function. Since experimental methods have their limits in terms of throughput, accuracy, and cost, researchers throughout the world have been

increasingly interested in the development of in silico target identification algorithms as a cost-effective alternative (Rao *et al.*, 2011).

### **2.11.1. Importance of In silico approach**

Whole-cell study of bacterial and eukaryotic hosts like *E. coli*, *B. subtilis*, yeast, human cell lines has benefited from in silico computer-based modeling tools. Possible treatment for the deadly COVID-19 virus has been discovered. Improvements to existing bioprocesses, such as increased product yields, Using grid computing infrastructures like the European Grid Infrastructure to boost the efficiency and realism of cancer clinical trial simulations, data mining, analysis, and visualization of heterologous data sets, like as genomic, transcriptomic, or proteomic data, Planning of proteins has been executed by in silico approach.

### **2.11.2. Advantages and Limitations of In silico approach**

In addition to being cost and time-effective, computational methods for predicting peptide toxicity also make it possible to build more effective therapeutic peptides that are less toxic without losing any of their therapeutic benefits (Gupta *et al.*, 2013). Ability to qualitatively and quantitatively evaluate potential therapies for individual diseases and to test a wider range of situations is made possible by the use of in silico computational models (e.g. dosing). Moreover, network-level disease modeling permits customizing treatment/device for each patient in advance of administration/implantation. For complicated diseases with varying treatment responses throughout the patient population, in silico modeling offers the potential to allow precision medicine.

The problem is that this time frame, which can be as brief as a few milliseconds, is typically insufficient for analyzing protein folding. Consequently, this can cause "inadequate sampling" of protein conformations. In silico models have been utilized for drug repurposing as well as drug design optimization.

## CHAPTER 3: MATERIALS AND METHODS

### 3.1. Sample for protein sequences

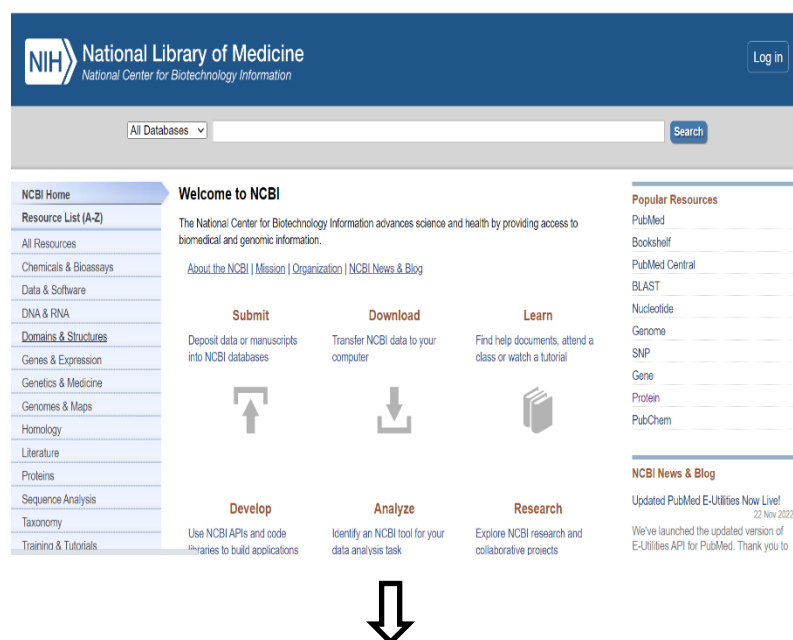
As a phycocyanin rich sample, red algae such as *Neopyropia yezoensis*, *Pyropia Pulchra*, *Pyropia endiviifolia*, *Neoporphyra haitanensis*, *Pyropia fucicola*, *Pyropia kanakaensis*, *Neoporphyra dentata*, *Polysiphonia urceolata*, *Galdieria sulphuraria* were used. After Maldi Tof mass analysis, we choose the higher protein sequence from Uniprot database.

### 3.2. Red seaweed protein sequences

Phycocyanin is a member of the phycobiliprotein protein family and is a special type of pigment protein. The biotechnological applications of this compound are extensive. so, the large number of sequences in the uniprot database pleases our interest, and we investigate it. We select red seaweed phycocyanin sequences from a wide variety of species. 17 proteins were available (accessed on 19<sup>th</sup> April, 2022). Then, we use BLAST to find sequences with the same protein sequences.

The NCBI database (<http://www.ncbi.nlm.nih.gov/>) was used to confirm the presence of 17 proteins discovered (Wong *et al.*2001). The FASTA sequences and other general features of the 17 proteins were mined from the UniPort database (<http://www.uniprot.org/>).

Using the BIOPEP-UWM database, we evaluate the protein from *Pyropia* sp, *Polysiphonia* sp, and *Galdieria* sp, *Neoporphyra* sp as potential precursor of bioactive peptides.



Results found in 4 databases

PROTEIN SEQUENCE

**Allophycocyanin alpha chain**

Neopyropia yezoensis  
Sequence length: 161 aa  
P59856

FASTA Gene

Download BLAST

Literature Genes Proteins



NIH National Library of Medicine  
National Center for Biotechnology Information

Protein  Search

FASTA

**RecName: Full=Allophycocyanin alpha chain**

UniProtKB/Swiss-Prot: P59856.3  
GenPept Identical Proteins Graphics

```
>sp|P59856.3|P5A4_NEOYE RecName: Full=Allophycocyanin alpha chain
MSIVTKSIVNADAEARYLSQGLDRILKSFVLSQQRRLRISLQQLTDRERLIVIQGQQLFKRQFDVVSQGE
NAVGEEMTATCLRDLDLYLRLVTVGIVAGDVTPEEEELGVGVEMVNSLGTPTSGVAEGVCKN%SVACSL
LAGEDSAEAGFVFDYTLGAYQ
```

Analyze this sequence  
Run BLAST  
Identify Conserved Domains  
Highlight Sequence Features

Articles about the apcA gene  
Insights into the red algae and eukaryotic evolution from # [Proc Natl Acad Sci U S A. 2017]  
Minimally destructive sampling of type specimens of Pyropia (Bangiales, Rhodophyta) [Sci Rep. 2014]  
Complete sequence and analysis of plastid genomes of two economically i [PLoS One. 2013]



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Proteins (current number: 739)	Please cite the following paper if you are using these databases: Minkiewicz P, Iwanik A, Darewicz M, 2018. BIOPEP-UWM Database of Bioactive Peptides: Current Opportunities. International Journal of Molecular Sciences, 20, 5978. doi:10.3390/ijms20235978
Bioactive peptides (current number: 4530)	
Allergenic proteins with their epitopes (current number: 136)	Please cite the following paper if you are using BIOPEP-UWM database of allergenic proteins and their epitopes: Dzuba M, Minkiewicz P, Dąbek M, Peptides, specific proteolytic products as molecular markers of allergenic proteins – in silico studies. Acta Scientiarum Polonorum Technologia Alimentaria, 12, 2013, 101-112
Sensory peptides and amino acids (current number: 533)	Please cite the following paper if you are using BIOPEP-UWM database of sensory peptides and amino acids: Iwanik A, Minkiewicz P, Darewicz M, Sieniewski K, Starowicz P, 2018. BIOPEP database of sensory peptides and amino acids. Food Research International, 85, 155-161. doi: 10.1016/j.foodres.2018.04.031
BIOPEP-UWM Virtual (current number: 222)	Our new database. Please cite the following paper if you are using BIOPEP-UWM Virtual database: Minkiewicz P, Iwanik A, Darewicz M, 2022. BIOPEP-UWM Virtual-A Novel Database of Food-Derived Peptides with In Silico-Predicted Biological Activity. Applied Sciences, 12(14):7204. doi: 10.3390/app12147204

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Figure 3.1 : NCBI and FASTA format for protein sequence



### 3.3 Evaluation of Red Algae species as potential precursor of bioactive peptides through BIOPEP-UWM database

The probability was that the selected protein sequences would yield bioactive fragments using information from the BIOPEP-UWM database, which comprises 4530 known bioactive peptides with 56 biological activities (accessed on 22th September, 2022). The total quantity of bioactive peptides was calculated by selecting the “profiles of possible biological activity” option in BIOPEP-UWM. We looked at each proteins’s projected actions carefully. We counted by hand how many pieces had the expected activity.

**BIOPEP-UWM: Bioactive peptides**

ANALYSIS

Number of peptides in database: 4530

ID	Name	Sequence	Chem. mass	Monols. mass	
Peptide Data 2566	regulating cell-permeability peptide	NYKPKL	890.0882	889.5344	0.00 EC <sub>50</sub>
Peptide Data 2567	regulating cell-permeability peptide	NYKPKLAAPALLALLVAPLAVAA	2601.2592	2599.6114	0.00 EC <sub>50</sub>
Peptide Data 2568	regulating cell-permeability peptide	AAVALLPVLALLAPAAANYKPKL	2601.2592	2599.6114	0.00 EC <sub>50</sub>
Peptide Data 2569	regulating cell-permeability peptide	NYKPKLAAAAMALLPWLALLAP	2601.2592	2599.6114	0.00 EC <sub>50</sub>
Peptide Data 2570	VII-hemorphin-7	VYIPWTQRF	1185.3822	1184.6145	0.00 EC <sub>50</sub>
Peptide Data 2571	VII-hemorphin-5	VYIPWTQ	892.0172	891.4455	0.00 EC <sub>50</sub>
Peptide Data 2572	vasopressin	CYFQNPGRG-	1119.8702	1119.4324	0.00 EC <sub>50</sub>
Peptide Data 2573	Precursor of vasopressin	CYFQNPGRG	1178.0062	1177.4374	0.00 EC <sub>50</sub>
Peptide Data 2574	Neuropeptide	YKPR	562.6642	562.3205	0.00 EC <sub>50</sub>
Peptide Data 2575	Iuifasin	TKPR	500.5992	500.3045	0.00 EC <sub>50</sub>
Peptide Data 2576	Coeliac toxic calreticulin fragment	YQLLELCCDHL	1524.4762	1523.8635	0.00 EC <sub>50</sub>
Peptide Data 2577	Coeliac toxic calreticulin fragment	QEDVPLVOGF	1215.3752	1214.6245	0.00 EC <sub>50</sub>
Peptide Data 2578	Coeliac toxic peptide	PSQQQP	683.7222	683.3205	0.00 EC <sub>50</sub>
Peptide Data 2579	tenecin-1 (35-43)	NGKRVCVCR-	1067.0032	1066.5224	0.00 EC <sub>50</sub>
Peptide Data 2580	Precursor of tenecin-1 (35-43)	NGKRVCVCRG	1125.0392	1124.5274	0.00 EC <sub>50</sub>

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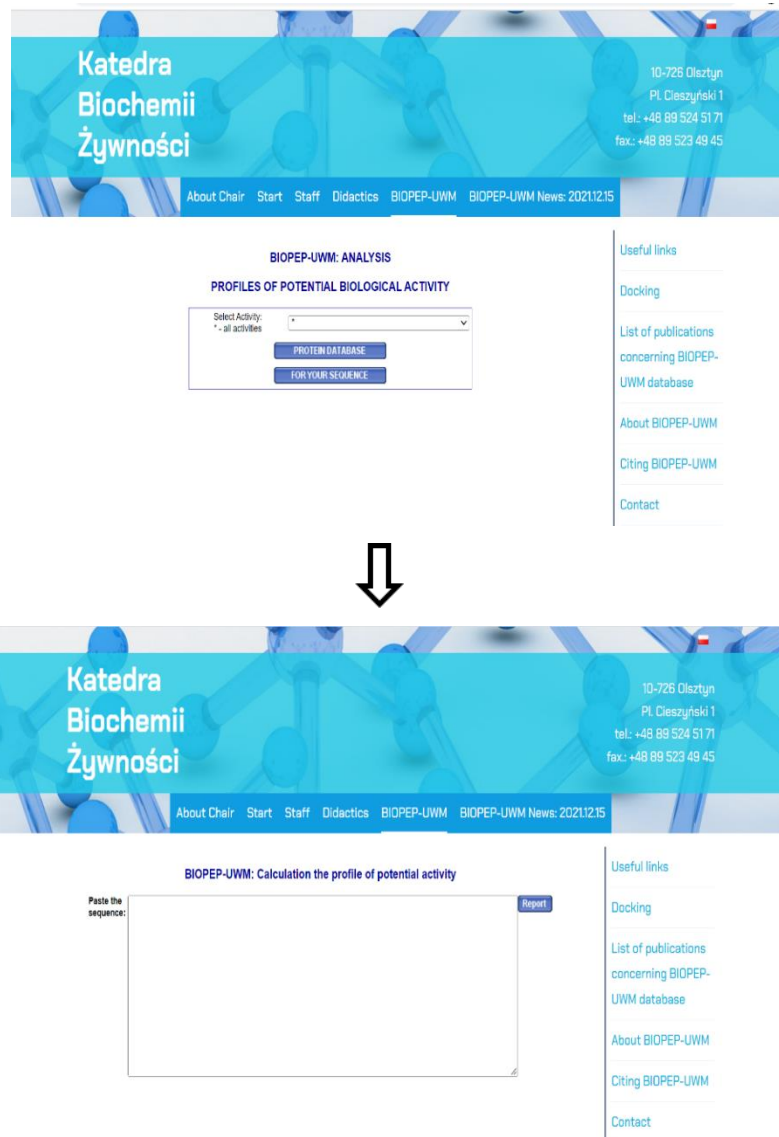
**BIOPEP-UWM: ANALYSIS**

PROFILES OF POTENTIAL BIOLOGICAL ACTIVITY CALCULATIONS ENZYMES ACTION

FIND BATCH PROCESSING DEFINITIONS SMILES

FIND THE ENZYME FOR PEPTIDE RELEASE





**Figure 3.2: Profiles of potential Biological activity**

The study focuses on the most typical occurrences. Using the following equation, we were able to determine the occurrence rate (A) of bioactive fragments in the pyropia sp, Galdieria sp, Polysiphonia sp, Neoporphyra sp.

$$A = a/N$$

where a is the fraction of the protein sequence that exhibits the desired activity, and N is the total number of amino acids in the protein. In addition, the average occurrence of bioactive fragments (A) was measured across all 17 protein sequences. Bioactive fragments have been discovered in these species. The sequence for the ACE inhibitor, DPP IV inhibitor, and alpha glucosidase inhibitor was found independently. The protein's potential biological activity relates to its beneficial features (such as ACE

inhibition, antioxidant properties, DPP IV inhibition, etc.). The potential biological activity of protein (B) was calculated using the following equation.

$$B = \frac{\sum_{i=1}^k \frac{a_i}{EC_{50i}^*}}{N}$$

where  $a_i$  is the fraction of the protein sequence occupied by the  $i$ -th bioactive fragment,  $^*EC_{50i}$  is the concentration of the  $i$ -th bioactive peptide corresponding to half-maximal activity [M] or half-maximal inhibition (IC<sub>50</sub>) in the case of inhibitory peptides,  $k$  is the number of distinct fragments with the given activity, and  $N$  is the number of amino acid residues. The only values that are reported by BIOPEP-UWM are those for ACE inhibitors, DPP IV inhibitors, hypotensive medications, alpha-glucosidase inhibitors, and opioid B (K N Sharmin *et al.*, 2021)

### 3.4 In silico proteolysis to release of potential peptides

In-silico proteolysis was performed with the help of BIOPEP-“enzyme/s UWM’s activity” tool. Using papain, thermolysin, stem bromelain, Chymotrypsin, the most common peptides were independently extracted from the most common protein sequences. The expected degree of hydrolysis (DH%) was computed by the database.

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BIOPEP-UWM: ANALYSIS  
ENZYME(S) ACTION

PROTEIN DATABASE  
FOR YOUR SEQUENCE  
SEARCH FOR ENZYMES WITH GIVEN SPECIFICITY

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### BIOPEP-UWM: Enzymes action for your sequence

Paste the sequence:

```

MSIVTSLVNADEARYLSPGELDRISFVLSQRRLRLAQQLTDHREIYVQGGQQLFQRPDPVVSFGNAYSEENTATCLRDLDIY
PIEEGLVGVKEMYSLPTISVAEIVCHSVACSLAAGEDSAEAFYFDYTLGAIQ
  
```

Select enzymes

Enzyme id:  [View enzyme](#)

Enzyme id:  [View enzyme](#)

Enzyme id:  [View enzyme](#)

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### BIOPEP-UWM: Report of enzyme action

Results of enzyme action

M - SVYTKSVN - ADAEARY - L - SPGEL - DRKSPF - VL - SGQRRL - RIAQL - TDN - RERVKGGQGL - F - GQRPDVSPFGN - AY - GDEM - TATCL - RDL - DV - Y - L - RL - VTY - GVAQDVTPEEIGL - YGVKEM - Y - N - SL - GTPISGVAEIVCHM - KSVACSL - L - AGEDSAEAF - Y - F - DY - TL - GAI - Q

[Search for active fragments](#) [CALCULATE  \$A\_E\$ ,  \$DH\$ ,  \$W\$ ,  \$B\_E\$ ,  \$V\$](#)

Location of released peptides

[1-1],[2-10],[11-17],[18-18],[19-23],[24-29],[30-31],[32-37],[38-43],[44-46],[47-58],[59-59],[60-71],[72-73],[74-77],[78-82],[83-85],[86-87],[88-88],[89-89],[90-81],[92-94],[95-109],[110-115],[116-116],[117-117],[118-118],[120-133],[134-140],[141-141],[142-151],[152-152],[153-153],[154-155],[156-157],[158-160],[161-161]



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### BIOPEP-UWM: CALCULATE $A_E$ , $DH$ , $W$ , $B_E$ and $V$

No	Activity	$A_E$	$W$	$B_E$	$V$
1	regulating	0.0194	0.5000	0	NAN
2	ACE inhibitor	0.0245	0.0519	0.0004451078714555	0.02833090956824
3	antioxidative	0.0061	0.1105	0	NAN
4	stimulating	0.0061	0.0904	0	NAN
5	dipeptidyl peptidase IV inhibitor	0.0307	0.0521	8.5342326835143E-5	0.40738082096048

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**Figure 3.3: Degree of Hydrolysis**

To evaluate the efficiency of fragment release, the following formula was used to compute the frequency of bioactive fragments released by the selected enzymes ( $A_E$ ) and the relative frequency of released peptides with a particular activity ( $W$ ):

$$W = \frac{A_E}{A}$$

Where  $d$  is the fraction of the protein sequence that is transformed into active peptides when treated with the enzyme of choice, and  $N$  is the total number of amino acid residues.

$$A_E = \frac{d}{N}$$

### 3.5 Portparam tools

ProtParam (References / Documentation) can determine a large number of physical and chemical properties for any protein in Swiss-Prot or TrEMBL, or for a user-entered protein sequence. There is a tool called ProtParam that can make educated guesses about a protein's chemical and physical properties from its sequence. The molecular weight and pH of a protein, for example, can be calculated from its primary sequence. The protein of interest can be specified either by its Swiss-Prot/TrEMBL accession number or ID, or by its raw sequence. Tools such as protparam (<https://web.expasy.org/protparam>) can determine the presence or absence of an essential amino acid's composition.

ExPASy ProtParam Home Contact

ProtParam tool

ProtParam (References / Documentation) is a tool which allows the computation of various physical and chemical parameters for a given protein stored in Swiss-Prot or TrEMBL, or for a user entered protein sequence. The computed parameters include the molecular weight, theoretical pI, amino acid composition, atomic composition, extinction coefficient, estimated half-life, instability index, aliphatic index and grand average of hydropathicity (GRAVY) (Disclaimer).

Please note that you may only fill out one of the following fields at a time.

Enter a Swiss-Prot/TrEMBL accession number (AC) (for example P05130) or a sequence identifier (ID) (for example KPCL\_DROME):  
P59856

Or you can paste your own amino acid sequence (in one-letter code) in the box below:

RESET Compute parameters

**Figure 3.4: Protparam tool using protein sequence**

### 3.5.1 Peptide Ranker

To determine which peptides might be biologically active, the web service Peptide Ranker employs a novel N-to-1 neural network. Peptide Ranker is a tool that ranks the bioactivity potential of peptides based on a user-supplied list of peptides. There is no indication of the potential bioactivity here. The bioactivity score predicted by peptide ranker (<http://distilldeep.ucd.ie/PeptideRanker>) is determined. PeptideRanker was optimized for a 0.5 cutoff, meaning that any peptide with a prediction score greater than 0.5 is considered bioactive. PeptideRanker can be used to find bioactive peptides in silico, and then the peptides can be modified in vitro to see which ones work best at boosting bioactivity.

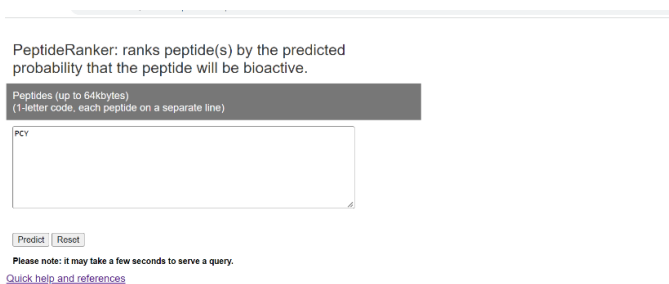


Figure 3.5: PeptideRanker tool for peptide score

### 3.5.2. Peptide calculator

To find out how many milligrams (mg) of research peptides are included in each unit or tick mark of a reconstituted insulin or tuberculin (non-insulin) syringe, you can use PepCalc, a straightforward peptide calculator. If you want to know how much peptide to take, this is the easiest way to accomplish it. Using pepcalc.com, we may determine the molecular weight in gm/mol, the solubility in water, and the net charge at a pH of 7.

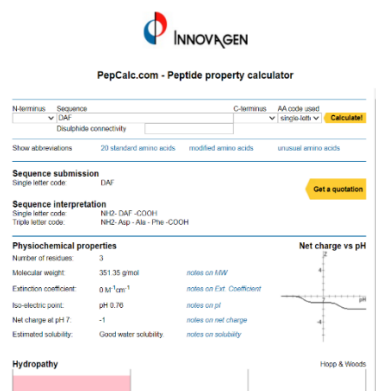


Figure 3.6: PepCalc for physico-chemical property

### 3.5.3 Bioinformatics tool for allergenicity prediction

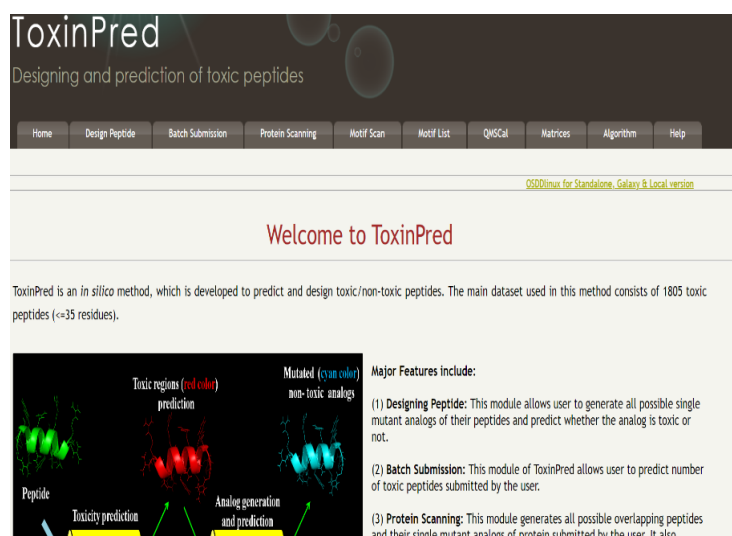
Auto cross covariance (ACC) transformation is used in this method to normalize protein sequences into vectors. In order to extract information from protein sequences, Wold et al. developed a technique termed automatic complementation of sequences (ACC). allertop (<https://www.ddg-pharmfac.net/AllerTOP>) is a program used to calculate the allergenicity likelihood of a given compound.

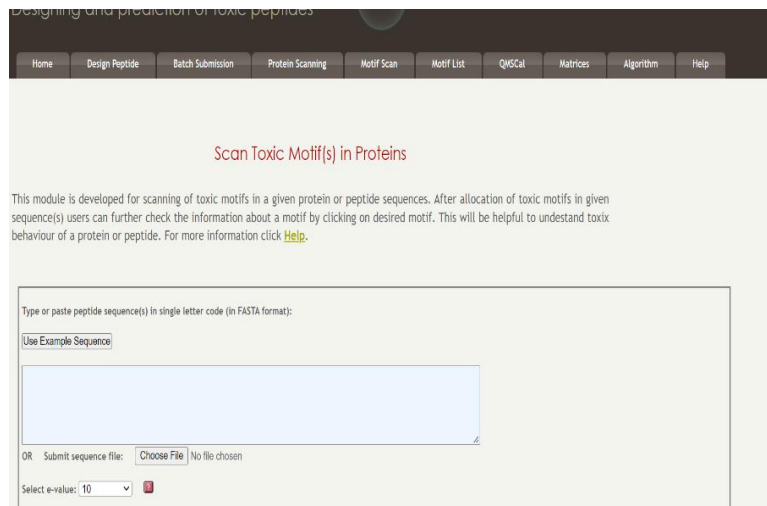


Figure 3.7: Allertop for Allergenicity prediction

### 3.5.4 Toxicity prediction

ToxinPred (<http://crdd.osdd.net/toxinpred>) is a computational technique for the prediction of toxic and non-toxic peptides. We used the technique for having the prediction of Protein sequences which are toxic or non toxic.

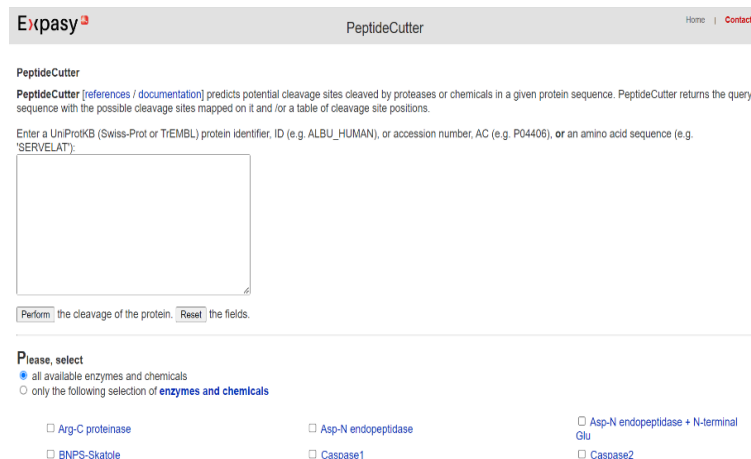




**Figure 3.8: ToxinPred for toxicity prediction**

### 3.5.5 Peptide cutter

We can examine protein sequences with Peptide Cutter [references / documentation] to find places where proteases or chemicals might cut the protein. Peptide Cutter gives us a table of cleavage site positions as well as a visualized representation of probable cleavage sites over the query sequence. peptide cutter (<https://web.expasy.org/peptide-cutter>) can decipher peptides that are resistant to digestion.



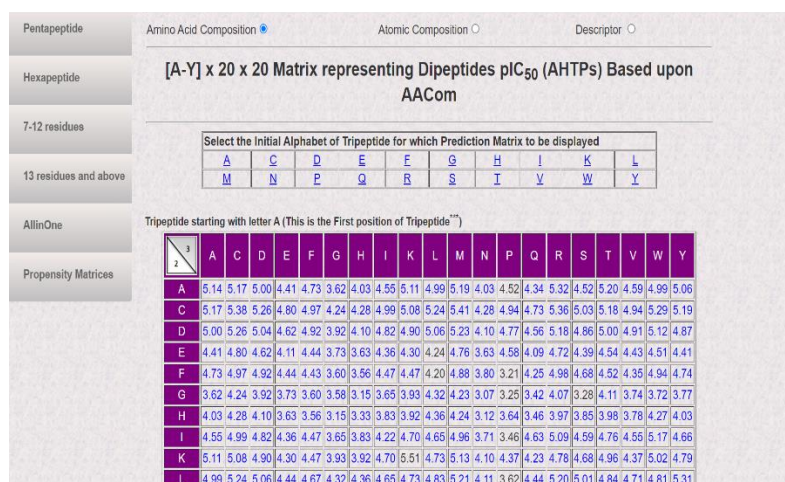
**Figure 3.9: Determination of resistance of Digestion**

### 3.5.6 AHTpin

Effective antihypertensive peptides can be predicted and designed in silico using a method called AHTpin. This module generates every mutant by swapping out a single amino acid at a time and predicts the antihypertensive efficacy of the resulting peptides. The user can then select the mutant peptide that is most effective in treating



hypertension. Using AHTpin (<http://crdd.osdd.net/raghava/ahtpin>), we can estimate the ACE inhibitor's IC<sub>50</sub>(I1/4 M).



**Figure 3.10: IC<sub>50</sub> value Determination**

## CHAPTER 4: RESULTS

### 4.1 Protein identified by MALDI-TOFF mass spectrometry

Total Seventeen protein found in different red algae sp.

Table 4.1: protein name & accession number used in in silico analysis

Accession no.	Organism	Protein	MW(KD)	Amino Acid length
P59856	OS=Neopyropia yezoensis	Allophycocyanin alpha chain	17,509	161
Q1XDB0	OS=Neopyropia yezoensis	C-phycocyanin beta chain	18,201	172
Q1XDA9	OS=Neopyropia yezoensis	C-phycocyanin alpha chain	17,464	162
Q1XDS1	OS=Neopyropia yezoensis	Allophycocyanin subunit beta-18	19,161	169
A0A141SF63	OS=Pyropia pulchra	Phycocyanin alpha subunit	17,464	162
A0A1U6ZGH2	OS=Pyropia endiviifolia	Phycocyanin alpha subunit	17,464	162
D6QTA1	OS=Neoporphyra haitanensis	Phycocyanin alpha subunit	17,464	162
A0A059XHS0	OS=Pyropia fucicola	Allophycocyanin beta-18 subunit	19,059	169
A0A059XHV7	OS=Pyropia fucicola	Allophycocyanin beta chain	17,484	161
A0A059XLB0	OS=Pyropia kanakaensis	Allophycocyanin beta-18 subunit	19,130	169
A0A6F8SI63	OS=Neoporphyra dentata	Phycocyanin alpha subunit	17,464	162
A0A023HQS5	OS=Neoporphyra perforata	Allophycocyanin beta-18 subunit	19,230	169
A0A6F8SGE9	OS=Neoporphyra dentata	Allphycocyanin gamma chain	18,059	161
P00311	OS=Galdieria sulphuraria	C-phycocyanin beta chain	18,253	172
P59859	OS=Polysiphonia urceolata	R-phycocyanin beta chain	18,001	172
P00306	OS=Galdieria sulphuraria	C-phycocyanin alpha chain	17506	162
P59858	OS=Polysiphonia urceolata	R-phycocyanin alpha chain	17570	162

#### 4.2 Essential amino acid percentage

By using the protparam utilities, we were able to determine the relative abundance of the eight most crucial and two of the least crucial amino acids. The majority of the protein is rich in the nine essential amino acids.

Protein name	Accession No.	His(H) %	Ile (I) %	Leu (L)%	Lys (L) %	Met (M) %	Phe (F) %	Thr (T) %	Trp (W) %	Val (V) %	Arg (Ar) %
Allophycocyanin alpha chain	P59856	0.0	6.2	9.3	4.3	3.1	2.5	5.0	0.0	8.7	6.2
C-phycocyanin beta chain	Q1XDB0	0.0	4.1	9.9	2.9	3.5	2.3	4.1	0.0	9.3	5.8
C-phycocyanin alpha chain	Q1XDA9	0.6	6.2	8.6	3.1	2.5	1.9	6.2	0.6	4.9	4.9
Allophycocyanin subunit beta-18	Q1XDS1	0.6	9.5	13.6	3.0	0.6	1.8	5.9	0.0	3.6	6.5
Phycocyanin alpha subunit	A0A141SF63	0.6	6.2	8.6	3.1	2.5	1.9	6.2	0.6	4.9	4.9
Phycocyanin alpha subunit	A0A1U6ZGH2	0.6	6.2	8.6	3.1	2.5	1.9	6.2	0.6	4.9	4.9
Phycocyanin alpha subunit	D6QTA1	0.6	6.2	8.6	3.1	2.5	1.9	6.2	0.6	4.9	4.9
Allophycocyanin beta-18 subunit	A0A059XHS0	0.6	9.5	13.6	3.6	0.6	1.8	4.7	0.0	3.6	5.9
Allophycocyanin beta chain	A0A059XHV7	0.0	8.1	9.9	4.3	3.1	1.2	6.8	0.0	5.6	5.6
Allophycocyanin beta-18 subunit	A0A059XLB0	0.6	10.1	13.0	3.0	0.6	1.8	5.3	0.0	3.6	6.5
Phycocyanin alpha subunit	A0A6F8SI63	0.6	6.2	8.6	3.1	2.5	1.9	6.2	0.6	4.9	4.9
Allophycocyanin beta-18 subunit	A0A023HQS5	0.6	10.1	13.0	3.0	0.6	1.8	5.3	0.0	4.1	6.5
Allphycocyanin gamma chain	A0A6F8SGE9	0.6	15.5	9.3	4.3	3.1	1.2	3.1	0.6	3.1	6.8
C-phycocyanin beta chain	P00311	0.0	7.0	8.1	2.9	3.5	2.3	5.2	0.0	7.0	6.4
R-phycocyanin beta chain	P59859	0.0	5.2	9.3	2.9	2.9	2.3	5.8	0.0	8.1	5.8
C-phycocyanin alpha chain	P00306	0.6	5.6	8.0	3.1	2.5	1.9	5.6	0.6	4.3	4.9
R-phycocyanin alpha chain	P59858	0.6	5.6	8.6	4.3	2.5	1.9	8.0	0.6	4.9	4.3



### 4.3 *In silico* analysis

Multiple studies have shown that *in silico* methods are effective by showing that they agree with laboratory hydrolysis results.

**Table 4.3** Number of potential bioactive peptides and potential biological activity (B) of identified proteins using BIOPEP

Protein name	NCBI Accession No.	Number of active Fragments						Stimulating
		ACE Inhibitor (B)	Alpha Glucosidase Inhibitor	Anti oxidative	DPP III inhibitor	DPP IV inhibitor (B)	Renin Inhibitor	
Allophycocyanin alpha chain	P59856	79 (0.0160)	3 (9.728)	9	16	96 (0.002)	5	11
C-phycocyanin beta chain	Q1XDB0	71 (0.0064)	2 (5.686)	5	14	101 (0.0004)	5	6
C-phycocyanin alpha chain	Q1XDA9	86 (0.0625)	5 (1.608)	18	12	99 (0.00014)	7	4
Allophycocyanin subunit beta-18	Q1XDS1	74 (0.0245)	2 (5.842)	17	12	102 (0.0002)	9 (3.164)	16
Phycocyanin alpha subunit	A0A141SF63	86 (0.0625)	5 (1.608)	18	12	99 (0.00014)	7	4
Phycocyanin alpha subunit	A0A1U6ZGH2	86 (0.0625)	5 (1.608)	18	12	99 (0.00014)	7	4
Phycocyanin alpha subunit	D6QTA1	86 (0.0625)	5 (1.608)	18	12	99 (0.00014)	6	4
Allophycocyanin beta-18 subunit	A0A059XHS0	77 (0.0247)	2 (5.842)	18	13	101 (0.0002)	9	16
Allophycocyanin beta chain	A0A059XHV7	84 (0.011)	2 (5.222)	16	14	105 (0.0002)	8	7
Allophycocyanin beta-18 subunit	A0A059XLB0	77 (0.0247)	2 (5.843)	18	13	100 (0.0002)	9	16
Phycocyanin alpha subunit	A0A6F8SI63	86 (0.0625)	5 (1.608)	18	12	99 (0.00014)	7	4
Allophycocyanin beta-18 subunit	A0A023HQS5	78 (0.024)	2 (5.842)	18	11	100 (0.0002)	8 (3.164)	16
Allophycocyanin gamma chain	A0A6F8SGE9	80 (0.015)	4 (4.555)	15	16	99 (0.00014)	8 (0.003)	11
C-phycocyanin beta chain	P00311	76 (0.0114)	1 (2.266)	5	11	109 (0.0002)	7	8

R-phycoerythrin beta chain	P59859	73 (0.008)	1 (2.266)	6	17	112 (0.0005)	5	10
C-phycoerythrin alpha chain	P00306	83 (0.059)	6 (1.971)	12	12	105 (0.0002)	6	4
R-phycoerythrin alpha chain	P59858	76 (0.060)	6 (1.934)	13	13	99 (0.00027)	6 (1.991)	4

**Table 4.4 :** The frequency of occurrence of peptides with a given activity (A) in selected protein sources

Protein name	NCBI Accession No.	Number of activities	$\Sigma A$	A1 (ACE Inhibitor)	A2 (DPP IV Inhibitor)	A3 (Alpha Glucose Inhibitor)
Allophycoerythrin alpha chain	P59856	13	1.4596	0.4783	0.5963	0.0186
C-phycoerythrin beta chain	Q1XDB0	14	1.2848	0.4128	0.6105	0.0116
C-phycoerythrin alpha chain	Q1XDA9	19	1.6114	0.5309	0.6111	0.0309
Allophycoerythrin subunit beta-18	Q1XDS1	12	1.4321	0.4379	0.6036	0.0118
Phycocyanin alpha subunit	A0A141SF63	19	1.6114	0.5309	0.6111	0.0309
Phycocyanin alpha subunit	A0A1U6ZGH2	19	1.6114	0.5309	0.6111	0.0309
Phycocyanin alpha subunit	D6QTA1	19	1.6114	0.5309	0.6111	0.0309
Allophycoerythrin beta-18 subunit	A0A059XHS0	12	1.4615	0.4556	0.5976	0.0118
Allophycoerythrin beta chain	A0A059XHV7	16	1.6459	0.5217	0.6522	0.0124
Allophycoerythrin beta-18 subunit	A0A059XLB0	12	1.4556	0.4556	0.5917	0.0118
Phycocyanin alpha subunit	A0A6F8SI63	19	1.6114	0.5309	0.6111	0.0309
Allophycoerythrin beta-18 subunit	A0A023HQS5	12	1.4496	0.4615	0.5917	0.0118
Allophycoerythrin gamma chain	A0A6F8SGE9	16	1.5899	0.4969	0.6149	0.0248
C-phycoerythrin beta chain	P00311	14	1.337	0.4419	0.0058	0.6337
R-phycoerythrin beta chain	P59859	14	1.4127	0.4244	0.0058	0.6512
C-phycoerythrin alpha chain	P00306	19	1.605	0.5123	0.6481	0.037
R-phycoerythrin alpha chain	P59858	19	1.5123	0.4691	0.6111	0.037



Table 4.5.1: The predicted efficiency of release of bioactive fragments from selected red algae protein by in silico proteolysis for ACE inhibitor

Protein ID	Chymotrypsin			Papain			Pepsin			Thermolysin			Trypsin			Steam Bromelain		
	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W
P59856	33.95	0.0552	0.1169	41.975 3	0.067 5	0.142 9	11.728 4	0.006 1	0.012 9	39.506 2	0.049 1	0.103 9	10.493 8	0.012 3	0.026 0	56.790 1	0.073 6	0.155 8
Q1XDB0	31.791 9	0.0345	0.0846	43.930 6	0.069 0	0.169 1	12.138 7	-	-	43.352 6	0.011 5	0.028 2	8.6705	-	-	62.427 7	0.069 0	0.169 1
Q1XDA9	37.423 3	0.0427	0.0814	43.558 3	0.067 1	0.128 0	10.429 4	-	-	41.717 8	0.061 0	0.116 3	7.9755	-	-	57.055 2	0.073 2	0.139 6
Q1XDS1	42.352 9	0.0643	0.1486	43.452 4	0.041 4	0.094 5	15.294 1	-	-	42.352 9	0.017 5	0.040 4	9.4118	-	-	50.588 2	0.052 6	0.121 6
A0A141SF63	37.423 3	0.0427	0.0814	43.558 3	0.067 1	0.128 0	10.429 4	-	-	41.717 8	0.061 0	0.116 3	7.9755	-	-	57.055 2	0.073 2	0.139 6
A0A1U6ZGH2	37.423 3	0.0427	0.0814	43.558 3	0.067 1	0.128	10.429 4	-	-	42.236 0	0.061 7	0.116 2	7.9755	-	-	57.055 2	0.073 2	0.139 6
D6QTA1	37.423 3	0.0427	0.0814	43.558 3	0.067 1	0.128 0	10.429 4	-	-	41.717 8	0.061 0	0.116 3	7.9755	-	-	57.055 2	0.073 2	0.139 6
A0A059XHS0	42.352 9	0.0643	0.1428	43.529 4	0.040 9	0.090 8	15.294 1	-	-	42.941 2	0.017 5	0.038 9	9.4118	0.005 8	0.012 9	50.000 0	0.052 6	0.116 8
A0A059XHV7	33.333 3	0.0613	0.1190	43.209 9	0.049 1	0.095 3	11.111 1	-	-	43.827 2	0.036 8	0.071 4	9.8765	0.012 3	0.023 9	56.172 8	0.055 2	0.107 1
A0A059XLB0	42.352 9	0.0702	0.1559	43.529 4	0.040 9	0.090 8	14.705 9	-	-	42.941 2	0.017 5	0.038 9	9.4118	-	-	50.000 0	0.052 6	0.116 8
A0A6F8SI63	37.423 3	0.0427	0.0814	43.558 3	0.067 1	0.128	10.429 4	-	-	41.717 8	0.061 0	0.116 3	7.9755	-	-	57.055 2	0.073 2	0.139 6
A0A023HQS5	43.529 4	0.0702	0.1539	42.352 9	0.046 8	0.102 6	14.705 9	-	-	42.352 9	0.023 4	0.051 3	9.4118	0.005 8	0.012 7	49.411 8	0.046 8	0.102 6
A0A6F8SGE9	34.567 9	0.0613	0.1249	37.654 3	0.079 8	0.162 6	10.493 8	0.006 1	0.012 4	40.740 7	0.067 5	0.137 5	11.111 1	0.012 3	0.025	45.679 0	0.049 1	0.1
P00311	30.057 8	0.0230	0.0527	45.086 7	0.063 2	0.144 7	10.404 6	-	-	42.774 6	0.023 0	0.052 7	9.2486	-	-	58.959 5	0.080 5	0.184 3
P59859	29.479 8	0.0230	0.0548	47.976 9	0.080 5	0.191 9	11.560 7	-	-	47.976 9	0.011 5	0.027 4	8.6705	-	-	62.427 7	0.063 2	0.150 7
P00306	38.650 3	0.0244	0.0482	45.398 8	0.042 7	0.084 4	9.8160	-	-	42.944 8	0.048 8	0.096 4	7.9755	-	-	55.214 7	0.054 9	0.108 5
P59858	37.267 1	0.0309	0.0659	41.614 9	0.037 0	0.078 9	10.303 0	-	-	41.104 3	0.042 7	0.092 1	8.5890	-	-	55.214 7	0.067 1	0.144 8



Table 4.5.2: The predicted efficiency of release of bioactive fragments from selected red algae protein by in silico proteolysis for DPP-IV inhibitor

Protein ID	Chymotrypsin			Papain			Pepsin			Thermolysin			Trypsin			Steam Bromelain		
	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W
P59856	33.9506	0.0552	0.0937	41.9753	0.0982	0.1667	11.7284	0.0184	0.0312	39.5062	0.0552	0.0937	10.4938	-	-	56.7901	0.0736	0.125
Q1XDB0	31.7919	0.0460	0.0762	43.9306	0.1149	0.1904	12.1387	0.0057	0.0094	43.3526	0.0460	0.0762	8.6705	0.0057	0.0094	62.4277	0.1149	0.1904
Q1XDA9	37.4233	0.0793	0.1314	43.5583	0.0671	0.1111	10.4294	-	-	41.7178	0.0427	0.0707	7.9755	0.0061	0.0101	57.0552	0.0854	0.1415
Q1XDS1	42.3529	0.0819	0.1373	43.5294	0.0994	0.1666	15.2941	-	-	42.3529	0.0351	0.0588	9.4118	-	-	50.5882	0.0936	0.1569
A0A141SF63	37.4233	0.0793	0.1314	43.5583	0.0671	0.1111	10.4294	-	-	41.7178	0.0427	0.0707	7.9755	0.0061	0.0101	57.0552	0.0854	0.1415
A0A1U6ZGH2	37.4233	0.0793	0.1314	43.5583	0.0671	0.1111	10.4294	-	-	41.7178	0.0427	0.0707	7.9755	0.0061	0.0101	57.0552	0.0854	0.1415
D6QTA1	37.4233	0.0793	0.1314	43.5583	0.0671	0.1111	10.4294	-	-	41.7178	0.0427	0.0707	7.9755	0.0061	0.0101	57.0552	0.0854	0.1415
A0A059XHS0	42.3529	0.0819	0.1387	43.5294	0.0994	0.1683	15.2941	-	-	42.9412	0.0351	0.0594	9.4118	-	-	50.0000	0.0936	0.1585
A0A059XHV7	33.3333	0.0429	0.0666	43.2099	0.1104	0.1714	11.1111	0.0061	0.0095	43.8272	0.0613	0.0952	9.8765	0.0061	0.0095	56.1728	0.0982	0.1524
A0A059XLB0	42.3529	0.0760	0.1300	43.5294	0.0936	0.1601	14.7059	-	-	42.9412	0.0351	0.0600	9.4118	-	-	50.0000	0.0819	0.1400
A0A6F8SI63	37.4233	0.0793	0.1314	43.5583	0.0671	0.1111	10.4294	-	-	41.7178	0.0427	0.0707	7.9755	0.0061	0.0101	57.0552	0.0854	0.1415
A0A023HQS5	43.5294	0.0760	0.1300	42.3529	0.0994	0.1700	14.7059	-	-	42.3529	0.0351	0.0600	9.4118	0.0058	0.0099	49.4118	0.0702	0.1200
A0A6F8SGE9	34.5679	0.0429	0.0706	37.6543	0.0920	0.1515	10.4938	0.0123	0.0203	40.7407	0.0552	0.0909	11.1111	0.0123	0.0203	45.6790	0.0675	0.1111
P00311	30.0578	0.0575	0.0918	45.0867	0.1092	0.1743	10.4046	0.0057	0.0091	42.7746	0.0517	0.0825	9.2486	0.0057	0.0091	58.9597	0.1437	0.2294
P59859	29.4798	0.0460	0.0715	47.9769	0.1322	0.2054	11.5607	0.0115	0.0179	47.9769	0.0517	0.0803	8.6705	0.0057	0.0089	62.4277	0.1034	0.1606
P00306	38.6503	0.0793	0.1239	45.3988	0.0366	0.0572	9.8160	-	-	42.9448	0.0427	0.0667	7.9755	0.0061	0.0095	55.2147	0.0854	0.1334
P59858	36.8098	0.0671	0.1111	41.1043	0.0366	0.0606	10.4294	-	-	41.1043	0.0244	0.0404	8.5890	0.0061	0.0101	55.2147	0.0976	0.1617

Table 4.5.3: The predicted efficiency of release of bioactive fragments from selected red algae protein by in silico proteolysis for Alpha Glucosidase inhibitor

Chymotrypsin			Papain			Pepsin			Thermolysin			Trypsin			Steam Bromelain		
DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W	DHT	AE	W
33.9506	-	-	41.9753	0.0061	0.3315	11.7284			39.5062	0.0061	0.3315	10.4938			56.7901	0.0123	0.6685
31.7919	-	-	43.9306	0.0057	0.4957	12.1387			43.3526	0.0057	0.4957	8.6705			62.4277		
37.4233	0.0061	0.2000	43.5583	0.0671	0.1111	10.4294			41.7178	0.0061	0.2000	7.9755			57.0552	0.0122	0.4000
42.3529	-	-	43.5294	-	-	15.2941			42.3529			9.4118			50.5882		
37.4233	0.0061	0.2	43.5583	-	-	10.4294			41.7178	0.0061	0.2000	7.9755			57.0552	0.0122	0.4000
37.4233	0.0061	0.2000	43.5583	-	-	10.4294			41.7178	0.0061	0.2000	7.9755			57.0552	0.0122	0.4000
37.4233	0.0061	0.2000	43.5583	-	-	10.4294			41.7178	0.0061	0.2000	7.9755			57.0552	0.0122	0.4000
42.3529	-	-	43.5294	-	-	15.2941			42.9412			9.4118			50.0000		
33.3333	-	-	43.2099	-	-	11.1111			43.8272	0.0061	0.4959	9.8765			56.1728		
42.3529	-	-	43.5294	-	-	14.7059			42.9412			9.4118			50.0000		
37.4233	0.0061	0.2000	43.5583			10.4294			41.7178	0.0061	0.2	7.9755			57.0552	0.0122	0.4
43.5294	-	-	42.3529	-	-	14.7059			42.3529			9.4118			49.4118		
34.5679	-	-	37.6543			10.4938			40.7407			11.1111			45.6790		
30.0578	-	-	45.0867	0.0057	1.0000	10.4046			42.7746	0.0057	1	9.2486			58.9595		
29.4798	-	-	47.9769	0.0057	1.0000	11.5607			47.9769	0.0057	1.0000	8.6705			62.4277		
38.6503	0.0061	0.1667	45.3988			9.8160			42.9448	0.0061	0.1667	7.9755			55.2147	0.0183	0.5000
36.8098	-	-	41.1043			10.4294			41.1043			8.5890			55.2147	0.0122	0.3333

Table 4.6: Bioactive peptides predicted to be released from red algae protein based on in silico enzymolysis

Enzyme	ACE Inhibitor	DPP-IV Inhibitor	Alpha-Glucosidase Inhibitor
Chymotrypsin	133 RL(8),AY(4),GE(7),IE(4), DY(8),FQ(6),IL(9),ARY, RY(13),GL(9),TQ(3),KE(9), IAE,VY(5),GP(7),VE(6), SVY(5),VAP(3),HL(4),SY(4), RP(4),VGP,TE(3),GM,KY, IAP(2),GW,GQ,KL,HP,ASL	190 SP(8),SL(8),AY(4),FQ(6),GE(7), IL(9),RL(8),TL(7),FL(3), AL(20),GL(9),IQ(2),KE(9), TQ(3),TY(11),IN(12),RM(7), SW(7),TN(6),VE(6),VY(5), RP(4),HL(4),SY(4),GP(5), DQ(6),TE(3),HP,AE(3),VN, KY,DP,GW.	6 VE (6)
Papain	162 YL(5),YG(3),VG(2),AG(18), QG(10),SG(8), AR(19), ER(2), DR(6),AF(3),NG(8), PG(7),AV(3),AEL,QP(2),EF(2), ASL(8),SF(5),KF(5), PT(5), AI(10),VR(6),DY(5), KE(5),ST(5),SY,IG(2),IR, KR,PL, QK.	240 AD(4),AE(4), AG(17), AT(18), DR(7),QG(10),QL(17),VG, VL(7),VT,YF(5),YG(3), YL(5), QP(3), AL(28), AF(3),AS(8), ET(3),ML(5),NG(8),PG(7), SL(7),KF(5),NE(5),NN(6), PT(5),SF(5),KE(5),VR(5), IN(4),AV(4),NR(5),SI(4), QD(5),QT,VG,YT,SY,APG,IL, IR,PL,VS,QY.	4 AD(4)
Thermolysin	110 YG(2), IG(11), AG(8), LG(9), AR(4),LR(12), FP(7), VG(6), VE(6),LQ(12),LEE(7),IE(5), LRM(7), VP(6), VR, VK, IR(2), AP, LN.	123 YT,AD(5),AE(9),AG(8), VG(7), VN(2),VT(9),YG(2), AS(23),VS(4), YQ(3), FP(7), VE(6), VP(6), IN(6), IQ(5), YD(4), AT(7), VK,AP,LT,LN, LM,IR(2), FQ.	11 AD(5), VE(6)
Stem Bromelain	178 YL(10),YG(4),IA(14),KR, DA(10),EG(4),EA(17), EV, PG(12),ER(3),DR(8),EF(3), YA(21),QG(8),NG(15), YV(3),IG(8),HG(5),KF(7), KA(7), PT(8),IL(7),IR ,PL.	247 IA(14), DR(8), EG(4), KS(2), NA(15), PG(12), YG(4),YF(6), YL(10),MA(2),YT(13), ET(3), KV(3),ML(5), MV(8),QA(10), QG(8),QL(9),YA(22), NG(15), NT(7),YV(3),KA(8),KF(7), NV(5),PS(7), PT(9),ES(2), QS(10),IL(7),NR(7),PV(3), QT,KS,YS(3),QV,IR,PL, KR,EV.	17 EA(17)

**Table 4.7: Predicted potential novel peptide released from *Red Algae* protein**

Peptide	Sequence	Predicted Bioactive score	Enzyme	molecular wt. gm/mol	Solubility in water	net charge at PH 7	Resistance to digestion	toxicity	allergence probability	Predicted $IC_{50}$ ACE Inhibitor
CL	Cys-Leu	0.8799	Chymotrypsin, papain, Stem Bromelain	234.32	Poor	-0.1	No	Non toxin	Allergen	3.67
RSF	Arg-Ser Phe	0.8349	Chymotrypsin	408.45	Good	1	No	Non toxin	Non Allergen	5.18
GAM	Gly-Ala-Met	0.8139	Chymotrypsin	277.34	Poor	0	No	Non toxin	Non Allergen	4.23
DAF	Asp-Ala-Phe	0.7489	Chymotrypsin	351.35	Good	-1	No	Non toxin	Allergen	4.92
RRM	Arg-Arg-Met	0.7556	Chymotrypsin	461.59	Good	2	No	Non toxin	Non Allergen	4.90
AM	Ala-Met	0.7455	Chymotrypsin, papain, thermolysin	220.29	Poor	0	No	Non toxin	Non Allergen	3.65
GRY	Gly-Arg-Tyr	0.7321	Chymotrypsin	394.43	Good	1	No	Non toxin	Allergen	4.11
RTF	Arg-Thr-Phe	0.7199	Chymotrypsin	422.48	Good	1	No	Non toxin	Allergen	4.48
SKF	Ser-lys-Phe	0.6739	Chymotrypsin	380.44	Good	1	No	Non toxin	Allergen	4.61
RGY	Arg-Gly-Tyr	0.6106	Chymotrypsin	394.43	Good	1	No	Non toxin	Non Allergen	4.21
RDM	Arg-Asp-Met	0.5718	Chymotrypsin	420.49	Good	0	No	Non toxin	Non Allergen	5.37
WYL	Trp-Tyr-Leu	0.9521	Papain, Stem Bromelain	480.56	Poor	0	No	Non toxin	Non Allergen	5.20
SYF	Ser-Tyr-Leu	0.8962	Papain, Stem Bromelain	381.42	Poor	0	No	Non toxin	Non Allergen	5.19
YCL	Tyr-Cys-Leu	0.8316	Papain, Stem Bromelain	397.49	Poor	-0.1	No	Non toxin	Non Allergen	5.65
QIF	Gln-Ile-Phe	0.8035	Papain	406.48	Poor	0	No	Non toxin	Allergen	4.89

ACL	Ala-Cys-Leu	0.7467	Papain	305.4	Poor	-0.1	No	Non toxin	Allergen	5.24
SPG	Ser-Pro-Gly	0.6975	Papain	259.26	Good	0	Yes	Non toxin	Allergen	4.70
QPG	Gln-Pro-Gly	0.6604	Papain	300.31	Poor	0	Yes	Non toxin	Allergen	4.60
MSL	Met-Ser-Leu	0.6023	Papain	349.45	Poor	0	No	Non toxin	Allergen	5.65
AMI	Ala-Met-Ile	0.5230	Papain	333.45	Poor	0	No	Non toxin	Allergen	4.96
MS	Met-Ser	0.5211	Papain, Stem Bromelain, Thermolysin	236.29	Good	0	No	Non toxin	Non Allergen	3.68
AYG	Ala-Tyr-Gly	0.5157	Papain	309.32	Poor	0	No	Non toxin	Allergen	3.77
IG	Ile-Gly	0.5018	Papain	188.22	Poor	0	Yes	Non toxin	Allergen	2.92
WYV	Trp-Tyr-Val	0.717	Stem Bromelain	406.53	Poor	0	No	Non toxin	Non Allergen	5.09
PIG	Pro-Ile-Gly	0.670	Stem Bromelain	285.34	Poor	0	Yes	Non toxin	Allergen	4.62
CIR	Cys-Ile-Arg	0.6596	Stem Bromelain	390.5	Good	0.9	No	Non toxin	Allergen	5.53
MQ	Me-Gln	0.5536	Stem Bromelain	277.34	Poor	0	No	Non toxin	Non Allergen	3.64
CS	Cys-Ser	0.514	Stem Bromelain	208.24	Good	-0.1	Yes	Non toxin	Allergen	3.71
YGM	Tyr-Gly-Met	0.886	Thermolysin	369.44	Poor	0	No	Non toxin	Allergen	4.52
FD	Phe-Asp	0.9221	Thermolysin	280.28	Good	-1	No	Non toxin	Non Allergen	3.79
FDR	Phe-Asp-Arg	0.847	Thermolysin	436.46	Good	0	No	Non toxin	Allergen	5.17
LC	Leu-Cys	0.8407	Thermolysin	234.32	Poor	-0.1	No	Non toxin	Allergen	3.67
YC	Tyr-Cys	0.8200	Thermolysin	284.33	Poor	-0.1	No	Non toxin	Allergen	4.06

IGM	Ile-Gly-Met	0.8088	Thermolysin	319.42	Poor	0	No	Non toxin	Non Allergen	4.63
AC	Ala-Cys	0.735	Thermolysin	192.24	Poor	-0.1	Yes	Non toxin	Non Allergen	3.68
FQH	Phe-Gln-His	0.696	Thermolysin	430.46	Poor	0.1	No	Non toxin	Non Allergen	3.35
HC	His-Cys	0.646	Thermolysin	258.3	Poor	0	No	Non toxin	Non Allergen	3.68
LRG	Leu-Arg-Gly	0.635	Thermolysin	344.41	Good	1	No	Non toxin	Allergen	4.81
FE	Phe- Glu	0.5897	Thermolysin	294.3	Good	-1	No	Non toxin	Allergen	5.84
PYF	Pro-Tyr-Phe	0.974	Stem Bromelain	425.49	Poor	0	No	Non toxin	Allergen	4.35

## CHAPTER 5: DISCUSSIONS

The research aimed to evaluate the bioactivity of phycocyanin protein of *Pyropia*, *Galdieria*, *Polysiphonia* species.

### 5.1 Sequences of selected protein

Table 5.1 lists the identified protein with their accession number, molecular mass (kDa) & amino acid residue. Number of the amino acid presented in selected 17 proteins are between 161 to 173. Among the phycocyanin protein, Phycocyanin alpha subunit is dominant. Compared with *Gracilaria changii* (red algae), number of amino acid presented in proteins were 161-177 and their dominant protein was phycoerythrin, phycocyanin, allophycocyanin (Sharmin K N et al., 2022).

### 5.2 The prospect of red algae as precursor for bioactive peptides

With the help of the BIOPEP-UWM database, it may be found out how many bioactive peptides each protein is predicted to secrete. Based on existing information of BIOPEP-UWM database, 4518 peptides formed in 56 bioactivities have been collected, fragments with 21 biological activities were found in 17 different red algae species. In silico analysis reveals that these red algae show antioxidant, stimulating, antihypertensive, antithrombotic, anti diabetic activity. In another report, cryptic bioactive peptides with antioxidative, dipeptidyl peptidase IV (DPP-IV) inhibitory and ubiquitin-mediated proteolysis activity were discovered in the green algae *Caulerpa* RuBisCO (UbMp) (Agirbasli Z et al., 2017). Peptides can trigger cell death in a variety of ways, including membrane lysis and necrosis, apoptosis, prevention of tumor angiogenesis, modulation of the immune system, disruption of cell signaling pathways, regulation of the cell cycle, regulation of DNA repair pathways, and cell death pathways (Li C M et al., 2021).

In the findings, DPP-IV inhibitor has the highest active fragments from 96 to 112 but its B value is lower than that of ACE inhibitor (table 4.3). Similarly, Alpha glucose inhibitor has the lower active fragments from 1 to 6, but its B value is higher. From the table 4.3, it reveals that ACE inhibitor, DPP IV inhibitor and Alpha-glucose inhibitor are the most potential bioactive peptides. Compared with our results, DPP-IV inhibitor contained 95 to 387 active fragments, but it didn't contain any Alpha glucose inhibitor ( Sharmin K N et al., 2022).

For total frequency of bioactive peptides occurrence ( $\sum A$ ), Allophycocyanin beta chain had the highest value (table 4.4). The total frequency of occurrence,  $\sum A$  1.6459 of Allophycocyanin beta chain consists of  $A_{ACE}$  inhibitor of 0.5217,  $A_{DPP IV}$  inhibitor of 0.6522 ,  $A_{Alpha Glucose}$  inhibitor of

0.0124. Compared with the result, Phycocyanin alpha subunit and solute carrier protein contain the highest value  $\sum A$  1.472 (Sharmin K N *et al.*, 2022).

Thus, ACE inhibitor, DPP-IV inhibitor and Alpha glucose inhibitor are the major part of the occurrence of bioactive fragments and the study focuses on these activities.

DPP-IV (EC 3.4.1.4.5) is a serine protease that cleaves X-Pro or X-Ala dipeptides from the N terminus and is hence a dipeptidyl aminopeptidase. Insulinotropic action is lost when gastric inhibitory peptide and glucagon like peptide 1 are rapidly degraded and rendered inactive by dipeptidyl peptidase IV. Consequently, there is a therapeutic impact of inhibiting DPP IV activity on type 2 diabetes (Juillerat., 2013).

Compared with the results, it was found that ACE inhibitor activity in the *Caulerpa* genus showed promising results (Agirbasli Z *et al.*, 2017). Tocopherol acetyltransferase (ACE) inhibitor is the second most important peptide bioactivity in red algal proteins. Because of its position in the renin angiotensin system (RAS), it is crucial for regulation. In RAS, ACE converts angiotensin I to the active vasoconstrictor angiotensin II. One of the primary goals of hypertension prevention is to reduce ACE activity. Captopril and enalapril are examples of ACE inhibitors, a class of pharmaceutical medications commonly used to treat cardiovascular disease. They often cause cough, skin rashes as side effects. Natural ACE inhibitory peptides are a natural alternative to synthetic drugs.

### **5.3 In Silico proteolysis of red algae protein for phycocyanin**

Enzymatic hydrolysis is the most common method used to release biologically active peptide (Lin k *et al.*, 2018). Like its relatives allophycocyanin and phycoerythrin, phycocyanin is a pigment-protein complex that plays a role in photosynthesis. To investigate the potential bioactive peptides, a total of four protein sequences were selected (Table 4.5.1,4.5.2, 4.5.3). In the BIOPEP-UWM database, there are 33 types of enzyme, but in this study, six proteases (Chymotrypsin, Papain, pepsin, thermolysin, trypsin and stem bromelain) are chosen for the in-silico proteolysis as they are commercially available. Compared with the result it was found that three proteases papain, ficin, stem bromelain were utilized and stem bromelain showed the highest value (Sharmin K N *et al.*, 2022).

For the ACE Inhibitor, Chymotrypsin enzyme has Degree of Hydrolysis (DH) value higher in stem bromelain and papain enzyme. Pepsin and trypsin shows lower DH value ( Table 4.5.1). Like that, in DPP-IV inhibitor and Alpha-glucose contain lower DH value in the corporation with Pepsin and Trypsin enzyme (table 4.5.2, 4.5.3). In this study, stem bromelain shows the highest Degree of hydrolysis (DH).



Table 4.6 lists the in-silico enzymatically predicted peptides that block ACE, dipeptidyl peptidase IV, and alpha-glucosidase activity from red algal proteins. All of these peptides have been stored there in the database. Most of the reported peptides with the given activities are dipeptides, reported tripeptides are ASL, AEL, VAP, APG, LEE. In-silico proteolysis show that papain and stem bromelain are relatively potential to be released of bioactive peptides. After then, Novel peptides are screened for their potentiality. Compared with our result, it was found that the most reported peptide was only one single tripeptide (Sharmin K N *et al.*, 2021),

#### **5.4 Virtual Screening and Characterization of Novel peptide**

According to peptide ranker score, bioactive peptides with greater than or equal 0.5 have been prioritized. For the novel peptide analysis, we got 35 bioactive peptides. According to PeptideRanker scores, PYF and WYL are the most potential peptides among them. Both of the peptides are poor soluble in water, non allergic. They are predicted to be non toxic and their resistance to digestion is no. Their IC50 value (PYF=4.35 and WYL=5.20) shows their predicted potentiality. AC peptide is non toxic, non allergen and resistance to digestion is yes. Most of them are not resistance to digestion, 6 peptides are resistance to digestion, 16 peptides are good in solubility (table 4.7). Therefore, additional in vitro and in vivo study is needed to comprehend the true state of new peptides like these . We reported two most potential peptides for phycocyanin , while compared with our result it was found that *Caulerpa* sp from green algae showed several peptides as potential bioactive peptides (Garcia V M *et al.*, 2019) .

## **CHAPTER 6: CONCLUSION**

In conclusion, this in silico research showed that the most potential bioactivity from Phycocyanin proteins of different red algae were dipeptidyl peptidase-IV (DPP IV) and angiotensin-converting enzyme (ACE) inhibitors. Proteins called phycocyanins that are found in red algae, totaling 17, were selected for use as hypothetical peptide precursors in this computational study. Chymotrypsin, Papain, thermolysin, and stem bromelain were used for in-silico proteolysis. The potential of 42 tripeptides as new bioactive peptides was also investigated. Furthermore, bioinformatics tools such as PeptideRanker, PepCalc, Peptide Cutter, ToxinPred, AllerTop, and AHTpin were utilized to investigate the peptides' distinct characteristics. In silico bioinformative tools were confirming that the peptides might be predicted to be potential for in-vitro and in-vivo study. As a result of their therapeutic benefits on type 2 diabetes and antihypertensive activity, the phycocyanin proteins from red algae may be investigated further for use in the creation of functional food or pharmaceutical products.

## **CHAPTER 7: RECOMMENDATIONS & FUTURE PERSPECTIVES**

More study of the protein extract of the pyropia, Galdieria, Polysiphonia, and Neoporphyra plants is required before they may be used to create medications or functional food products with additional value. Potential directions for additional study include as follows:

- Potential bioactive peptides from different red algae should be studied, particularly as an ACE and DPP IV inhibitor.
- Exploring the red algae protein extract's potential as an alpha-glucosidase inhibitor, stimulant, anti-diabetic, and anti-microbial is a worthwhile next step in this field.
- Separation and purification of digestive enzymes from red algae protein extract is a viable area of research.
- The powdered form of red algae has to be studied for its physiochemical properties.
- The physicochemical features of red algal protein extract can be studied.
- The mechanism of ACE inhibition and the active ingredients of red algae or seaweed protein extract need more study.
- The feasibility of using seaweed as a human food source is an important topic for future study.
- Research needs to improve human health and the pharmaceutical industry's bottom line through product innovation.

## References:

- Abdul QA, Choi RJ, Jung HA and Choi JS (2016). Health benefit of fucosterol from marine algae: a review, *Journal of Science and Food Agriculture*, 96(6), pp.1856-66.
- Agirbasli Z and Cavas L (2017). In silico evaluation of bioactive peptides from the green algae *Caulerpa*. *Journal of Applied Phycology*, 29, pp. 1635–46.
- Aziz E, Batool R, Khan MU, Rauf A, Akhtar W, Heydari M, Rehman S, Shahzad T, Malik A, Mosavat SH, Plygun S and Shariat MA (2020). An overview on red algae bioactive compounds and their pharmaceutical applications. *Journal of Complementary and Integrative Medicine*, 17(4), pp. 201-203.
- Balasubramaniam V, June Chelyn L, Vimala S, Mohd Fairulnizal MN, Brownlee IA, Amin I (2020). Carotenoid composition and antioxidant potential of *Eucheuma denticulatum*, *Sargassum polycystum* and *Caulerpa lentillifera*. *Heliyon*, 6(8).
- Cao J, Wang J, Wang S and Xu X (2016). *Porphyra* species: A mini-review of its pharmacological and nutritional properties. *Journal of medicinal foods*, 19(2), pp. 111-119
- Capuano A, Sportiello L, Maiorino MI, Rossi F, Giugliano D. and Esposito K (2013). Dipeptidyl peptidase-4 inhibitors in type 2 diabetes therapy--focus on alogliptin. *Drug Design and development therapy*, (7), pp. 989-1001.
- Carpentier, S. C., Witters, E., Laukens, K., Deckers, P., Swennen, R., and Panis, B. (2005). Preparation of protein extracts from recalcitrant plant tissues: an evaluation of different methods for two-dimensional gel electrophoresis analysis. *Proteomics*, 5(10), 2497-2507.
- Carvalho C, Varela SAM, Marques TA, Knight A. and Vicente L (2020). Are in vitro and in silico approaches used appropriately for animal-based major depressive disorder research? *Plos One*, 15(6).
- Chabanon, G.; Chevalot, I.; Framboisier, X.; Chenu, S. and Marc, I., (2007). Hydrolysis of rapeseed protein isolates: Kinetics, characterization and functional properties of hydrolysates. *Process of Biochemistry*, (42), pp. 1419-1428.
- Chang, Y.W.; Hunag, B.B. and Lin, H.C (2015). Analysis of proteins and potential bioactive peptides from tilapia (*Oreochromis* spp.) processing co-products using proteomic techniques coupled with biopep database. *Journal of Functional Foods*, 19, pp. 629–640.

- Cheung I, Nakayama S, Hsu M, Samaranayaka A and Lichan E (2009). Angiotensin-I Converting Enzyme Inhibitory Activity of Hydrolysates from Oat (*Avena sativa*) Proteins by In Silico and In Vitro Analyses. *Journal of Agricultural and Food Chemistry*, 57 (19), pp. 9234-9242.
- Chiasson JL, Josse RG. and Gomis R. (2003). Acarbose treatment and the risk of cardiovascular disease and hypertension in patients with impaired glucose tolerance. The STOP-NIDDM trial, 290, pp. 486–94.
- Chiasson JL, Josse RG. and Gomis R. (2004). Acarbose for the prevention of Type 2 diabetes, hypertension and cardiovascular disease in subjects with impaired glucose tolerance: facts and interpretations concerning the critical analysis of the STOP-NIDDM Trial data. *Diabetologia*, 47, pp. 969–75.
- Dantas G, Kuhlman B, Callender D, Wong M and Baker D (2003), A Large Scale Test of Computational Protein Design: Folding and Stability of Nine Completely Redesigned Globular Proteins. *Journal of Molecular Biology*, 332 (2), pp. 449–60.
- del Mar Contreras, M., Lama-Muñoz, A., Gutiérrez-Pérez, J. M., Espínola, F., Moya, M., and Castro, E. (2019). Protein extraction from agri-food residues for integration in biorefinery: Potential techniques and current status. *Bioresource Technology*, 280, 459-477.
- Je, J. Y., Cho, Y. S., Gong, M., and Udenigwe, C. C. (2015). Dipeptide Phe-Cys derived from in silico thermolysin-hydrolysed RuBisCO large subunit suppresses oxidative stress in cultured human hepatocytes. *Food Chemistry*, 171, 287-291.
- Dziuba M., Minkiewicz P. and Dąbek M., (2013). Peptides, specific proteolysis products, as molecular markers of allergenic proteins – in silico studies. *Acta Scientiarum Polonorum Technologia Alimentaria*, 12(1), pp. 101-112.
- Fleurence J. (2009). Seaweed proteins: biochemical, nutritional aspects and potential uses. *Trends Food Science and Technology*, 10(1), pp. 25-28.
- Fleurence J (1999). The enzymatic degradation of algal cell walls: A useful approach for improving protein accessibility. *Journal of Applied Phycology*, 11, pp. 313–314.
- Forner, F., Foster, L. J., Campanaro, S., Valle, G., & Mann, M. (2006). Quantitative proteomic comparison of rat mitochondria from muscle, heart, and liver. *Molecular & Cellular Proteomics*, 5(4), 608-619.

- Gupta S, Kapoor P, Chaudhary K, Gautam A. and Kumar R (2013). In Silico Approach for Predicting Toxicity of Peptides and Protein. *PLOS ONE*, 8(9).
- Hagen Rødde RS, Vårum KM, Larsen BA. and Myklestad S. M. (2004). Seasonal and geographical variation in the chemical composition of the red alga *Palmaria palmata*. *Botanica Marina*, 47 (2), pp. 125-33.
- Kannel WB, Higgins M (1990). Smoking and hypertension as predictors of cardiovascular risk in population studies. *Journal of Hypertension*, 8, pp. 3–8.
- Klevytska, A. M., Price, L. B., Schupp, J. M., Worsham, P. L., Wong, J., & Keim, P. (2001). Identification and characterization of variable-number tandem repeats in the *Yersinia pestis* genome. *Journal of clinical microbiology*, 39(9), 3179-3185.
- Kuddus, M., Singh, P., Thomas, G., & Al-Hazimi, A. (2013). Recent developments in production and biotechnological applications of C-phycoerythrin. *BioMed Research International*.
- Lacroix, I.M.E.; Li-Chan and E.C.Y (2012). Evaluation of the potential of dietary proteins as precursors of dipeptidyl peptidase (DPP)-IV inhibitors by an in silico approach. *Journal of Functional Foods*, 4, pp. 403–422.
- Lafarga T, Connor P O and Hayes M (2014). Peptides Identification of novel dipeptidyl peptidase-IV and angiotensin-I-converting enzyme inhibitory peptides from meat proteins using in silico analysis. *Peptides*, 59, pp. 53-62.
- Lafarga T, Connor P O and Hayes M (2014). In silico methods to identify meat-derived prolyl endopeptidase inhibitors. *Food Chemistry*, 175, pp. 337-343.
- Lafarga T, Aluko R E, Rai D K, Connor P O and Hayes M (2016). Identification of bioactive peptides from a papain hydrolysate of bovine serum albumin and assessment of an antihypertensive effect in spontaneously hypertensive rats. *Food Research International*, 81, pp. 91-99
- Lafarga T., Acien-Fernandez, F.G., and Garcia-Vaquero, M. 2020. Bioactive peptides and carbohydrates from seaweed for food applications: Natural occurrence, isolation, purification, and identification. *Algal Research*.
- Li, C. M., Haratipour, P., Lingeman, R. G., Perry, J. J. P., Gu, L., Hickey, R. J., & Malkas, L. H. (2021). Novel peptide therapeutic approaches for cancer treatment. *Cells*, 10(11), 2908.
- Li GH, Le GW, Shi YH and Shrestha S (2013). Angiotensin I – converting enzyme inhibitory peptides derived from food proteins and their physiological and pharmacological effects. *Nutrition Resources*, 24, pp. 469–486.

- Minkiewicz P, Dziuba J, Iwaniak A, Dziuba M and Darewicz M (2008). BIOPEP Database and Other Programs for Processing Bioactive Peptide Sequences. *Journal of AOAC International*, 91, pp. 965–80.
- Minkiewicz, P., Iwaniak, A., and Darewicz, M. (2022). BIOPEP-UWM Virtual—A Novel Database of Food-Derived Peptides with In Silico-Predicted Biological Activity. *Applied Sciences*, 12(14), 7204.
- Newton, L. (1931). *A Handbook of the British Seaweeds*. British Museum.
- Nongonierma AB, FitzGerald RJ. (2019). Features of dipeptidyl peptidase IV (DPP-IV) inhibitory peptides from dietary proteins. *Journal of Food Biochemistry*, 43(1).
- Pinto AI. and Silveira NJ. (2020). In Silico Identification of Potential Inhibitors of the Wnt Signaling Pathway in Human Breast Cancer. *Journal of Computational Biology*, 27(7), pp. 999-1010.
- Pliego C, H.; Wijesekara, I.; Lang, M.; Bourgougnon, N. and Bedoux, G (2020). Current knowledge and challenges in extraction, characterization and bioactivity of seaweed protein and seaweed-derived proteins. *In Advances in Botanical Research*, 95, pp. 289–326.
- Pruitt K, Tatusova T and Maglott D (2005). NCBI Reference Sequence (RefSeq): a curated non-redundant sequence database of genomes, transcripts and proteins, *Nucleic Acids Research*, 33.
- Qiao L, Li B, Chen Y, Li L, Chen X, Wang L, Lu F, Luo G, Li G and Zhang Y (2016): Discovery of Anti-Hypertensive Oligopeptides from Adlay Based on In Silico Proteolysis and Virtual Screening. *International journal of Molecular Science*, 17, pp. 12-13.
- Roy A, Kucukural A and Zhang Y. (2010). I-TASSER: a unified platform for automated protein structure and function prediction. *Nature Protocols*, 5, 725-738.
- Sharmin K N, M A Amiza, F Ahmad, S A Razali and F Hashim (2022). In silico analysis of *Gracilaria changii* proteins for potential bioactive peptides. *IOP Conference Series: Earth and Environmental Science*, 967, pp. 6-10.
- Singh N, Upadhyay S, Jaiswar A and Mishra N (2016): In silico Analysis of Protein. *Journal of Bioinformatics, genomics and proteomics*, 1(2), pp.1007
- Taher R A, Bashir A, Yousuf M N, Ahmed A, Dali Y, Khan S and Sehgal S A (2020). In Silico identification of angiotensin-converting enzyme inhibitory peptides, *Plos One*, 15, pp. 1-18.

- Tejinder PK., Davender R. Suman D. and Jasbir S. (2015). In Silico Evaluation of Potential DPP-III Inhibitor Precursors from Dietary Proteins. *International Journal of Food Properties*, 18(3), pp. 499-507.
- Torres MM, Flórez-Fernández N. and Domínguez H (2018). Impact of counterions on the thermo-rheological features of hybrid carrageenan systems isolated from red seaweed *Gigartina skottsbergii*. *Food Hydrocolloids*, 84, pp. 321-29.
- Udenigwe, Chibuike C, Gong M and Wu S (2013). In silico analysis of the large and small subunits of cereal RuBisCO as precursors of cryptic bioactive peptides, *Process Biochemistry*, 48 (11), 1794-1799.
- Wang L., Qu Y., Fu X, Zhao M. and Wang S. (2014). Isolation, Purification and Properties of an R-Phycocyanin from the Phycobilisomes of a Marine Red Macroalga *Polysiphonia urceolata*. *Plos ONE*, 9(2).
- Wang, Y, Tibbetts S. and McGinn P. (2021). Microalgae as Sources of High-Quality Protein for Human Food and Protein Supplements. *Foods*, 10(12), pp. 3002.
- Wang, Z., Zhao, F. and Li, D. (2003). Determination of solubilization of phenol at coacervate phase of cloud point extraction. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 216(1-3), 207-214.
- Wachters RE, Priebe MG. and Heimweg JA, (2007). Low-dose acarbose does not delay digestion of starch but reduces its bioavailability. *Diabetic Medicine*, 24, pp. 600–606.
- W. J. Woelkerling (1990). An introduction of red algae. In K. M. Cole; R. G. Sheath (eds.). *Biology of the Red Algae*. Cambridge University Press, Cambridge. pp. 1–6.
- Zhang SY. and Sun HC (2007): Research progress on seaweed bed ecosystem and its engineering. *The Journal of Applied Ecology*, 18(7), pp. 1647-1653.



## Appendix

Profiles of proteins potential Biological activity for Allophycocyanin alpha chain (P59856)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	antiamnestic	2	PG
3257	beta-lactokinin	ACE inhibitor	2	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3388	ACE inhibitor	ACE inhibitor	1	MY
3538	ACE inhibitor	ACE inhibitor	1	VSP
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
3551	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	1	LF
3553	ACE inhibitor	ACE inhibitor	2	YG
3556	ACE inhibitor	ACE inhibitor	1	FY
3563	ACE inhibitor	ACE inhibitor	1	AY
7558	ACE inhibitor from buckwheat	ACE inhibitor	3	VK
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7585	ACE inhibitor	ACE inhibitor	1	LA
7586	ACE inhibitor	ACE inhibitor	1	KR
7591	ACE inhibitor	ACE inhibitor	1	GF
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	1	IG
7596	ACE inhibitor	ACE inhibitor	1	GI
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	1	GL
7600	ACE inhibitor	ACE inhibitor	3	AG
7606	ACE inhibitor	ACE inhibitor	1	DA
7608	ACE inhibitor	ACE inhibitor	3	GV
7610	ACE inhibitor	ACE inhibitor	2	GQ
7612	ACE inhibitor	ACE inhibitor	1	GT
7615	ACE inhibitor	ACE inhibitor	3	GE
7616	ACE inhibitor	ACE inhibitor	2	GG
7617	ACE inhibitor	ACE inhibitor	1	QG
7618	ACE inhibitor	ACE inhibitor	2	SG
7619	ACE inhibitor	ACE inhibitor	2	LG
7620	ACE inhibitor	ACE inhibitor	1	GD
7622	ACE inhibitor	ACE inhibitor	1	EG
7623	ACE inhibitor	ACE inhibitor	2	EA
7625	ACE inhibitor	ACE inhibitor	2	PG
7680	ACE inhibitor from pea vicilin	ACE inhibitor	1	QK
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7741	ACE inhibitor	ACE inhibitor	1	RR
7742	ACE inhibitor	ACE inhibitor	1	AR
7826	ACE inhibitor	ACE inhibitor	1	EI
7827	ACE inhibitor	ACE inhibitor	1	IE
7841	ACE inhibitor	ACE inhibitor	1	KE

9043	ACE inhibitor	ACE inhibitor	1	IAQ
9072	ACE inhibitor	ACE inhibitor	2	DY
9073	ACE inhibitor	ACE inhibitor	2	TP
9076	ACE inhibitor	ACE inhibitor	1	FQ
9079	ACE inhibitor	ACE inhibitor	1	IL
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9543	ACE inhibitor	ACE inhibitor	1	RYL
9944	ACE inhibitor	ACE inhibitor	1	ER
9946	ACE inhibitor	ACE inhibitor	1	YY
10043	ACE inhibitor	ACE inhibitor	1	ARY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10091	ACE inhibitor	ACE inhibitor	1	DR
3285	Antithrombotic peptide	antithrombotic	2	PG
2882	Immunostimulating peptide	immunomodulating	2	YG
3626		immunomodulating	1	KRP
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8322	Glucose uptake stimulating peptide	stimulating	4	IV
8323	Glucose uptake stimulating peptide	stimulating	1	IL
8326	Glucose uptake stimulating peptide	stimulating	1	LL
8329	Stimulating vasoactive substance release	stimulating	2	EE
2890	neuropeptide	neuropeptide	2	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2749	peptide regulating ion flow	regulating	2	DY
2754	peptide regulating the stomach mucosal membrane activity	regulating	2	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7866	peptide from Okara protein	antioxidative	1	AY
7888	antioxidative peptide	antioxidative	1	EL
7924	synthetic peptide	antioxidative	1	DYY
7941	synthetic peptide	antioxidative	1	YYL
8090	peptide derived from sardine muscle	antioxidative	1	MY
8219	antioxidative peptide	antioxidative	1	TY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
10051	Antioxidative peptide	antioxidative	1	RY
10052	Antioxidative peptide	antioxidative	1	RYL
4006	Ubiquitin-mediated proteolysis activating peptide	activating ubiquitin-mediated proteolysis	1	LA
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	VA
3175	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LA
3182	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LL

3183	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	TP
8505	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	SP
8518	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RP
8524	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GA
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IA
8531	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TA
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GL
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YT
8757	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	AD
8758	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	AE
8760	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	AG
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	AT
8765	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	AY
8766	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	DN
8769	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	DR
8770	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	EG
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	EI
8779	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	FQ
8781	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	GE
8782	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GF
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	GG
8785	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GI
8786	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	GV
8802	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IL

8808	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	KE
8814	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	KR
8815	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	KS
8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LT
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	LV
8831	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MK
8835	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MQ
8838	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MY
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	NA
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	NR
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	PG
8857	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	PI
8871	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QG
8873	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QI
8874	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QL
8876	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QQ
8884	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	RI
8886	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	RL
8889	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RR
8891	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	SF
8893	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	SI
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	SV
8898	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TD
8904	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TK
8905	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TL
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TY
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VG

8921	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	VK
8922	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VL
8924	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VN
8926	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VS
8927	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	VT
8935	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YF
8936	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	YG
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YN
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YY
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	2	EA
9695	Alpha-glucosidase inhibitor	alpha-glucosidase	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III	1	YF
9482	DPP-III inhibitor	dipeptidyl peptidase III	2	YL
9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9487	DPP-III inhibitor	dipeptidyl peptidase III	3	GE
9488	DPP-III inhibitor	dipeptidyl peptidase III	1	GF
9492	DPP-III inhibitor	dipeptidyl peptidase III	1	DA
9499	DPP-III inhibitor	dipeptidyl peptidase III	1	LA
9508	DPP-III inhibitor	dipeptidyl peptidase III	2	YG
2842	Renin inhibitor	renin inhibitor	3	LR
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF

Profiles of proteins potential Biological activity for C-phycoyanin beta chain (Q1XDB0)

ID	Name of peptide	Activity	Number	Sequence
3460	Prolyl endopeptidase inhibitor	antiamnestic	2	PG
3257	beta-lactokinin	ACE inhibitor	1	RL

3380	ACE inhibitor	ACE inhibitor	1	RY
3551	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	1	LF
3563	ACE inhibitor	ACE inhibitor	1	AY
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	2	IA
7583	ACE inhibitor	ACE inhibitor	1	AF
7585	ACE inhibitor	ACE inhibitor	1	LA
7586	ACE inhibitor	ACE inhibitor	1	KR
7588	ACE inhibitor	ACE inhibitor	2	RA
7589	ACE inhibitor	ACE inhibitor	1	YA
7590	ACE inhibitor	ACE inhibitor	2	AA
7596	ACE inhibitor	ACE inhibitor	1	GI
7599	ACE inhibitor	ACE inhibitor	1	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7606	ACE inhibitor	ACE inhibitor	3	DA
7607	ACE inhibitor	ACE inhibitor	2	GS
7612	ACE inhibitor	ACE inhibitor	1	GT
7615	ACE inhibitor	ACE inhibitor	1	GE
7616	ACE inhibitor	ACE inhibitor	1	GG
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	1	AI
7619	ACE inhibitor	ACE inhibitor	2	LG
7620	ACE inhibitor	ACE inhibitor	2	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7622	ACE inhibitor	ACE inhibitor	1	EG
7623	ACE inhibitor	ACE inhibitor	1	EA
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	2	PG
7635	ACE inhibitor from k-CN (fr. 51-53)	ACE inhibitor	1	VAV
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7680	ACE inhibitor from pea vicilin	ACE inhibitor	1	QK
7684	ACE inhibitor from garlic	ACE inhibitor	2	SY
7698	ACE inhibitor from wakame	ACE inhibitor	2	NK
7741	ACE inhibitor	ACE inhibitor	1	RR
7742	ACE inhibitor	ACE inhibitor	2	AR
7824	ACE inhibitor from micro algae	ACE inhibitor	1	IAE
7826	ACE inhibitor	ACE inhibitor	1	EI
7832	ACE inhibitor	ACE inhibitor	1	LN
7834	ACE inhibitor	ACE inhibitor	2	TQ
7837	ACE inhibitor	ACE inhibitor	1	PQ
7839	ACE inhibitor	ACE inhibitor	1	ME
7841	ACE inhibitor	ACE inhibitor	1	KE
8184	ACE Inhibitor	ACE inhibitor	1	IQP

8951	ACE inhibitor	ACE inhibitor	2	AV
9073	ACE inhibitor	ACE inhibitor	1	TP
9075	ACE inhibitor	ACE inhibitor	1	DM
9077	ACE inhibitor	ACE inhibitor	1	YV
9088	ACE inhibitor	ACE inhibitor	1	AEL
9173	ACE inhibitor	ACE inhibitor	1	RG
9213	ACE inhibitor	ACE inhibitor	3	LR
9566	ACE inhibitor	ACE inhibitor	2	QP
9942	ACE inhibitor	ACE inhibitor	1	EF
10091	ACE inhibitor	ACE inhibitor	2	DR
3285	Antithrombotic peptide	antithrombotic	2	PG
8320	Glucose uptake stimulating peptide	stimulating	2	VL
8322	Glucose uptake stimulating peptide	stimulating	2	IV
8324	Glucose uptake stimulating peptide	stimulating	2	LI
2754	peptide regulating the stomach mucosal membrane activity	regulating	2	PG
7866	peptide from Okara protein	antioxidative	1	AY
7888	antioxidative peptide	antioxidative	1	EL
8219	antioxidative peptide	antioxidative	1	TY
9879	Antioxidative peptide	antioxidative	1	SVL
10051	Antioxidative peptide	antioxidative	1	RY
10141	Hypotensive peptide	hypotensive	2	AA
4005		activating ubiquitin-mediated proteolysis	2	RA
4006	Ubiquitin-mediated proteolysis activating peptide	activating ubiquitin-mediated proteolysis	1	LA
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	4	VA
3173	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MA
3175	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LA
3176	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	FA
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TP
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	RA
8532	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QP

8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	5	AL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AA
8693	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IQP
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8758	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	AE
8759	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AF
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AS
8764	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AV
8765	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AY
8769	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	DR
8770	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EG
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8774	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ET
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GG
8785	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GI
8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IN
8805	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IQ
8808	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KE
8812	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KI
8814	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KR



8817	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KV
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LI
8823	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LN
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LT
8826	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ME
8830	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MI
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8832	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ML
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NA
8840	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ND
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NG
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NT
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	PG
8861	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PQ
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QG
8874	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QL
8882	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RG
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8889	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RR
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	5	SV
8897	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SY
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TG

8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TQ
8910	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TS
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TY
8922	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VL
8924	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VN
8925	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VQ
8926	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	VS
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VT
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YA
8935	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YF
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YV
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	EA
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9478	DPP-III inhibitor	dipeptidyl peptidase III	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III	1	YF
9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9492	DPP-III inhibitor	dipeptidyl peptidase III	3	DA
9499	DPP-III inhibitor	dipeptidyl peptidase III	1	LA
9500	DPP-III inhibitor	dipeptidyl peptidase III	2	FA
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9507	DPP-III inhibitor	dipeptidyl peptidase III i	1	SM
8250	CaMPDE inhibitor	CaMPDE inhibitor	1	EF
2842	Renin inhibitor	renin inhibitor	3	LR
8251	Renin inhibitor	renin inhibitor	1	EF
9433	Renin inhibitor	renin inhibitor	1	YA
9580	Hypolipidemic peptide	hypolipidemic	1	EF

Profiles of proteins potential Biological activity for C-phycoyanin alpha chain (Q1XDA9)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase	antiamnestic	1	PG
3461	Prolyl endopeptidase	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE Inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	2	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	3	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	3	IG
7598	ACE inhibitor	ACE inhibitor	3	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7614	ACE inhibitor	ACE inhibitor	1	HG
7615	ACE inhibitor	ACE inhibitor	1	GE
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7621	ACE inhibitor	ACE inhibitor	2	TG
7623	ACE inhibitor	ACE inhibitor	3	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR

7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	1	TE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7834	ACE inhibitor	ACE inhibitor	1	TQ
8382	ACE inhibitor	ACE inhibitor	1	RYQ
8968	ACE inhibitor	ACE inhibitor	1	ASL
9031	ACE inhibitor	ACE inhibitor	1	LEE
9035	ACE inhibitor	ACE inhibitor	1	GSH
9038	ACE inhibitor	ACE inhibitor	1	SVY
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	1	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	2	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9213	ACE inhibitor	ACE inhibitor	1	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9939	ACE inhibitor	ACE inhibitor	1	SVYT
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GYG
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	3	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL

7867	antioxidative peptide from Okara protein	antioxidative	1	GYG
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	2	VY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	2	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
9954	Antioxidative peptide	antioxidative	1	GSH
10009	Antioxidative peptide	antioxidative	1	SVYT
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti-inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP
3171	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MP
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VA
3174	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KA
3183	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VV
8503	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	GA
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IA
8526	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RA
8555	dipeptidyl peptidase IV	dipeptidyl peptidase IV	1	FL

8559	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AL
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	4	AA
8683	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AD
8760	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	AS
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AT
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EI
8777	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EY
8781	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GE
8788	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GY
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	IN
8809	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KF
8810	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KG
8816	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LI
8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LV
8831	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NA
8841	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NE

8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	NG
8847	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NN
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NR
8850	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NT
8851	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NV
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PI
8859	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PM
8862	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PS
8863	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PT
8866	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PY
8867	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QA
8871	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QG
8873	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QI
8877	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QS
8881	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QY
8886	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RM
8891	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SF
8892	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SH
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SV
8896	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TE
8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TG
8904	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TK

8905	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TL
8907	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TN
8908	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TQ
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TY
8916	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VE
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VG
8927	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	VT
8929	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	VY
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YA
8938	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YI
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	YL
8943	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YV
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
9117	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	3	EA
9693	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	GE
9490	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	VY



9510	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	KA
8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
10010	renin inhibitor	renin inhibitor	1	SVYT
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of proteins potential Biological activity for Allophycocyanin subunit beta-18 (Q1XDS1)

ID	Name of peptide	Activity	Number	Sequence
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3380	ACE inhibitor	ACE inhibitor	4	RY
3381	ACE inhibitor	ACE inhibitor	1	LY
3521	ACE inhibitor	ACE inhibitor	1	VAP
3543	ACE inhibitor	ACE inhibitor	1	LRP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7584	ACE inhibitor	ACE inhibitor	1	AP
7586	ACE inhibitor	ACE inhibitor	1	KR
7587	ACE inhibitor	ACE inhibitor	1	VP
7589	ACE inhibitor	ACE inhibitor	3	YA
7590	ACE inhibitor	ACE inhibitor	3	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7599	ACE inhibitor	ACE inhibitor	2	GL
7602	ACE inhibitor	ACE inhibitor	1	HL
7603	ACE inhibitor	ACE inhibitor	1	GR
7606	ACE inhibitor	ACE inhibitor	1	DA
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	2	SG
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	1	EA
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR

7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7684	ACE inhibitor from garlic	ACE inhibitor	2	SY
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7741	ACE inhibitor	ACE inhibitor	1	RR
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7824	ACE inhibitor from micro algae	ACE inhibitor	1	IAE
7826	ACE inhibitor	ACE inhibitor	2	EI
7827	ACE inhibitor	ACE inhibitor	2	IE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7832	ACE inhibitor	ACE inhibitor	2	LN
7833	ACE inhibitor	ACE inhibitor	1	PT
7841	ACE inhibitor	ACE inhibitor	1	KE
8227	ACE inhibitor	ACE inhibitor	1	IEY
8951	ACE inhibitor	ACE inhibitor	1	AV
9047	ACE inhibitor	ACE inhibitor	1	AQL
9076	ACE inhibitor	ACE inhibitor	1	FQ
9078	ACE inhibitor	ACE inhibitor	1	YE
9079	ACE inhibitor	ACE inhibitor	3	IL
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9543	ACE inhibitor	ACE inhibitor	1	RYL
9566	ACE inhibitor	ACE inhibitor	1	QP
9946	ACE inhibitor	ACE inhibitor	1	YY
10027	ACE inhibitor	ACE inhibitor	1	FF
10044	ACE inhibitor	ACE inhibitor	1	YLR
10091	ACE inhibitor	ACE inhibitor	1	DR
3285	Antithrombotic peptide	antithrombotic	1	PG
3351	Stimulating vasoactive substance release	stimulating	1	EEE
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	1	LV
8323	Glucose uptake stimulating peptide	stimulating	3	IL
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8325	Glucose uptake stimulating peptide	stimulating	3	II
8326	Glucose uptake stimulating peptide	stimulating	2	LL
8329	Stimulating vasoactive substance release	stimulating	3	EE
8330	Stimulating vasoactive substance release	stimulating	1	SE

2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
3317		antioxidative	1	HL
7872	peptide from soybean protein isolates: beta-conglycinin and glycinin	antioxidative	1	LY
7888	antioxidative peptide	antioxidative	2	EL
7927	synthetic peptide	antioxidative	1	EYY
7941	synthetic peptide	antioxidative	1	YYL
8134	peptide derived from dried bonito	antioxidative	1	KD
8139	Antioxidative peptide	antioxidative	1	PEL
8217	Antioxidative peptide	antioxidative	2	LK
8219	antioxidative peptide	antioxidative	1	TY
8484	Antioxidant peptide from as1-CN (98-100)	antioxidative	1	LLR
10051	Antioxidative peptide	antioxidative	4	RY
10052	Antioxidative peptide	antioxidative	1	RYL
10141	Hypotensive peptide	hypotensive	3	AA
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VA
3177	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AP
3181	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VP
3182	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LL
8518	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RP
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IA
8529	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EP
8531	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TA
8532	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QP
8557	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	HL
8559	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	AL
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SL

8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GL
8594	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VR
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	AA
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YT
8758	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AE
8762	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AS
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AT
8764	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AV
8768	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	DQ
8769	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	DR
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	EI
8773	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	ES
8777	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EY
8779	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FQ
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GG
8801	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	II
8802	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	IL
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IN
8805	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IQ
8808	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KE
8812	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KI
8814	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KR
8816	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LI
8823	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LN

8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LV
8835	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MQ
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NA
8840	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	ND
8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NG
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NR
8854	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PF
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PG
8863	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PT
8864	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PV
8867	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QA
8868	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QD
8869	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QE
8872	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QH
8874	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	QL
8877	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QS
8884	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RI
8889	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RR
8891	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SF
8893	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SI
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SV
8897	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SY
8898	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TD
8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TG

8907	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TN
8909	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TR
8911	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TT
8912	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TV
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TY
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VG
8922	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VL
8926	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VS
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	YA
8933	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YD
8934	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YE
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YN
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
10028	Inhibitor od Dipeptidyl Peptidase IV	dipeptidyl peptidase IV inhibitor	1	FF
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	EA
9694	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	PE
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YL
9485	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RR
9491	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RV
9492	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	DA
9493	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	HL
9504	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PE

9505	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PF
2842	Renin inhibitor	renin inhibitor	3	LR
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	3	YA
9470	Renin inhibitor	renin inhibitor	1	LY

Profiles of proteins potential biological activity for Phycocyanin alpha subunit (A0A141SF63)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3461	Prolyl endopeptidase inhibitor	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	2	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	3	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	3	IG
7598	ACE inhibitor	ACE inhibitor	3	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7614	ACE inhibitor	ACE inhibitor	1	HG

7615	ACE inhibitor	ACE inhibitor	1	GE
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7621	ACE inhibitor	ACE inhibitor	2	TG
7623	ACE inhibitor	ACE inhibitor	3	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	1	TE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7834	ACE inhibitor	ACE inhibitor	1	TQ
8382	ACE inhibitor from as2-CN (170-172)	ACE inhibitor	1	RYQ
8968	ACE inhibitor	ACE inhibitor	1	ASL
9031	ACE inhibitor	ACE inhibitor	1	LEE
9035	ACE inhibitor	ACE inhibitor	1	GSH
9038	ACE inhibitor	ACE inhibitor	1	SVY
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	1	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	2	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9213	ACE inhibitor	ACE inhibitor	1	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9939	ACE inhibitor	ACE inhibitor	1	SVYT
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GY Y
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI



8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	3	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GYG
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	2	VY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	2	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
9954	Antioxidative peptide	antioxidative	1	GSH
10009	Antioxidative peptide	antioxidative	1	SVYT
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP

3171	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MP
3172	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VA
3174	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KA
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RA
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	AA
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AT
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EY
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8788	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GY

8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IN
8809	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KF
8810	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KG
8816	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LI
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LV
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NA
8841	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NE
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NN
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NT
8851	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NV
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PI
8859	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PM
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PS
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PT
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PY
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QG
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QI

8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QS
8881	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QY
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8891	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SF
8892	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SH
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SV
8896	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TE
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TG
8904	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TK
8905	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TL
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TQ
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TY
8916	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VE
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VG
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VT
8929	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VY
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YA
8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	YL
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YV
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YY

9117	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	3	EA
9693	Alpha-glucosidase	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III	3	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9490	DPP-III inhibitor	dipeptidyl peptidase III	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III	2	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III	1	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III	1	KA
8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
10010	renin inhibitor	renin inhibitor	1	SVYT
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of proteins potential biological activity for Phycocyanin alpha subunit (A0A1U6ZGH2)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3461	Prolyl endopeptidase	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	2	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	3	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY

7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	3	IG
7598	ACE inhibitor	ACE inhibitor	3	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7614	ACE inhibitor	ACE inhibitor	1	HG
7615	ACE inhibitor	ACE inhibitor	1	GE
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7621	ACE inhibitor	ACE inhibitor	2	TG
7623	ACE inhibitor	ACE inhibitor	3	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	1	TE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7834	ACE inhibitor	ACE inhibitor	1	TQ
8382	ACE inhibitor from as2-CN (170-172)	ACE inhibitor	1	RYQ
8968	ACE inhibitor	ACE inhibitor	1	ASL
9031	ACE inhibitor	ACE inhibitor	1	LEE
9035	ACE inhibitor	ACE inhibitor	1	GSH
9038	ACE inhibitor	ACE inhibitor	1	SVY
9052	ACE inhibitor	ACE inhibitor	1	GPM

9072	ACE inhibitor	ACE inhibitor	1	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	2	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9213	ACE inhibitor	ACE inhibitor	1	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9939	ACE inhibitor	ACE inhibitor	1	SVYT
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GY Y
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	3	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GY Y
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	2	VY
8453	Antioxidant peptide from marine bivalve ( <i>Mactra veneriformis</i> )	antioxidative	1	LDY

8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	2	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
9954	Antioxidative peptide	antioxidative	1	GSH
10009	Antioxidative peptide	antioxidative	1	SVYT
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP
3171	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MP
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VA
3174	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KA
3183	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VV
8503	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RA
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL



8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	AA
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AT
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EY
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8788	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GY
8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IN
8809	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KF
8810	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KG
8816	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LI
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LV
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NA

8841	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NE
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NN
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NT
8851	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NV
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PI
8859	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PM
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PS
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PT
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PY
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QG
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QI
8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QS
8881	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QY
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8891	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SF
8892	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SH
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SV
8896	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TE
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TG

8904	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TK
8905	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TL
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TQ
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TY
8916	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VE
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VG
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VT
8929	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VY
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YA
8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	YL
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YV
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YY
9117	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	3	EA
9693	Alpha-glucosidase	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III	3	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9490	DPP-III inhibitor	dipeptidyl peptidase III	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III	2	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III	1	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III	1	KA
8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR

8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
10010	renin inhibitor	renin inhibitor	1	SVYT
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of proteins potential Biological activity for Phycocyanin alpha subunit (D6QTA1)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3461	Prolyl endopeptidase	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	2	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	3	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	3	IG
7598	ACE inhibitor	ACE inhibitor	3	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7614	ACE inhibitor	ACE inhibitor	1	HG
7615	ACE inhibitor	ACE inhibitor	1	GE
7617	ACE inhibitor	ACE inhibitor	1	QG

8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7621	ACE inhibitor	ACE inhibitor	2	TG
7623	ACE inhibitor	ACE inhibitor	3	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	1	TE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7834	ACE inhibitor	ACE inhibitor	1	TQ
8382	ACE inhibitor from as2-CN (170-172)	ACE inhibitor	1	RYQ
8968	ACE inhibitor	ACE inhibitor	1	ASL
9031	ACE inhibitor	ACE inhibitor	1	LEE
9035	ACE inhibitor	ACE inhibitor	1	GSH
9038	ACE inhibitor	ACE inhibitor	1	SVY
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	1	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	2	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9213	ACE inhibitor	ACE inhibitor	1	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9939	ACE inhibitor	ACE inhibitor	1	SVYT
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GY Y
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI

8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	3	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GYG
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	2	VY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	2	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
9954	Antioxidative peptide	antioxidative	1	GSH
10009	Antioxidative peptide	antioxidative	1	SVYT
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP

3171	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MP
3172	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VA
3174	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KA
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RA
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	AA
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AT
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EY
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8788	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GY

8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IN
8809	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KF
8810	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KG
8816	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LI
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LV
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NA
8841	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NE
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NN
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NT
8851	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NV
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PI
8859	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PM
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PS
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PT
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PY
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QG
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QI



8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QS
8881	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QY
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8891	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SF
8892	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SH
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SV
8896	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TE
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TG
8904	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TK
8905	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TL
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TQ
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TY
8916	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VE
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VG
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VT
8929	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VY
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YA
8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	YL
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YV
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YY

9117	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	3	EA
9693	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	GE
9490	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	KA
8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
10010	renin inhibitor	renin inhibitor	1	SVYT
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of proteins potential Biological activity for Allophycocyanin beta-18 subunit ( A0A059XHS0 )

ID	Name of peptide	Activity	Number	Sequence
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3380	ACE inhibitor	ACE inhibitor	4	RY
3381	ACE inhibitor	ACE inhibitor	1	LY
3521	ACE inhibitor	ACE inhibitor	1	VAP
3543	ACE inhibitor	ACE inhibitor	1	LRP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7584	ACE inhibitor	ACE inhibitor	1	AP

7587	ACE inhibitor	ACE inhibitor	1	VP
7589	ACE inhibitor	ACE inhibitor	3	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7599	ACE inhibitor	ACE inhibitor	2	GL
7602	ACE inhibitor	ACE inhibitor	1	HL
7603	ACE inhibitor	ACE inhibitor	1	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7606	ACE inhibitor	ACE inhibitor	1	DA
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	2	SG
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	1	EA
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7684	ACE inhibitor from garlic	ACE inhibitor	2	SY
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7741	ACE inhibitor	ACE inhibitor	1	RR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7824	ACE inhibitor from micro algae	ACE inhibitor	1	IAE
7826	ACE inhibitor	ACE inhibitor	2	EI
7827	ACE inhibitor	ACE inhibitor	2	IE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7832	ACE inhibitor	ACE inhibitor	2	LN
7833	ACE inhibitor	ACE inhibitor	1	PT
7841	ACE inhibitor	ACE inhibitor	1	KE
8227	ACE inhibitor	ACE inhibitor	1	IEY
8951	ACE inhibitor	ACE inhibitor	1	AV
9047	ACE inhibitor	ACE inhibitor	1	AQL
9076	ACE inhibitor	ACE inhibitor	1	FQ
9078	ACE inhibitor	ACE inhibitor	1	YE
9079	ACE inhibitor	ACE inhibitor	3	IL
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9543	ACE inhibitor	ACE inhibitor	1	RYL
9566	ACE inhibitor	ACE inhibitor	1	QP

9946	ACE inhibitor	ACE inhibitor	1	YY
10027	ACE inhibitor	ACE inhibitor	1	FF
10044	ACE inhibitor	ACE inhibitor	1	YLR
10091	ACE inhibitor	ACE inhibitor	1	DR
3285	Antithrombotic peptide	antithrombotic	1	PG
3351	Stimulating vasoactive substance release	stimulating	1	EEE
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	1	LV
8323	Glucose uptake stimulating peptide	stimulating	3	IL
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8325	Glucose uptake stimulating peptide	stimulating	3	II
8326	Glucose uptake stimulating peptide	stimulating	2	LL
8329	Stimulating vasoactive substance release	stimulating	3	EE
8330	Stimulating vasoactive substance release	stimulating	1	SE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
3317		antioxidative	1	HL
7872	peptide from soybean protein isolates: beta-conglycinin and glycinin	antioxidative	1	LY
7888	antioxidative peptide	antioxidative	2	EL
7927	synthetic peptide	antioxidative	1	EYY
7941	synthetic peptide	antioxidative	1	YYL
8134	peptide derived from dried bonito	antioxidative	2	KD
8139	Antioxidative peptide	antioxidative	1	PEL
8217	Antioxidative peptide	antioxidative	2	LK
8219	antioxidative peptide	antioxidative	1	TY
8484	Antioxidant peptide from as1-CN (98-100)	antioxidative	1	LLR
10051	Antioxidative peptide	antioxidative	4	RY
10052	Antioxidative peptide	antioxidative	1	RYL
10141	Hypotensive peptide	hypotensive	4	AA
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VA

3174	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KA
3177	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AP
3181	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VP
3182	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LL
8518	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RP
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IA
8529	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EP
8531	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TA
8532	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QP
8557	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	HL
8559	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	AL
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GL
8594	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VR
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	4	AA
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YT
8758	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AE
8762	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AS
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AT
8764	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AV
8768	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	DQ
8769	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	DR
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	EI
8773	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	ES
8777	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EY

8779	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FQ
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GG
8801	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	II
8802	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	IL
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IN
8805	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IQ
8808	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KE
8810	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KG
8812	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KI
8821	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LI
8823	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LN
8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LV
8835	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MQ
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NA
8840	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	ND
8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NG
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NR
8854	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PF
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PG
8863	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PT
8864	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PV
8867	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QA
8868	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QD
8869	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QE

8872	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QH
8874	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	QL
8877	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QS
8884	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RI
8889	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RR
8891	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SF
8893	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SI
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SV
8897	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SY
8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TG
8907	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TN
8909	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TR
8911	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TT
8912	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TV
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TY
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VG
8922	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VL
8926	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VS
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	YA
8933	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YD
8934	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YE
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YN
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
10028	Inhibitor od Dipeptidyl Peptidase IV	dipeptidyl peptidase IV inhibitor	1	FF

9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	EA
9694	Alpha-glucosidase inhibitor	alpha-glucosidase	1	PE
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YL
9485	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RR
9491	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RV
9492	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	DA
9493	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	HL
9504	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PE
9505	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PF
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	KA
2842	Renin inhibitor	renin inhibitor	3	LR
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	3	YA
9470	Renin inhibitor	renin inhibitor	1	LY

Profiles of proteins potential biological activity for Allophycocyanin beta chain (A0A059XHV7)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	anti-amnesic	1	PG
3461	Prolyl endopeptidase inhibitor	anti-amnesic	1	GP
3258	beta-lactokinin	ACE inhibitor	1	IR
3380	ACE inhibitor	ACE inhibitor	2	RY
3381	ACE inhibitor	ACE inhibitor	2	LY
3388	ACE inhibitor	ACE inhibitor	1	MY
3532	ACE inhibitor	ACE inhibitor	1	GY
3550	ACE inhibitor	ACE inhibitor	2	YL
3553	ACE inhibitor	ACE inhibitor	1	YG
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	1	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7585	ACE inhibitor	ACE inhibitor	2	LA
7587	ACE inhibitor	ACE inhibitor	1	VP



7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	6	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	1	IG
7597	ACE inhibitor	ACE inhibitor	1	GM
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	3	GL
7600	ACE inhibitor	ACE inhibitor	2	AG
7606	ACE inhibitor	ACE inhibitor	2	DA
7608	ACE inhibitor	ACE inhibitor	1	GV
7609	ACE inhibitor	ACE inhibitor	1	MG
7611	ACE inhibitor	ACE inhibitor	2	GK
7615	ACE inhibitor	ACE inhibitor	1	GE
7616	ACE inhibitor	ACE inhibitor	1	GG
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7620	ACE inhibitor	ACE inhibitor	1	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7691	ACE inhibitor from wakame	ACE inhibitor	1	KY
7693	ACE inhibitor from wakame	ACE inhibitor	1	KL
7741	ACE inhibitor	ACE inhibitor	1	RR
7828	ACE inhibitor	ACE inhibitor	1	EV
7829	ACE inhibitor	ACE inhibitor	1	VE
7832	ACE inhibitor	ACE inhibitor	1	LN
7840	ACE inhibitor	ACE inhibitor	1	EK
7841	ACE inhibitor	ACE inhibitor	4	KE
9031	ACE inhibitor	ACE inhibitor	1	LEE
9033	ACE inhibitor	ACE inhibitor	1	GLY
9069	ACE inhibitor	ACE inhibitor	1	VGP
9072	ACE inhibitor	ACE inhibitor	2	DY
9076	ACE inhibitor	ACE inhibitor	1	FQ
9079	ACE inhibitor	ACE inhibitor	2	IL
9173	ACE inhibitor	ACE inhibitor	1	RG
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9326	ACE inhibitor	ACE inhibitor	1	LGV
9327	ACE inhibitor	ACE inhibitor	1	RVR

9944	ACE inhibitor	ACE inhibitor	1	ER
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10167	ACE inhibitor	ACE inhibitor	1	LLY
3283	Antithrombotic peptide	antithrombotic	1	GP
3285	Antithrombotic peptide	antithrombotic	1	PG
2882	Immunostimulating peptide	immunomodulating	1	YG
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	1	LV
8323	Glucose uptake stimulating peptide	stimulating	2	IL
8325	Glucose uptake stimulating peptide	stimulating	1	II
8326	Glucose uptake stimulating peptide	stimulating	1	LL
8329	Stimulating vasoactive substance release	stimulating	1	EE
3065	fragment of bovine beta-casein 191-193	immunostimulating	1	LLY
8310	Anxiolytic peptide	neuropeptide	2	YL
2739	Peptide regulating phosphoinositol metabolism	regulating	1	GLY
2749	peptide regulating ion flow	regulating	2	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	1	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	3	SL
7872	peptide from soybean protein isolates: beta-conglycinin and glycinin	antioxidative	2	LY
7888	antioxidative peptide	antioxidative	1	EL
7924	synthetic peptide	antioxidative	1	DYY
7941	synthetic peptide	antioxidative	1	YYL
8090	peptide derived from sardine muscle	antioxidative	1	MY
8215	Antioxidative peptide	antioxidative	1	IR
8217	Antioxidative peptide	antioxidative	1	LK
8219	antioxidative peptide	antioxidative	2	TY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
9366	Antioxidative peptide	antioxidative	1	KYL
10051	Antioxidative peptide	antioxidative	2	RY
10168	Antioxidative peptide	antioxidative	1	LLY
10141	Hypotensive peptide	hypotensive	6	AA

4005		activating ubiquitin-mediated proteolysis	1	RA
4006	Ubiquitin-mediated proteolysis activating peptide	activating ubiquitin-mediated proteolysis	2	LA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GP
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VA
3175	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	LA
3181	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VP
3182	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LL
8518	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RP
8524	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GA
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IA
8526	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RA
8558	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	EK
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	GL
8594	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VR
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	6	AA
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YT
8757	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	AD
8760	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	AG
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	4	AT
8767	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	DP
8773	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	ES
8774	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	ET

8775	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	EV
8779	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	FQ
8781	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GE
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GG
8786	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GV
8788	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	GY
8801	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	II
8802	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	IL
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IN
8805	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IQ
8806	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	IR
8808	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	4	KE
8815	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	KS
8819	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	KY
8823	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LN
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	LV
8828	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MG
8831	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MK
8832	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	ML
8835	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MQ
8838	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	MY
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	NA
8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	NG
8846	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	NM
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	PG

8857	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	PI
8862	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	PS
8867	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QA
8868	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QD
8871	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QG
8878	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	QT
8882	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RG
8889	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	RR
8893	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	SI
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	3	SV
8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TG
8903	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	4	TI
8909	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	TR
8910	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TS
8911	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	TT
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	TY
8916	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VE
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VG
8920	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VI
8922	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VL
8925	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VQ
8927	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	VT
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	YA
8935	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	YF

8936	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YG
8938	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YI
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YN
8945	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV	1	YS
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
9693	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III	2	YF
9482	DPP-III inhibitor	dipeptidyl peptidase III	2	YL
9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9491	DPP-III inhibitor	dipeptidyl peptidase III	2	RV
9492	DPP-III inhibitor	dipeptidyl peptidase III	2	DA
9499	DPP-III inhibitor	dipeptidyl peptidase III	2	LA
9508	DPP-III inhibitor	dipeptidyl peptidase III	1	YG
9510	DPP-III inhibitor	dipeptidyl peptidase III	1	YI
8247	CaMPDE inhibitor	CaMPDE inhibitor	1	IR
2842	Renin inhibitor	renin inhibitor	3	LR
8246	renin inhibitor	renin inhibitor	1	IR
9433	Renin inhibitor	renin inhibitor	2	YA
9470	Renin inhibitor	renin inhibitor	2	LY

Profiles of proteins potential Biological activity for Allophycocyanin beta-18 subunit (A0A059XLB0)

ID	Name of peptide	Activity	Number	Sequence
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3380	ACE inhibitor	ACE inhibitor	4	RY
3381	ACE inhibitor	ACE inhibitor	1	LY
3521	ACE inhibitor	ACE inhibitor	1	VAP
3543	ACE inhibitor	ACE inhibitor	1	LRP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7584	ACE inhibitor	ACE inhibitor	1	AP
7587	ACE inhibitor	ACE inhibitor	1	VP
7589	ACE inhibitor	ACE inhibitor	3	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7599	ACE inhibitor	ACE inhibitor	2	GL
7602	ACE inhibitor	ACE inhibitor	1	HL
7603	ACE inhibitor	ACE inhibitor	1	GR
7606	ACE inhibitor	ACE inhibitor	1	DA
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	2	SG
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	1	EA
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7684	ACE inhibitor from garlic	ACE inhibitor	2	SY
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7741	ACE inhibitor	ACE inhibitor	1	RR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7824	ACE inhibitor from micro algae	ACE inhibitor	1	IAE
7826	ACE inhibitor	ACE inhibitor	2	EI
7827	ACE inhibitor	ACE inhibitor	3	IE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7832	ACE inhibitor	ACE inhibitor	2	LN
7833	ACE inhibitor	ACE inhibitor	1	PT

7841	ACE inhibitor	ACE inhibitor	1	KE
8227	ACE inhibitor	ACE inhibitor	1	IEY
8951	ACE inhibitor	ACE inhibitor	1	AV
9045	ACE inhibitor	ACE inhibitor	1	IVQ
9047	ACE inhibitor	ACE inhibitor	1	AQL
9076	ACE inhibitor	ACE inhibitor	1	FQ
9078	ACE inhibitor	ACE inhibitor	1	YE
9079	ACE inhibitor	ACE inhibitor	3	IL
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9543	ACE inhibitor	ACE inhibitor	1	RYL
9566	ACE inhibitor	ACE inhibitor	1	QP
9946	ACE inhibitor	ACE inhibitor	1	YY
10027	ACE inhibitor	ACE inhibitor	1	FF
10044	ACE inhibitor	ACE inhibitor	1	YLR
10091	ACE inhibitor	ACE inhibitor	1	DR
3285	Antithrombotic peptide	antithrombotic	1	PG
3351	Stimulating vasoactive substance release	stimulating	1	EEE
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8322	Glucose uptake stimulating peptide	stimulating	1	IV
8323	Glucose uptake stimulating peptide	stimulating	3	IL
8324	Glucose uptake stimulating peptide	stimulating	2	LI
8325	Glucose uptake stimulating peptide	stimulating	2	II
8326	Glucose uptake stimulating peptide	stimulating	2	LL
8329	Stimulating vasoactive substance release	stimulating	3	EE
8330	Stimulating vasoactive substance release	stimulating	1	SE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
3317		antioxidative	1	HL
7872	peptide from soybean protein isolates: beta-conglycinin and glycinin	antioxidative	1	LY
7888	antioxidative peptide	antioxidative	2	EL
7927	synthetic peptide	antioxidative	1	EYY
7941	synthetic peptide	antioxidative	1	YYL



8134	peptide derived from dried bonito	antioxidative	2	KD
8139	Antioxidative peptide	antioxidative	1	PEL
8217	Antioxidative peptide	antioxidative	2	LK
8219	antioxidative peptide	antioxidative	1	TY
8484	Antioxidant peptide from asI-CN (98-100)	antioxidative	1	LLR
10051	Antioxidative peptide	antioxidative	4	RY
10052	Antioxidative peptide	antioxidative	1	RYL
10141	Hypotensive peptide	hypotensive	4	AA
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VA
3174	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KA
3177	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AP
3181	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VP
3182	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LL
8518	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RP
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IA
8529	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EP
8531	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TA
8532	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QP
8557	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	HL
8559	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	AL
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GL
8594	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VR
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	4	AA
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YT
8758	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AE
8762	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AS
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AT
8764	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AV

8768	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	DQ
8769	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	DR
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	EI
8773	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	ES
8777	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EY
8779	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FQ
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GG
8801	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	II
8802	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	IL
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IN
8805	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IQ
8808	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KE
8812	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KI
8821	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LI
8823	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LN
8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LT
8835	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MQ
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NA
8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NG
8847	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NN
8848	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NQ
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NR
8854	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PF
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PG
8863	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PT
8864	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PV
8867	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QA

8868	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QD
8869	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QE
8872	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QH
8873	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QI
8874	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	QL
8877	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QS
8884	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RI
8885	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RK
8889	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RR
8891	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SF
8893	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SI
8895	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SV
8897	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	SY
8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TG
8907	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TN
8909	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TR
8911	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TT
8912	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TV
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TY
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VG
8922	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VL
8925	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VQ
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	YA
8933	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YD
8934	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YE
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YN

8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
10028	Inhibitor od Dipeptidyl Peptidase IV	dipeptidyl peptidase IV inhibitor	1	FF
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	EA
9694	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	PE
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YL
9485	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RR
9491	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RV
9492	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	DA
9493	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	HL
9504	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PE
9505	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PF
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	KA
2842	Renin inhibitor	renin inhibitor	3	LR
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	3	YA
9470	Renin inhibitor	renin inhibitor	1	LY

Profiles of proteins potential Biological activity for Phycocyanin alpha subunit (A0A6F8SI63)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase	antiamnestic	1	PG
3461	Prolyl endopeptidase	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	2	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	3	YL

3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	3	IG
7598	ACE inhibitor	ACE inhibitor	3	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7604	ACE inhibitor	ACE inhibitor	1	KG
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7614	ACE inhibitor	ACE inhibitor	1	HG
7615	ACE inhibitor	ACE inhibitor	1	GE
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7621	ACE inhibitor	ACE inhibitor	2	TG
7623	ACE inhibitor	ACE inhibitor	3	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7685	ACE from garlic	ACE inhibitor	1	SF
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	1	TE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7834	ACE inhibitor	ACE inhibitor	1	TQ
8382	ACE inhibitor from as2-CN (170-172)	ACE inhibitor	1	RYQ
8968	ACE inhibitor	ACE inhibitor	1	ASL
9031	ACE inhibitor	ACE inhibitor	1	LEE
9035	ACE inhibitor	ACE inhibitor	1	GSH
9038	ACE inhibitor	ACE inhibitor	1	SVY
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	1	DY

9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	2	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9213	ACE inhibitor	ACE inhibitor	1	LR
9228	ACE Inhibitor	ACE inhibitor	1	LDY
9939	ACE inhibitor	ACE inhibitor	1	SVYT
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GY Y
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	3	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GY Y
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	2	VY
8453	Antioxidant peptide from marine bivalve ( <i>Macra veneriformis</i> )	antioxidative	1	LDY
8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	2	GAA

9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
9954	Antioxidative peptide	antioxidative	1	GSH
10009	Antioxidative peptide	antioxidative	1	SVYT
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	GP
3171	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MP
3172	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VA
3174	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KA
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TP
8505	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SP
8506	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	FP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RA
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	4	AA
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	WY

8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AD
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AT
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EI
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EY
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GE
8788	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GY
8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	IN
8809	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KF
8810	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KG
8816	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KT
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LI
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	LV
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MK
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NA
8841	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NE
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NN
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NT



8851	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NV
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PI
8859	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PM
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PS
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PT
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PY
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QG
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QI
8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QS
8881	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QY
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RM
8891	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SF
8892	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SH
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SV
8896	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SW
8899	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TE
8901	dipeptidyl peptidase IV	dipeptidyl peptidase IV	2	TG
8904	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TK
8905	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TL
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TQ

8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	TY
8916	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VE
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VG
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VT
8929	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VY
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	YA
8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	YL
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	YV
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YY
9117	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase	3	EA
9693	Alpha-glucosidase inhibitor	alpha-glucosidase	1	VE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III	3	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9490	DPP-III inhibitor	dipeptidyl peptidase III	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III	2	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III	1	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III	1	KA
8249	CaMPDE inhibitor	CaMPDE	1	KF

2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
10010	renin inhibitor	renin inhibitor	1	SVYT
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of potential biological activity for Allophycocyanin beta-18 subunit (A0A023HQS5)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	anti-amnestic	1	PG
3380	ACE inhibitor	ACE inhibitor	4	RY
3381	ACE inhibitor	ACE inhibitor	1	LY
3543	ACE inhibitor	ACE inhibitor	1	LRP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
7558	ACE inhibitor from buckwheat	ACE inhibitor	1	VK
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	2	IA
7582	ACE inhibitor	ACE inhibitor	1	RP
7584	ACE inhibitor	ACE inhibitor	1	AP
7587	ACE inhibitor	ACE inhibitor	1	VP
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	3	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7599	ACE inhibitor	ACE inhibitor	2	GL
7602	ACE inhibitor	ACE inhibitor	1	HL
7603	ACE inhibitor	ACE inhibitor	1	GR
7606	ACE inhibitor	ACE inhibitor	1	DA
7607	ACE inhibitor	ACE inhibitor	1	GS
7610	ACE inhibitor	ACE inhibitor	1	GQ
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	2	SG
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	1	EA
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR
7635	ACE inhibitor from k-CN (fr. 51-53)	ACE inhibitor	1	VAV

7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7684	ACE inhibitor from garlic	ACE inhibitor	2	SY
7685	ACE inhibitor from garlic	ACE inhibitor	1	SF
7741	ACE inhibitor	ACE inhibitor	1	RR
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7819	ACE inhibitor from wheat gliadin	ACE inhibitor	1	IAP
7824	ACE inhibitor from micro algae	ACE inhibitor	1	IAE
7826	ACE inhibitor	ACE inhibitor	2	EI
7827	ACE inhibitor	ACE inhibitor	4	IE
7831	ACE inhibitor	ACE inhibitor	2	LQ
7832	ACE inhibitor	ACE inhibitor	2	LN
7833	ACE inhibitor	ACE inhibitor	1	PT
7841	ACE inhibitor	ACE inhibitor	1	KE
8227	ACE inhibitor	ACE inhibitor	1	IEY
8951	ACE inhibitor	ACE inhibitor	1	AV
9047	ACE inhibitor	ACE inhibitor	1	AQL
9076	ACE inhibitor	ACE inhibitor	1	FQ
9078	ACE inhibitor	ACE inhibitor	1	YE
9079	ACE inhibitor	ACE inhibitor	3	IL
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	3	LR
9543	ACE inhibitor	ACE inhibitor	1	RYL
9566	ACE inhibitor	ACE inhibitor	1	QP
9944	ACE inhibitor	ACE inhibitor	2	ER
9946	ACE inhibitor	ACE inhibitor	1	YY
10027	ACE inhibitor	ACE inhibitor	1	FF
10044	ACE inhibitor	ACE inhibitor	1	YLR
3285	Antithrombotic peptide	antithrombotic	1	PG
3351	Stimulating vasoactive substance release	stimulating	1	EEE
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	1	LV
8323	Glucose uptake stimulating peptide	stimulating	3	IL
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8325	Glucose uptake stimulating peptide	stimulating	3	II
8326	Glucose uptake stimulating peptide	stimulating	2	LL

8329	Stimulating vasoactive substance release	stimulating	3	EE
8330	Stimulating vasoactive substance release	stimulating	1	SE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
3317		antioxidative	1	HL
7872	peptide from soybean protein isolates: beta-conglycinin and glycinin	antioxidative	1	LY
7888	antioxidative peptide	antioxidative	2	EL
7927	synthetic peptide	antioxidative	1	EYY
7941	synthetic peptide	antioxidative	1	YYL
8134	peptide derived from dried bonito	antioxidative	2	KD
8139	Antioxidative peptide	antioxidative	1	PEL
8217	Antioxidative peptide	antioxidative	2	LK
8219	antioxidative peptide	antioxidative	1	TY
8484	Antioxidant peptide from asI-CN (98-100)	antioxidative	1	LLR
10051	Antioxidative peptide	antioxidative	4	RY
10052	Antioxidative peptide	antioxidative	1	RYL
10141	Hypotensive peptide	hypotensive	3	AA
3172	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VA
3177	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AP
3181	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VP
3182	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	LL
8518	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RP
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	IA
8529	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EP
8531	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TA
8532	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QP

8557	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	HL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	GL
8594	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VR
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	AA
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	YT
8758	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AE
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AT
8764	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AV
8768	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	DQ
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	EI
8773	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	ES
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EY
8779	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	FQ
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GG
8801	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	II
8802	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	IL
8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	IN
8805	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	IQ
8808	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KE
8812	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KI
8817	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KV
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LI
8823	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	LN

8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LV
8835	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MQ
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NA
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NN
8848	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NQ
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NR
8854	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PF
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PI
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PT
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QA
8868	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QD
8869	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QE
8872	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QH
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QI
8874	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QL
8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	QS
8885	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RK
8889	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RR
8891	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SF
8893	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	SI
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SV

8897	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	SY
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TG
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	TN
8909	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TR
8910	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TS
8911	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TT
8912	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TV
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TY
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VG
8921	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VK
8922	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VL
8926	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VS
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	YA
8933	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YD
8934	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YE
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	YL
8942	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YN
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YY
10028	Inhibitor od Dipeptidyl Peptidase IV	dipeptidyl peptidase IV	1	FF
9650	Alpha-glucosidase inhibitor	alpha-glucosidase	1	EA
9694	Alpha-glucosidase inhibitor	alpha-glucosidase	1	PE
9476	DPP-III inhibitor	dipeptidyl peptidase III	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	3	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III	2	YL



9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9491	DPP-III inhibitor	dipeptidyl peptidase III	2	RV
9492	DPP-III inhibitor	dipeptidyl peptidase III	1	DA
9493	DPP-III inhibitor	dipeptidyl peptidase III	1	HL
9504	DPP-III inhibitor	dipeptidyl peptidase III	1	PE
9505	DPP-III inhibitor	dipeptidyl peptidase III	1	PF
2842	Renin inhibitor	renin inhibitor	3	LR
9430	Renin inhibitor	renin inhibitor	1	NR
9432	Renin inhibitor	renin inhibitor	1	SF
9433	Renin inhibitor	renin inhibitor	2	YA
9470	Renin inhibitor	renin inhibitor	1	LY

Profiles of potential biological activity of Allphycocyanin gamma chain (A0A6F8SGE9)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3257	beta-lactokinin	ACE inhibitor	1	RL
3258	beta-lactokinin	ACE inhibitor	4	IR
3380	ACE inhibitor	ACE inhibitor	1	RY
3388	ACE inhibitor	ACE inhibitor	1	MY
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
3553	ACE inhibitor	ACE inhibitor	2	YG
3666	ACE inhibitor	ACE inhibitor	1	YP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	3	IA
7579	ACE inhibitor	ACE inhibitor	1	GW
7584	ACE inhibitor	ACE inhibitor	2	AP
7585	ACE inhibitor	ACE inhibitor	1	LA
7586	ACE inhibitor	ACE inhibitor	1	KR
7587	ACE inhibitor	ACE inhibitor	1	VP
7590	ACE inhibitor	ACE inhibitor	1	AA
7593	ACE inhibitor	ACE inhibitor	1	IF
7595	ACE inhibitor	ACE inhibitor	4	IG
7596	ACE inhibitor	ACE inhibitor	1	GI
7597	ACE inhibitor	ACE inhibitor	2	GM
7600	ACE inhibitor	ACE inhibitor	2	AG
7606	ACE inhibitor	ACE inhibitor	1	DA
7607	ACE inhibitor	ACE inhibitor	2	GS
7608	ACE inhibitor	ACE inhibitor	3	GV

7610	ACE inhibitor	ACE inhibitor	1	GQ
7615	ACE inhibitor	ACE inhibitor	1	GE
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	1	AI
7619	ACE inhibitor	ACE inhibitor	2	LG
7620	ACE inhibitor	ACE inhibitor	1	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	1	EA
7625	ACE inhibitor	ACE inhibitor	1	PG
7628	ACE inhibitor from kappa-CN (fr. 67-68)	ACE inhibitor	1	VR
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7680	ACE inhibitor from pea vicilin	ACE inhibitor	1	QK
7743	ACE inhibitor	ACE inhibitor	1	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7819	ACE inhibitor from wheat gliadin	ACE inhibitor	2	IAP
7822	ACE inhibitor from micro algae	ACE inhibitor	1	IAPG
7826	ACE inhibitor	ACE inhibitor	1	EI
7827	ACE inhibitor	ACE inhibitor	1	IE
7831	ACE inhibitor	ACE inhibitor	1	LQ
7833	ACE inhibitor	ACE inhibitor	1	PT
7840	ACE inhibitor	ACE inhibitor	1	EK
7841	ACE inhibitor	ACE inhibitor	3	KE
7842	ACE inhibitor	ACE inhibitor	1	HP
8968	ACE inhibitor	ACE inhibitor	1	ASL
9072	ACE inhibitor	ACE inhibitor	3	DY
9076	ACE inhibitor	ACE inhibitor	1	FQ
9173	ACE inhibitor	ACE inhibitor	1	RG
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9192	ACE inhibitor	ACE inhibitor	1	AGS
9213	ACE inhibitor	ACE inhibitor	3	LR
9326	ACE inhibitor	ACE inhibitor	1	LGV
9727	ACE inhibitor	ACE inhibitor	1	GVR
10044	ACE inhibitor	ACE inhibitor	1	YLR
3285	Antithrombotic peptide	antithrombotic	1	PG
2882	Immunostimulating peptide	immunomodulating	2	YG
8320	Glucose uptake stimulating peptide	stimulating	1	VL
8321	Glucose uptake stimulating peptide	stimulating	1	LV
8322	Glucose uptake stimulating peptide	stimulating	1	IV

8324	Glucose uptake stimulating peptide	stimulating	1	LI
8325	Glucose uptake stimulating peptide	stimulating	7	II
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2749	peptide regulating ion flow	regulating	3	DY
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	4	SL
3305		antioxidative	1	LH
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
8090	peptide derived from sardine muscle	antioxidative	1	MY
8134	peptide derived from dried bonito	antioxidative	1	KD
8215	Antioxidative peptide	antioxidative	4	IR
8217	Antioxidative peptide	antioxidative	1	LK
8219	antioxidative peptide	antioxidative	1	TY
9358	Antioxidative peptide	antioxidative	1	QCL
9880	Antioxidative peptide	antioxidative	1	RDY
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
9728	Hypotensive peptide	hypotensive	1	GVR
10141	Hypotensive peptide	hypotensive	1	AA
4006	Ubiquitin-mediated proteolysis activating peptide	activating ubiquitin-mediated proteolysis	1	LA
3174	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KA
3175	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LA
3177	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AP
3181	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VP
8500	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	APG
8520	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	HP
8521	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YP

8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IA
8558	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EK
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	SL
8594	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VR
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AA
8646	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IIAP
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	WY
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AT
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8774	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ET
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EY
8779	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FQ
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GG
8785	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GI
8786	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	GV
8787	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GW
8801	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	7	II
8805	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IQ
8806	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	IR
8808	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	KE
8814	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KR

8820	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LH
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LI
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LV
8832	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	ML
8838	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MY
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NA
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NR
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PI
8863	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PT
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PY
8868	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QD
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QI
8874	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QL
8877	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QS
8882	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RG
8884	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	RI
8885	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RK
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8893	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SI
8894	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SK
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TG
8903	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	TI
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TY
8922	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VL

8924	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VN
8926	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VS
8935	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YF
8936	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YG
8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YL
8942	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YN
9548	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	YP
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	EA
9694	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	PE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YF
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YL
9487	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	GE
9492	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	DA
9496	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	HP
9499	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	LA
9504	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	PE
9508	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YG
9510	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	KA
8247	CaMPDE inhibitor	CaMPDE inhibitor	4	IR
2842	Renin inhibitor	renin inhibitor	3	LR
8246	renin inhibitor	renin inhibitor	4	IR
9430	Renin inhibitor	renin inhibitor	1	NR

Profiles of Potential Biological Activity for C-phycoyanin beta chain (P00311)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	antiamnestic	2	PG
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3551	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	1	LF
3563	ACE inhibitor	ACE inhibitor	1	AY
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	3	IA
7583	ACE inhibitor	ACE inhibitor	1	AF
7586	ACE inhibitor	ACE inhibitor	1	KR
7587	ACE inhibitor	ACE inhibitor	1	VP
7588	ACE inhibitor	ACE inhibitor	2	RA
7589	ACE inhibitor	ACE inhibitor	1	YA
7590	ACE inhibitor	ACE inhibitor	3	AA
7594	ACE inhibitor	ACE inhibitor	2	VG
7596	ACE inhibitor	ACE inhibitor	2	GI
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	1	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7606	ACE inhibitor	ACE inhibitor	3	DA
7608	ACE inhibitor	ACE inhibitor	1	GV
7612	ACE inhibitor	ACE inhibitor	1	GT
7615	ACE inhibitor	ACE inhibitor	1	GE
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	4	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7619	ACE inhibitor	ACE inhibitor	1	LG
7620	ACE inhibitor	ACE inhibitor	2	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7622	ACE inhibitor	ACE inhibitor	1	EG
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	2	PG
7635	ACE inhibitor from k-CN (fr. 51-53)	ACE inhibitor	1	VAV
7644	ACE inhibitor from porcine myosin (306-308)	ACE inhibitor	1	ITT
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7684	ACE inhibitor from garlic	ACE inhibitor	1	SY
7698	ACE inhibitor from wakame	ACE inhibitor	1	NK
7741	ACE inhibitor	ACE inhibitor	1	RR
7742	ACE inhibitor	ACE inhibitor	2	AR
7826	ACE inhibitor	ACE inhibitor	1	EI
7827	ACE inhibitor	ACE inhibitor	1	IE

7828	ACE inhibitor	ACE inhibitor	1	EV
7832	ACE inhibitor	ACE inhibitor	1	LN
7834	ACE inhibitor	ACE inhibitor	1	TQ
7837	ACE inhibitor	ACE inhibitor	1	PQ
7839	ACE inhibitor	ACE inhibitor	1	ME
7840	ACE inhibitor	ACE inhibitor	1	EK
8184	ACE Inhibitor	ACE inhibitor	1	IQP
8951	ACE inhibitor	ACE inhibitor	2	AV
9075	ACE inhibitor	ACE inhibitor	1	DM
9077	ACE inhibitor	ACE inhibitor	1	YV
9079	ACE inhibitor	ACE inhibitor	2	IL
9173	ACE inhibitor	ACE inhibitor	1	RG
9213	ACE inhibitor	ACE inhibitor	3	LR
9326	ACE inhibitor	ACE inhibitor	1	LGV
9566	ACE inhibitor	ACE inhibitor	2	QP
9942	ACE inhibitor	ACE inhibitor	1	EF
10091	ACE inhibitor	ACE inhibitor	2	DR
3285	Antithrombotic peptide	antithrombotic	2	PG
8322	Glucose uptake stimulating peptide	stimulating	1	IV
8323	Glucose uptake stimulating peptide	stimulating	2	IL
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8325	Glucose uptake stimulating peptide	stimulating	2	II
8330	Stimulating vasoactive substance release	stimulating	2	SE
2754	peptide regulating the stomach mucosal membrane activity	regulating	2	PG
7866	peptide from Okara protein	antioxidative	1	AY
8134	peptide derived from dried bonito	antioxidative	1	KD
8219	antioxidative peptide	antioxidative	2	TY
10051	Antioxidative peptide	antioxidative	1	RY
10141	Hypotensive peptide	hypotensive	3	AA
4005		activating ubiquitin-mediated proteolysis	2	RA
3172	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VA
3173	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	MA
3176	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	FA
3181	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VP
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VV
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GA



8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	RA
8531	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TA
8532	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QP
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	FL
8558	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EK
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	4	AL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	AA
8693	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	IQP
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AD
8758	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AE
8759	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AF
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AT
8764	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	AV
8765	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	AY
8767	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	DP
8769	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	DR
8770	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EG
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EI
8774	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	ET
8775	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	EV
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GE
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV i	1	GG
8785	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	GI

8786	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	GV
8801	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	II
8802	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	IL
8805	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	IQ
8814	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KR
8817	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	KV
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LI
8822	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LM
8823	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	LN
8826	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	ME
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MK
8832	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	ML
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	3	NA
8840	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	ND
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NG
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	NT
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	PG
8861	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PQ
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	PS
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QA
8874	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	QL
8882	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RG
8884	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RI
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RM
8889	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	RR

8893	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SI
8894	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SK
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SV
8897	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	SY
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TG
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TQ
8910	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TS
8911	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	TT
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	TY
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VG
8924	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VN
8925	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VQ
8926	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	2	VS
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	VT
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YA
8935	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YF
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV	1	YV
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9478	DPP-III inhibitor	dipeptidyl peptidase III	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III	1	YF
9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9492	DPP-III inhibitor	dipeptidyl peptidase III	3	DA
9500	DPP-III inhibitor	dipeptidyl peptidase III	1	FA
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL

8250	CaMPDE inhibitor	CaMPDE inhibitor	1	EF
2842	Renin inhibitor	renin inhibitor	3	LR
8251	Renin inhibitor	renin inhibitor	1	EF
9430	Renin inhibitor	renin inhibitor	2	NR
9433	Renin inhibitor	renin inhibitor	1	YA
9580	Hypolipidemic peptide	hypolipidemic	1	EF

Profiles of Potential Biological Activity for R-phycoyanin beta chain (P59859)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3460	Prolyl endopeptidase inhibitor	antiamnestic	2	PG
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3551	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	1	LF
3563	ACE inhibitor	ACE inhibitor	1	AY
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	2	IA
7583	ACE inhibitor	ACE inhibitor	1	AF
7585	ACE inhibitor	ACE inhibitor	2	LA
7586	ACE inhibitor	ACE inhibitor	1	KR
7588	ACE inhibitor	ACE inhibitor	2	RA
7589	ACE inhibitor	ACE inhibitor	1	YA
7590	ACE inhibitor	ACE inhibitor	6	AA
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	1	GL
7600	ACE inhibitor	ACE inhibitor	2	AG
7606	ACE inhibitor	ACE inhibitor	5	DA
7612	ACE inhibitor	ACE inhibitor	2	GT
7615	ACE inhibitor	ACE inhibitor	1	GE
7616	ACE inhibitor	ACE inhibitor	1	GG
8193	ACE inhibitor	ACE inhibitor	3	AI
7619	ACE inhibitor	ACE inhibitor	1	LG
7620	ACE inhibitor	ACE inhibitor	2	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7622	ACE inhibitor	ACE inhibitor	1	EG
7624	ACE inhibitor	ACE inhibitor	1	NG
7625	ACE inhibitor	ACE inhibitor	2	PG
7635	ACE inhibitor from k-CN (fr. 51-53)	ACE inhibitor	1	VAV
7649	ACE inhibitor from red algae	ACE inhibitor	1	LRY
7680	ACE inhibitor from pea vicilin	ACE inhibitor	1	QK
7684	ACE inhibitor from garlic	ACE inhibitor	1	SY
7698	ACE inhibitor from wakame	ACE inhibitor	2	NK

7741	ACE inhibitor	ACE inhibitor	1	RR
7742	ACE inhibitor	ACE inhibitor	2	AR
7826	ACE inhibitor	ACE inhibitor	2	EI
7832	ACE inhibitor	ACE inhibitor	1	LN
7834	ACE inhibitor	ACE inhibitor	1	TQ
7837	ACE inhibitor	ACE inhibitor	1	PQ
7839	ACE inhibitor	ACE inhibitor	1	ME
8951	ACE inhibitor	ACE inhibitor	2	AV
8968	ACE inhibitor	ACE inhibitor	1	ASL
9073	ACE inhibitor	ACE inhibitor	2	TP
9075	ACE inhibitor	ACE inhibitor	1	DM
9077	ACE inhibitor	ACE inhibitor	1	YV
9173	ACE inhibitor	ACE inhibitor	1	RG
9213	ACE inhibitor	ACE inhibitor	3	LR
9566	ACE inhibitor	ACE inhibitor	1	QP
9942	ACE inhibitor	ACE inhibitor	1	EF
10091	ACE inhibitor	ACE inhibitor	2	DR
3285	Antithrombotic peptide	antithrombotic	2	PG
8320	Glucose uptake stimulating peptide	stimulating	2	VL
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8322	Glucose uptake stimulating peptide	stimulating	3	IV
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8326	Glucose uptake stimulating peptide	stimulating	1	LL
8330	Stimulating vasoactive substance release	stimulating	1	SE
2754	peptide regulating the stomach mucosal membrane activity	regulating	2	PG
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
7866	peptide from Okara protein	antioxidative	1	AY
8134	peptide derived from dried bonito	antioxidative	1	KD
8219	antioxidative peptide	antioxidative	2	TY
9879	Antioxidative peptide	antioxidative	1	SVL
10051	Antioxidative peptide	antioxidative	1	RY
10141	Hypotensive peptide	hypotensive	6	AA
4005		activating ubiquitin-mediated proteolysis	2	RA
4006	Ubiquitin-mediated proteolysis activating peptide	activating ubiquitin-mediated proteolysis	2	LA

3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	5	VA
3173	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MA
3175	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LA
3176	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	FA
3179	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PA
3182	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LL
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TP
8505	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	RA
8532	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QP
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	5	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	6	AA
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8758	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AE
8759	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AF
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	4	AS
8763	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AT

8764	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AV
8765	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AY
8769	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	DR
8770	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EG
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	EI
8774	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ET
8781	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GE
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GG
8805	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	IQ
8812	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KI
8814	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KR
8817	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KV
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LI
8823	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LN
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LV
8826	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ME
8830	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MI
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8832	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ML
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	NA
8840	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	ND
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NG
8847	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NN
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NT
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	PG

8861	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PQ
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	QA
8873	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QI
8874	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QL
8882	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RG
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8889	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RR
8895	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SV
8897	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SY
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TG
8907	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TN
8908	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TQ
8910	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TS
8911	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TT
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TY
8922	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VL
8924	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VN
8926	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VS
8927	dipeptidyl peptidase IV inhibitor (	dipeptidyl peptidase IV inhibitor	1	VT
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YA
8935	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YF
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YV
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD



9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	3	LR
9480	DPP-III inhibitor	dipeptidyl peptidase III	1	YF
9485	DPP-III inhibitor	dipeptidyl peptidase III	1	RR
9487	DPP-III inhibitor	dipeptidyl peptidase III	1	GE
9492	DPP-III inhibitor	dipeptidyl peptidase III	5	DA
9499	DPP-III inhibitor	dipeptidyl peptidase III	2	LA
9500	DPP-III inhibitor	dipeptidyl peptidase III	2	FA
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9516	DPP-III inhibitor	dipeptidyl peptidase III	1	AAAA
8250	CaMPDE inhibitor	CaMPDE inhibitor	1	EF
2842	Renin inhibitor	renin inhibitor	3	LR
8251	Renin inhibitor	renin inhibitor	1	EF
9433	Renin inhibitor	renin inhibitor	1	YA
9580	Hypolipidemic peptide	hypolipidemic	1	EF

Profiles of Potential Biological Activity for C-phycoyanin alpha chain (P00306)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3461	Prolyl endopeptidase inhibitor	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	1	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	2	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	2	YA
7590	ACE inhibitor	ACE inhibitor	7	AA
7594	ACE inhibitor	ACE inhibitor	2	VG
7595	ACE inhibitor	ACE inhibitor	1	IG
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR

7610	ACE inhibitor	ACE inhibitor	1	GQ
7611	ACE inhibitor	ACE inhibitor	1	GK
7612	ACE inhibitor	ACE inhibitor	1	GT
7614	ACE inhibitor	ACE inhibitor	1	HG
7616	ACE inhibitor	ACE inhibitor	1	GG
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	2	AI
7618	ACE inhibitor	ACE inhibitor	1	SG
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	4	EA
7624	ACE inhibitor	ACE inhibitor	2	NG
7625	ACE inhibitor	ACE inhibitor	1	PG
7682	ACE inhibitor from garlic	ACE inhibitor	1	NY
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	2	AR
7743	ACE inhibitor	ACE inhibitor	2	KA
7752	ACE inhibitor from shark meat hydrolysate	ACE inhibitor	1	EY
7826	ACE inhibitor	ACE inhibitor	1	EI
7829	ACE inhibitor	ACE inhibitor	1	VE
7830	ACE inhibitor	ACE inhibitor	2	TE
7831	ACE inhibitor	ACE inhibitor	1	LQ
7832	ACE inhibitor	ACE inhibitor	1	LN
7837	ACE inhibitor	ACE inhibitor	1	PQ
8185	ACE inhibitor	ACE inhibitor	1	TF
8382	ACE inhibitor from as2-CN (170-172)	ACE inhibitor	1	RYQ
8951	ACE inhibitor	ACE inhibitor	3	AV
8968	ACE inhibitor	ACE inhibitor	1	ASL
9026	ACE inhibitor	ACE inhibitor	1	LNy
9031	ACE inhibitor	ACE inhibitor	1	LEE
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	1	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9077	ACE inhibitor	ACE inhibitor	1	YV
9151	ACE inhibitor	ACE inhibitor	1	TGP
9183	ACE inhibitor	ACE inhibitor	1	GTG
9213	ACE inhibitor	ACE inhibitor	1	LR
9944	ACE inhibitor	ACE inhibitor	1	ER
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GYy

8321	Glucose uptake stimulating peptide	stimulating	1	LV
8324	Glucose uptake stimulating peptide	stimulating	2	LI
8329	Stimulating vasoactive substance release	stimulating	1	EE
2890	neuropeptide	neuropeptide	1	GQ
8310	Anxiolytic peptide	neuropeptide	2	YL
2749	peptide regulating ion flow	regulating	1	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG
2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	2	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GYY
7888	antioxidative peptide	antioxidative	1	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8219	antioxidative peptide	antioxidative	2	TY
8224	antioxidative peptide	antioxidative	1	VY
8474	Antioxidant peptide from as2-CN (170-172)	antioxidative	1	RYQ
8983	Antioxidative peptide	antioxidative	1	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
9362	Antioxidative peptide	antioxidative	1	YVE
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	7	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP
3171	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MP

3174	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	KA
3183	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VV
8503	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GA
8525	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	IA
8526	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RA
8555	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AL
8560	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	SL
8561	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	7	AA
8683	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AD
8758	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AE
8760	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	AG
8762	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	AS
8764	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	AV
8766	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	DN
8772	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EI
8777	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	EY
8783	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GG

8788	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GY
8804	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	IN
8809	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KF
8816	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	KT
8821	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	LI
8823	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LN
8824	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LT
8825	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	LV
8831	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NA
8841	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NE
8843	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NG
8844	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NH
8848	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NQ
8849	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NR
8850	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	NT
8853	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	NY
8855	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PG
8857	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PI
8859	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PM

8861	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PQ
8862	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PS
8866	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	PY
8867	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	3	QA
8871	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QG
8881	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	QY
8886	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	RM
8894	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SK
8896	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TE
8900	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TF
8901	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	TG
8910	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TS
8914	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	TY
8916	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VE
8918	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	VG
8924	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VN
8927	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VT
8929	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	VY
8932	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YA

8938	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YI
8940	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	2	YL
8943	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YQ
8945	dipeptidyl peptidase IV	dipeptidyl peptidase IV inhibitor	1	YS
8946	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YV
8948	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	YY
9117	dipeptidyl peptidase IV inhibitor	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	4	EA
9693	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	VE
9695	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	1	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YL
9486	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	TF
9490	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	1	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III inhibitor	2	KA
8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	1	NR
9433	Renin inhibitor	renin inhibitor	2	YA
9471	Renin inhibitor	renin inhibitor	1	TF
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

Profiles of Potential Biological activity for R-phycoyanin alpha chain (P59858)

<b>ID</b>	<b>Name of peptide</b>	<b>Activity</b>	<b>Number</b>	<b>Sequence</b>
3459	Prolyl endopeptidase (PEP) inhibitor	antiamnestic	1	PGP
3460	Prolyl endopeptidase inhibitor	antiamnestic	1	PG
3461	Prolyl endopeptidase inhibitor	antiamnestic	2	GP
3257	beta-lactokinin	ACE inhibitor	1	RL
3380	ACE inhibitor	ACE inhibitor	1	RY
3489	ACE inhibitor from sake lees	ACE inhibitor	1	RF
3492	ACE inhibitor from sake	ACE inhibitor	1	VY
3502	ACE inhibitor (BSA fr. 221-222)	ACE inhibitor	1	FP
3532	ACE inhibitor	ACE inhibitor	1	GY
3541	ACE inhibitor	ACE inhibitor	1	LSP
3550	ACE inhibitor (from bovine beta-Lg)	ACE inhibitor	2	YL
3580	ACE Inhibitor	ACE inhibitor	1	DIGYY
7512	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	2	GP
7513	ACE inhibitor from Alaskan pollack skin	ACE inhibitor	1	PL
7562	ACE inhibitor from soy hydrolysate	ACE inhibitor	1	IA
7588	ACE inhibitor	ACE inhibitor	1	RA
7589	ACE inhibitor	ACE inhibitor	1	YA
7590	ACE inhibitor	ACE inhibitor	4	AA
7594	ACE inhibitor	ACE inhibitor	1	VG
7595	ACE inhibitor	ACE inhibitor	2	IG
7598	ACE inhibitor	ACE inhibitor	1	GA
7599	ACE inhibitor	ACE inhibitor	2	GL
7600	ACE inhibitor	ACE inhibitor	1	AG
7603	ACE inhibitor	ACE inhibitor	2	GR
7611	ACE inhibitor	ACE inhibitor	1	GK
7612	ACE inhibitor	ACE inhibitor	1	GT
7614	ACE inhibitor	ACE inhibitor	1	HG
7616	ACE inhibitor	ACE inhibitor	1	GG
7617	ACE inhibitor	ACE inhibitor	1	QG
8193	ACE inhibitor	ACE inhibitor	3	AI
7618	ACE inhibitor	ACE inhibitor	2	SG
7620	ACE inhibitor	ACE inhibitor	1	GD
7621	ACE inhibitor	ACE inhibitor	1	TG
7623	ACE inhibitor	ACE inhibitor	4	EA
7624	ACE inhibitor	ACE inhibitor	1	NG



7625	ACE inhibitor	ACE inhibitor	1	PG
7682	ACE inhibitor from garlic	ACE inhibitor	1	NY
7691	ACE inhibitor from wakame	ACE inhibitor	1	KY
7692	ACE inhibitor	ACE inhibitor	1	KF
7742	ACE inhibitor	ACE inhibitor	1	AR
7743	ACE inhibitor	ACE inhibitor	2	KA
7826	ACE inhibitor	ACE inhibitor	1	EI
7827	ACE inhibitor	ACE inhibitor	1	IE
7830	ACE inhibitor	ACE inhibitor	2	TE
7831	ACE inhibitor	ACE inhibitor	1	LQ
7834	ACE inhibitor	ACE inhibitor	1	TQ
8185	ACE inhibitor	ACE inhibitor	1	TF
8951	ACE inhibitor	ACE inhibitor	1	AV
9031	ACE inhibitor	ACE inhibitor	1	LEE
9052	ACE inhibitor	ACE inhibitor	1	GPM
9072	ACE inhibitor	ACE inhibitor	2	DY
9073	ACE inhibitor	ACE inhibitor	1	TP
9151	ACE inhibitor	ACE inhibitor	1	TGP
9160	ACE inhibitor	ACE inhibitor	1	TLS
9183	ACE inhibitor	ACE inhibitor	1	GTG
9184	ACE inhibitor	ACE inhibitor	1	ST
9185	ACE inhibitor	ACE inhibitor	1	YN
9213	ACE inhibitor	ACE inhibitor	1	LR
9946	ACE inhibitor	ACE inhibitor	1	YY
10044	ACE inhibitor	ACE inhibitor	1	YLR
10045	ACE inhibitor	ACE inhibitor	1	LRM
10091	ACE inhibitor	ACE inhibitor	1	DR
3283	Antithrombotic peptide	antithrombotic	2	GP
3284	antithrombotic peptide	antithrombotic	1	PGP
3285	Antithrombotic peptide	antithrombotic	1	PG
3786		opioid	1	GYG
8321	Glucose uptake stimulating peptide	stimulating	2	LV
8324	Glucose uptake stimulating peptide	stimulating	1	LI
8329	Stimulating vasoactive substance release	stimulating	1	EE
8310	Anxiolytic peptide	neuropeptide	2	YL
2749	peptide regulating ion flow	regulating	2	DY
2753	peptide regulating the stomach mucosal membrane activity	regulating	2	GP
2754	peptide regulating the stomach mucosal membrane activity	regulating	1	PG

2756	peptide regulating the stomach mucosal membrane activity	regulating	1	PGP
9955	Regulator of phosphoglycerate kinase activity	regulating	1	SL
7867	antioxidative peptide from Okara protein	antioxidative	1	GYG
7888	antioxidative peptide	antioxidative	2	EL
7898	peptide from bovine b-lactoglobulin	antioxidative	1	WY
7941	synthetic peptide	antioxidative	1	YYL
8217	Antioxidative peptide	antioxidative	1	LK
8219	antioxidative peptide	antioxidative	2	TY
8220	antioxidative peptide	antioxidative	1	TFE
8224	antioxidative peptide	antioxidative	1	VY
8983	Antioxidative peptide	antioxidative	1	GAA
9359	Antioxidative peptide	antioxidative	1	CLV
10051	Antioxidative peptide	antioxidative	1	RY
9856	Anti-inflammatory peptide	anti inflammatory	1	PY
3046	inhibitor of insulin secretion	inhibitor	1	PGP
3464	Chemotactic peptide	chemotactic	1	PGP
10141	Hypotensive peptide	hypotensive	4	AA
4005		activating ubiquitin-mediated proteolysis	1	RA
3169	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GP
3171	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MP
3172	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	VA
3174	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	KA
3183	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	VV
8503	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TP
8505	Dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SP
8506	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FP
8524	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GA
8525	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	IA
8526	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RA

8531	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TA
8555	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	FL
8559	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	AL
8560	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SL
8561	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	GL
8637	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	4	AA
8638	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PL
8683	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	WY
8696	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YT
8757	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	AD
8760	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AG
8763	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AT
8764	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	AV
8769	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	DR
8772	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	EI
8783	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GG
8788	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GY
8804	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	IN
8809	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KF
8816	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KT
8819	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	KY
8821	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	LI
8824	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LT
8825	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	LV

8831	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MK
8837	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	MV
8839	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	NA
8841	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NE
8843	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NG
8844	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NH
8847	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NN
8849	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	NR
8850	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	NT
8853	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	NY
8855	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PG
8859	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PM
8860	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PN
8862	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PS
8866	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	PY
8871	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QG
8879	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	QV
8886	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RL
8887	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	RM
8894	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SK
8896	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	SW
8899	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TE
8900	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TF

8901	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TG
8905	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TL
8908	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TQ
8910	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TS
8911	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	TT
8914	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	TY
8918	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VG
8924	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VN
8927	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VT
8929	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	VY
8932	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YA
8938	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	3	YI
8940	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YL
8942	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YN
8945	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	2	YS
8948	dipeptidyl peptidase IV inhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	YY
9117	dipeptidyl peptidase IV Cinhibitor (DPP IV inhibitor)	dipeptidyl peptidase IV inhibitor	1	GPM
9650	Alpha-glucosidase inhibitor	alpha-glucosidase inhibitor	4	EA
9695	Alpha-glucosidase inhibitor	alpha-glucosidase	2	AD
9476	DPP-III inhibitor	dipeptidyl peptidase III	1	YY
9478	DPP-III inhibitor	dipeptidyl peptidase III	1	LR
9482	DPP-III inhibitor	dipeptidyl peptidase III	2	YL
9486	DPP-III inhibitor	dipeptidyl peptidase III	1	TF
9490	DPP-III inhibitor	dipeptidyl peptidase III	1	RF
9502	DPP-III inhibitor	dipeptidyl peptidase III	1	FL
9509	DPP-III inhibitor	dipeptidyl peptidase III	1	VY
9510	DPP-III inhibitor	dipeptidyl peptidase III	3	YI
9511	DPP-III inhibitor	dipeptidyl peptidase III	2	KA

8249	CaMPDE inhibitor	CaMPDE inhibitor	1	KF
2842	Renin inhibitor	renin inhibitor	1	LR
8248	Renin inhibitor	renin inhibitor	1	KF
9430	Renin inhibitor	renin inhibitor	2	NR
9433	Renin inhibitor	renin inhibitor	1	YA
9471	Renin inhibitor	renin inhibitor	1	TF
10220	Tyrosinase inhibitor	tyrosinase inhibitor	1	FPY

## **Brief Biography**

Razia Sultana is the daughter of Jakir Hossain and Salma Begum who was born in Chattogram. She received GPA of 5 on the Secondary School Certificate Exam in 2011 and a GPA of 4.9 on the Higher Secondary Certificate Exam in 2013. She earned a B.Sc. (Hons.) in Food Science and Technology (BFST) with a CGPA of 3.58 from the Faculty of Food Science and Technology, Chattogram Veterinary and Animal Sciences University (CVASU) in Bangladesh. She is now an MS candidate in Applied Food Science and Nutrition department at CVASU's Faculty of Food Science and Technology. She is very interested to do research work. Currently, she is doing job at Rohingya Camp, Cox's Bazar.