

## Um mig (2019)

### Curriculum Vitae (CV) 2019

Ágústa Guðmundsdóttir, Ph.D, professor emeritus, University of Iceland

#### Nafn og starf - name and position

Ágústa Guðmundsdóttir, Ph.D

1989-2015, Prófessor í matvælaefnafræði

Professor of Food Chemistry

Matvæla-og næringarfræðideild, Heilbrigðisvísindasviði Háskóla Íslands

Faculty of Food Science and Nutrition, School of Health Sciences and Science Institute, University of Iceland.

2015-present, research director, Biotechnology Company Zymetech

2015 til dagsins í dag: Rannsóknastjóri líftæknifyrirtækisins Zymetech

2016 til dagsins í dag: Vísindaráðgjafi sænka líftæknifyrirtækisins Enzymatica AB  
Scientific advisor to Enzymatica AB

#### Fjölskylduhagir (Family)

Fædd í Reykjavík 2. Júlí árið 1945 (Reykjavík, July 2. 1945)

Maki 1. (husband 1): Pálmi Ragnar Pálmason, verkfræðingur (f. 1940)

Maki 2. (husband 2): Jón Bragi Bjarnason, prófessor (f. 1948 - d. 2011)

Þrjú börn – (Three children): Ingibjörg Ýr Pálmadóttir (f. 1963), Anna Theodóra Pálmadóttir (f. 1966) and Guðmundur Pálmason (f. 1968).

#### Positions held

1989-2015 Prófessor í matvælaefnafræði við matvæla-og næringarfræðideild Heilbrigðisvísindasviðs Háskóla Íslands (Professor of Food Chemistry, Faculty of Food Science and Nutrition, School of Health Sciences, University of Iceland)

1989-present Gistiprófessor við örverufræði- ónæmisfræði- og krabbameinsfræðideild Læknadeildar Virginíuháskólans í Bandaríkjunum (Visiting professor, Department of Microbiology, Immunology and Cancer, University of Virginia, School of Medicine, Charlottesville, Virginia)

1999 Einn stofnenda líftæknifyrirtækisins Zymetech/Ensímtækni (Cofounder of the Biotechnology Company Zymetech)

Rannsóknastjóri Zymetech (1999-present, Research Director Zymetech)

2016-present Scientific Advisor (vísindaráðgjafi) of the Biotechnology Company Enzymatica AB  
and Chairman (stjórnarformaður) of Enzymatica's Scientific and Medical Advisory Board

## **Nám og námsgráður - Studies and degrees**

1984 – 1988 Ph.D in microbiology and molecular biology from the Department of Microbiology, Immunology and Cancer (MIC), University of Virginia School of Medicine

BS hon í lífefnafræði 1984 (BS hon. In biochemistry at the University of Iceland.

BS í matvælafræði 1980 frá Háskóla Íslands (1976 – 1980 University of Iceland, B.S. in food science )

Doktor (Ph.D) 1988 frá örverufræði-, ónæmisfræði- og krabbameinsfræðideild Læknadeild Virginíuháskólans í Bandaríkjunum.

Ágústa Guðmundsdóttir (1988)

Doktorsritgerð (Thesis): "Genetic Analysis of BtuB: A Vitamin B12 Binding and Transport Protein in the *Escherichia coli* Outer Membrane", A Dissertation Presented to the Graduate Faculty of the University of Virginia in Candidacy for the Degree of Doctor of Philosophy, Department of Microbiology, University of Virginia (1-190)

Ágústa Guðmundsdóttir (1983). Efnafræðiskor raunvísindadeildar Háskóla Íslands

BS hon. verkefni við Háskóla Íslands - Graduate thesis (BS honours)

Verkefni: Changes in the fatty acid composition of rat heart phospholipids during the neonatal period. Dissertation presented to the Faculty of Chemistry in Candidacy for a Graduate degree in biochemistry. Faculty of engineering and science, University of Iceland (1-45)

## **Rannsóknáherslur (1989-2019)**

Notkun þorskatrypsíns í lækningavörur (PreCold/ColdZyme), sem ætlaðar eru til meðhöndlunar á öndunarferasýkingum af völdum veira eins og t.d. kvefi (common cold). Grunnrannsóknir á mismunandi trypsin afbrigðum úr þorski (*Gadus morhua*) og notkun þeirra í lækningavörur (Sandholt, GB, Stefánsson, B. and Gudmundsdóttir, Á. (2019). Biochemical characterization of a native group III trypsin ZT from Atlantic cod (*Gadus morhua*). International Journal of Biological Macromolecules 125 (2019) 847–855; Stefansson B, Sandholt GB, Gudmundsdottir Á (2017) Elucidation of different cold-adapted Atlantic cod (*Gadus morhua*) trypsin X isoenzymes. Biochim Biophys Acta Proteins Proteomics 1865:11–19.

## **Research interests**

Ongoing research activities (1989-2019). Use of cod trypsin in biomedicine. Development of medical devices (PreCold/ColdZyme) to treat upper respiratory tract virus infections such as the common cold (Gudmundsdóttir et al., 2013).

Basic research regarding isolation and characterization of different trypsin isoenzymes for use in future medical devices

## **Previous research interests**

Genetic engineering and large-scale production of serine proteases from the Atlantic cod (*Gadus morhua*). Large-scale production of Atlantic cod trypsin for biomedical use (medical devices, pharmaceuticals, cosmetics, natural products). Research and development performed for the biotechnology conglomerate Enzymatica-Zymetech.

Previous research (1989-2006): Expression and mutagenesis of the cDNA encoding Euphauserase (Euphalyisin), a brachyurin type Antarctic krill (*Euphausea superba*) serine protease. Research performed in collaboration with Phairson Medical Ltd. In London. The main purpose of the project is to produce recombinant Euphauserase in *Pichia pastoris* for medical purposes. Also, to make derivatives of the enzyme with increased stability to autolysis in order to increase its shelf-life. Furthermore, characterization of the gene encoding the novel trypsin Y involving expression of the recombinant trypsin Y in the yeast *Pichia pastoris* and isolation of the enzyme from its natural source. The specific role of trypsin Y in the cold-adaptation and development of early Atlantic cod larvae is also being analyzed. The study also includes the development of a real-time quantitative RT-PCR method to measure alpha-actin- and trypsin gene expression in the Atlantic cod. Analysis of the importance of serine proteases, in particular Trypsins and other proteins in the development and survival of early stage Atlantic cod (*Gadus morhua*) larvae.

The use of trypsin and other important proteins as biomarkers for estimating the nutritional status of early cod Larvae is also of interest to our research group. Expression of cod trypsin in cold-adapted bacterial expression systems. Antipathogenic efficacy of cod trypsin. 1989-1993 Isolation of biopreservatives from lactic acid bacteria. Involving isolation, characterization and large-scale production of a bacteriocin, termed carnocin UI49, from *Carnobacterium piscicola* with the purpose of using it as a food preservative.

### **Samstarfsaðilar (collaborators)**

Professor Charles S. Craik, University of California, San Francisco  
Professor Robert Kadner, University of Virginia, Charlottesville, Virginia  
Professor Jan Clebowski, Virginia Commonwealth University  
Enzymatica AB, Sweden

### **Research funding**

AVS Research Fund, Tækniþróunarsjóður Rannís, Icelandic Council of Science, National Research Council, University of Iceland Research Foundation, Nordic Industrial Foundation, National Research Council, Phairson Medical Ltd., EU COST program.

### **Awards/Stipends**

1986 NATO Research Fellowship  
1990 Fulbright Research Award  
1993 Fulbright Research Award  
2016 Food Scientists and Nutritionists Association of Iceland.  
Award for outstanding career at the University of Iceland and as an Entrepreneur

### **Teaching activities**

1979-1980 Icelandic Nursing School, lectures in biochemistry, organic chemistry and nutrition.  
1980-1983 University of Iceland: Biochemistry and organic chemistry  
1984-1988 University of Virginia: Medical microbiology  
1988-2015 Undergraduate courses in food chemistry, biochemistry, nutrition and microbiology. Graduate courses in molecular biology (Applied genetic engineering) with emphasis on genetically modified foods and drugs

## **Societies**

University of Virginia Alumni Association

Yale Club of New York City

European Society of Biochemistry

Biochemistry Association of Iceland

Icelandic Academy of Sciences

The Icelandic Association of Food Scientists and Nutritionists

Biology Association of Iceland

Gæðastjórnunarfélag Íslands (The Icelandic Association for Quality Control)

Forseti Rótarýklúbbs Reykjavíkur 2015-2016. The Rotary Club of Reykjavík 1997-present.

Rotary International

## **Administrative activities**

1989-1993 Norræni Iðnþróunarsjóðurinn, stýrihópur um prótein verkfræði (Nordic Industrial Foundation: Steering committee member of the NI Umbrella Program on Protein Engineering)

1989 Norræna ráðherranefndin, meðlimur stjórnunarnefndar „Nýja lífefnafræðin“ Nordic Council of Ministers: Steering committee member on the use of "New Biotechnology" in the food industry

1989 Stjórnarnefnd um notkun ensíma úr bakteríum í iðnaði á Íslandi (Steering committee: "Bacterial enzymes for industrial use" in Iceland)

1989 Stjórn matvæla-og næringarfræðifélags Íslands (MNÍ). Steering committee: Association of Food Scientists and Nutritionists in Iceland

1989 Stjórn gæðastjórnunarfélags Íslands (Steering committee: The Icelandic association for Quality Control).

1990-2004 Steering committee: The Icelandic Council for Nutrition  
Stjórn efnafræðiskorar: Steering committee: Department of Chemistry

1991-2005 Formaður ýmissa valnefnda raunvísindadeildar Háskóla Íslands (Committee chairman for the evaluation of several candidates for tenor promotions, Faculty of Sciences, University of Iceland.

1995-1997 og 1999-2002 Formaður matvæla-og næringarfræðiskorar  
Chairman of the Food Science Department, University of Iceland

1995-1999 Stjórn Food Fair ráðs Evrópusambandsins  
Member of the sub-group of the European Union program on Structural Biology. Member of the European Union Food-FAIR Programme Committee

1994-2002 Stjórn nefndar Háskóla Íslands til að efla tengsl skólans við íslenskan iðnað.  
Member of the University of Iceland's committee with a role in increasing the interaction between the University and the industry in Iceland

1996-1999 Í forsvari fyrir Háskóla Íslands vegna fjáröflunar vegna uppbyggingar aðstöðu fyrir kennslu í matvæla-og næringarfræði (In charge of a project on behalf of the University of Iceland on fundraising for a Food Science Institute building in Reykjavík)

1990-1993 Formaður kynningarnefndar háskólaráðs Háskóla Íslands (Chairman of the Public Relations Committee at the University of Iceland and earlier a board member.

1989-2015 Framkvæmdastjóri rannsóknastofu í matvælaefnafræði í Læknagarði og á Raunvísindastofnun Háskólans (Chairman og the Unit of Food Chemistry Research, Science Institute, Laeknagarði and The Science Institute, University of Iceland)

2002-2004 Representative for the Faculty of Science at the biannual University Meeting (Háskólafundi).

2002-present Member of the board of the Continued Education Institute, University of Iceland

2006-present Chairman for the Graduate Program Committee, Faculty of Science University of Iceland.

2003-2005 Appointed by the president of the University of Iceland to serve as the chairman for a committee on science- and research policy making at the University of Iceland.

1995-2001 Í stjórn Rannsóknþjónustu Háskólans  
Board member of the University of Iceland Research Service Center.

2005-2015 Formaður stjórnar næringarstofu Háskólans-LSH  
Chairman of the board of the Unit for Nutrition, University of Iceland

2002-2012 Í stjórn AVS rannsóknasjóðs Sjávarútvegsins, tilnefnd af sjávarútvegsráðherra  
Member of the board of the Research Fund on Increasing the Value of Seafood Products (AVS), appointed by the Icelandic minister of fisheries in 2002.

1990-1993 Member of the evaluation committee for the Research Council of Iceland (Tæknisjóður Rannís)

2002-2005 Í stjórn rannsóknamatsefndar Krabbameinsfélagsins  
Member of a research evaluation committee for the Icelandic Cancer Research Institute.

2003-2009 Í stjórn Nýsköpunarsjóðs Atvinnulífsins (NSA), skipuð af Sjávarútvegsráðherra  
Member of the board of the New Venture Capital Fund of Iceland (NSA). Appointed by the Icelandic Minister of Fisheries

2003 Í ráðgjafarnefnd um erfðabreytt matvæli á vegum Umhverfissráðuneytisins.  
Member of an advisory group on genetically modified foods formed by the Icelandic Minister of Environmental Protection.

2006-2016 Í stjórn Matís ohf í 10 ár.  
Member of the board of Matís ohf (The Food Research Institute)

2012 Formaður stjórnar Sambands Íslenskra Líftæknifyrirtækja (SÍL).  
Society for Industry (biotechnology sector)

2014-2018 Formaður stjórnar Landsbókasafns-Háskólabókasafn  
Chairman of the Board of the National and University Library of Iceland

## Útskrifaðir doktorar (Ph.D) og meistarar (MS) - Graduated Ph.D and MS students

### Ph.D students

Geesje Stoffels 1993. Ph.D degree in Food Science in collaboration with the Agricultural University, Ås Norway. Thesis: “Carnocin UI49, a lantibiotic from *Carnobacterium piscicola*“ Agricultural University Norway, Doctor Scientiarum Thesis, Department of Biotechnology, Agricultural University of Norway, Ås.

Helga Margrét Pálsdóttir, Ph.D. degree in Food Science from the University of Iceland in 2006. Presented to the Faculty of Food Science and Nutrition, School of Health Sciences. Thesis work: The novel group III trypsin Y and its expression in the Atlantic cod (*Gadus morhua*) Analysis of the novel Atlantic cod trypsin Y.

Hólmfríður Sveinsdóttir, Ph.D degree in Food Science from the University of Iceland in 2009. Presented to the Faculty of Food Science and Nutrition, School of Health Sciences. Thesis work: Exploring changes in the proteome of early Atlantic cod (*Gadus morhua*) larvae with age and in responset o environmental factors.

Gunnar Sandholt, Ph.D degree in Food Science from the University of Iceland (February 15. 2019). Thesis work: Atlantic cod (*Gadus morhua*) trypsin – isoenzyme diversity and antiviral activity

### MS students

Skarphéðinn P. Óskarsson, (1994). Thesis work: Cloning, sequencing and structural characterization of the gene encoding Atlantic cod chymotrypsinogen B. Masters thesis presented to the Department of Chemistry, Faculty of Science, University of Iceland

Sigríður Kristjánsdóttir, (1999). Thesis work: Expression and Modification of euphauserase a broad specific serine protease from Arntarctic krill. M.S. Thesis, University of Iceland , Faculty of Science, Department of Food Science.

Guðrún Jónsdóttir (2003). Thesis work: Recombinant trypsin I from Atlantic cod (*Gadus morhua*). Expression, purification, activation and modification. M.S. Thesis, University of Iceland , Faculty of Science, Department of Food Science.

Maria Luiz Fernandes (2006). Thesis work: Handbook for Establishing Quality Assurance Systems om Fish Inspection Laboratories in Mosambique. M.S. Thesis, University of Iceland , Faculty of Science, Department of Food Science.

Una Björk Jóhannsdóttir (2009). Thesis work: Activity of Atlandic cod trypsin towards cytokines and other proteins“. MS thesis presented to the Faculty of Food Science and

Nutrition, School of Health Sciences, University of Iceland. M.S. Thesis, University of Iceland , Faculty of Science, Department of Food Science.

Guðrún Birna Jakobsdóttir (040987-2669) – Thesis work: Characterization of trypsin forms from Atlantic cod (*Gadus morhua*). October 27, 2012. M.S. Thesis, University of Iceland , Faculty of Science, Department of Food Science.

Karen Ósk Pétursdóttir (280287-2299) – Thesis work: Production of cod trypsin I in cold-adapted expression systems. October 27, 2012

### **Other**

#### **Various MS and Ph.D committees.**

Bryndís Eva Birgisdóttir, Ph.D in nutrition 2002

Sigrún Guðmundsdóttir, Ph.D in microbiology 2006

Ína B. Össurardóttir, MS 2005

Guðrún Ólafsdóttir, Ph.D in Food Science, August 2005

Bryndís Björnsdóttir, MS in fish biology, 2004

Minh Van Nguyen (Ph.D) – Graduated 2012

Sigrún Mjöll Halldórsdóttir (Ph.D) – Graduated 2012