Grant Kemp

Curriculum vitae



University of Alberta
Faculty of Science
CCIS 6-193
Edmonton, Canada
T6G 2E9
T +1 780 492 3397
+1 825 993 7553
grant.kemp@ualberta.ca
in grant-kemp-biochemist

Faculty of Science Strategic Lead, Research Infrastructure and Development, *University of Alberta, Canada*. **2026–present**
Supporting large scale research projects and collaborations

Research Partner, *University of Alberta, Canada*, Office of the Vice-President Research. **2023–2026**
Supporting international grant development including Horizon Europe

Staff Scientist and Lab Manager, *Stockholm University*, Stockholm, Sweden. **2020–2023**
with Ville Kaila, Department of Biochemistry and Biophysics

Researcher, *Stockholm University*, Stockholm, Sweden. **2018–2020**
with Gunnar von Heijne, Department of Biochemistry and Biophysics

Postdoctoral Fellow, *Stockholm University*, Stockholm, Sweden. **2014–2017**
with Gunnar von Heijne, Department of Biochemistry and Biophysics

PhD, *University of Alberta*, Edmonton, Canada, Biochemistry. **2007–2013**
PhD Thesis *Towards a structural understanding of eukaryotic Na^+/H^+ exchangers*,
Supervisors: Dr. Howard Young and Dr. Larry Fliegel

BSc, *University of Alberta*, Edmonton, Canada. **2003–2007**
Specialization in Biochemistry

Publications

Beghiah, A. *et al.* (2024). Dissected antiporter modules establish minimal proton-conduction elements of the respiratory complex i. *NATURE COMMUNICATIONS* **15**.

Beghiah, A. *et al.* (2024). Investigating the proton translocation mechanism of complex i from the bottom-up. *BIOCHIMICA ET BIOPHYSICA ACTA-BIOENERGETICS* **1865**, 40–41. 22nd European Bioenergetics Conference (EBEC), Innsbruck, AUSTRIA, AUG 26-31, 2024.

Beghiah, A., Kemp, G., Saura, P., Kim, H., Berg, J., Auman, D. B. & Kaila, V. R. I. (2023). Investigating the proton translocation mechanism of complex i from the bottom-up. *EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS* **52**, S118.

Kemp, G., Saura, P., Berg, J., Auman, D. B. & Kaila, V. R. I. (2022). Investigating the proton translocation pathway in respiratory complex i from the bottom up. *BIOCHIMICA ET BIOPHYSICA ACTA-BIOENERGETICS* **1863**, 19–20. 21st European Bioenergetics Conference (EBEC), Aix en Provence, FRANCE, AUG 20-25, 2022.

Elfageih, R., Karyolaimos, A., Kemp, G., de Gier, J.-W., von Heijne, G. & Kudva, R. (2020). Cotranslational folding of alkaline phosphatase in the periplasm of escherichia coli. *PROTEIN SCIENCE* **29**, 2028–2037.

Kemp, G., Nilsson, O. B., Tian, P., Best, R. B. & von Heijne, G. (2020). Cotranslational folding cooperativity of contiguous domains of -spectrin. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* **117**, 14119–14126.

Kemp, G., Kudva, R., de la Rosa, A. & von Heijne, G. (2019). Force-profile analysis of the cotranslational folding of hemk and filamin domains: Comparison of biochemical and biophysical folding assays. *JOURNAL OF MOLECULAR BIOLOGY* **431**, 1308–1314.

Kemp, G. & Cymer, F. (2014). Small membrane proteins - elucidating the function of the needle in the haystack. *BIOLOGICAL CHEMISTRY* **395**, 1365–1377.

Mueller, M., Kunz, H.-H., Schroeder, J. I., Kemp, G., Young, H. S. & Neuhaus, H. E. (2014). Decreased capacity for sodium export out of arabidopsis chloroplasts impairs salt tolerance, photosynthesis and plant performance. *PLANT JOURNAL* **78**, 646–658.

Ullah, A., Kemp, G., Lee, B., Alves, C., Young, H., Sykes, B. D. & Fliegel, L. (2013). Structural and functional analysis of transmembrane segment iv of the salt tolerance protein sod2. *JOURNAL OF BIOLOGICAL CHEMISTRY* **288**, 24609–24624.

Kemp, G., Moncoq, K., Li, X., Fliegel, L. & Young, H. S. (2011). Studying human nhe1 structure, function, and regulation in vitro. *BIOCHEMISTRY AND CELL BIOLOGY-BIOCHIMIE ET BIOLOGIE CELLULAIRE* **89**, 283.

Kemp, G., Young, H. & Fliegel, L. (2008). Structure and function of the human na+/h+ exchanger isoform 1. *CHANNELS* **2**, 329–336.

Moncoq, K., Kemp, G., Li, X., Fliegel, L. & Young, H. S. (2008). Dimeric structure of human na+/h+ exchanger isoform 1 overproduced in saccharomyces cerevisiae. *JOURNAL OF BIOLOGICAL CHEMISTRY* **283**, 4145–4154.

Moncoq, K., Kemp, G., Fliegel, L. & Young, H. S. (2006). Expression, purification, and reconstitution of the human na+/h+ exchanger isoform 1 nhe1 in saccharomyces cerevisiae. *BIOCHEMISTRY AND CELL BIOLOGY-BIOCHIMIE ET BIOLOGIE CELLULAIRE* **84**, 1062.

Experience

Teaching & Mentoring

Lab coordinator and Lecturer, *Protein Structure and Function I (Masters' Level)*, 8 h lab. **Sept 2021**
Developed from scratch a new lab component for a redeveloped course (protein purification, CD, and ITC)

Bachelor's student supervisor. **May-Jun 2022**
Victoria Tunäng. Project: Engineering and functional characterization of designed minimal Hsp90 chaperone protein

Masters' student supervisor. **Jun-Aug 2021**
Zixin Rong. Project: Design, expression, purification, and functional assessment of a minimal bacterial complex I

Masters' student supervisor. **Jun-Aug 2021**
Mo Huang. Project: Expression and purification of a *De novo* designed transmembrane bundle protein containing a buried ion-pair followed by *in silico* design optimization

Lecturer, *Experimental Chemical Methods (Bachelor's Level)*, 6 h lectures, 6 h lab. **May 2021**
Introduction to protein structure determination and biological, medical and industrial applications

Lecturer, *Structural Biochemistry (Masters' Level)*, 6 h lectures. **Sept 2020**
Macromolecular Structure and Function, and Protein Folding

Bachelor's student supervisor, *Bachelor's Degree Project*. **2019**
Stefan Freigi, now a Laboratory Engineer at Fresenius Kabi Pharmaceuticals. Project: Mapping the cotranslational folding and processing of PhoA

Bachelor's student supervisor, *Research practicum course*. **2018**
Andrés de la Rosa, now a PhD student at Uppsala University, Sweden. Project: the Force-profile analysis of the cotranslational folding of HemK. **Co-authorship on Kemp, Kudva *et al.* JMB 2019**.

Bachelor's student supervisor, *Collaboration with Jillin University, China*. **2016**
Junru Li, went on to complete a Masters degree in Biomedical Engineering at Colombia University, NY. Project: Characterization of novel human small membrane proteins from the Uniprot database

Masters' student supervisor, *Funded by ERASMUS*. **2015**
Tamara Grund, currently a PhD student in Bayreuth, Germany. Project: Expression and characterization of novel small membrane proteins from human cells

Summer student supervisor, *Funded by the Alberta Heritage Foundation*. **2009**
Supervised Zachary Guenther, now a Graduate of radiology, University of Calgary (fellowship in Thoracic Imaging at Stanford). Project: The optimization of the expression and purification of the human Na^+/H^+ Exchanger in *Saccharomyces cerevisiae*

Science policy

Effect of the COVID-19 Pandemic: A national survey by the National Junior Faculty (NJF) in Sweden, *4th Gago Conference on Science Policy*. **Jun 13, 2022**
Presenter & rapporteur, Brussels, Belgium

We are disposable: A long-term survey of early-career researchers in Sweden, *Making Career Paths at Uppsala University more attractive*. **Oct 11, 2022**
Presenter & panelist, Uppsala, Sweden

Developing and sustaining effective researcher networks. **Sept 9, 2022**
Panelist, webinar (Liverpool, UK)

Administrative

Chair of the National Junior Faculty. **Sept 2021-2023**

Elected chair by the 9 member organizations. NJF coordinates a united voice working to improve Swedish Academia from the eyes of Early Career Researchers. @NJF_Sweden http://www.nationaljf.se/

Breakout Session moderator "Equality, Diversity, and Inclusion". **Nov 2020**
National Junior Faculty Conference: Sustainable Development of Future Academia

National Junior Faculty Conference: Sustainable Development of Future Academia. **2019-2020**
Planning committee member for our inaugural conference that gathered Early Career Researchers, funders, publishers, and academic leaders to propose a vision and plan for the sustainable future of academic research in Sweden.

(EM)bracing (for) Open Science, Panel discussion. **May 2019**
Was the primary organizer for a 2 hour panel discussion about strategies for Early Career Researchers to drive and benefit from the move to Open Science

National Junior Faculty Steering Committee member. **2019-2021**
Serving as a representative of the Stockholm University Young Faculty for Early Career Researchers in Sweden.

Secretary for the Stockholm University Young Faculty. **2018-present**
Executive role in planing events and advocating for Early Career Researchers at Stockholm University @SUYoungFaculty https://bit.ly/2OWARq9.

President Biochemistry Graduate Student Association. **2010–2012**
Local and provincial advocacy, student representative at departmental meetings, a founding member of biomedical science interdepartmental association

Student representative - Departmental Chair Review Committee. **2010**
Gauged student satisfaction with current chair and discussed issues with departmental, faculty and University officials

Vice-president Biochemistry Graduate Student Association. **2008–2009**
Organize student events, involved in local and provincial student advocacy

Outreach

Zoom a scientist, Uni Stockholm, *Birger Sjöberggymnasiet*, Vänersborg, Sweden. **Oct 2021**
Zoom lecture and Q&A on what is like to be a biochemist

Zoom a scientist, Uni Stockholm, *NTI Gymnasiet*, Gothenburg, Sweden. **Mar 2021**
Zoom lecture and Q&A on what is like to be a biochemist

Zoom a scientist, Uni Stockholm, *Widerströmska Gymnasiet*, Huddinge, Sweden. **Feb 2021**
Zoom lecture and Q&A on what is like to be a biochemist

Zoom a scientist, Uni Stockholm, *Kungsholmens Västra Gymnasium*, Stockholm, Sweden. **Feb 2021**
Zoom lecture and Q&A on what is like to be a biochemist

Skype a Scientist, *Kings Mountain Middle School*, Kings Mountain, NC, USA. **Feb 2020**
Skype lecture and Q&A on what is like to be a scientist

Skype a Scientist, *Russellville Middle School*, Russellville, AR, USA. **Oct 2019**
Skype lecture and Q&A on what is like to be a scientist

Management & training

The Fundamentals of OCAP training. **2025**
Completed the First Nations Information Governance Centre's course on the principles of Ownership, Control, Access, and Possession (OCAP) which assert First Nations' data sovereignty and information governance in Canada.

Workplace Violence and Harassment Prevention course. **2023**
Completed a course on recognizing, preventing, and reporting of workplace violence and harassment at the University fo Alberta.

Research and Cyber Security course. **2023**
Completed a series of courses on research and cyber security, covering awareness and tools for assessing threats and safeguarding research.

Evacuation Leader, Stockholm University. **2020**
Training to lead evacuation of University Buildings and practical course on extinguishing laboratory fires.

Established a new biochemistry lab. **2020**
Created chemical and equipment lists, carried out the procurement process for large equipment, relocated and set-up a 40 L bioreactor, and established standard laboratory operating procedures and safety protocols.

EMBO Laboratory Management for Postdocs, completed. **2017**
Soft skills course on mentoring, time-management, and conflict resolution.

Lab management. **2016-present**
Primarily responsible lab member for equipment maintenance and consumable ordering.

Seminars

Exploring your personal path of discovery: Navigating the winding maze of thorny rose bushes of research and innovation, *keynote*. **Apr 28, 2025**
5th Annual Eureka Undergraduate Research Symposium, University of Alberta, Canada

Monitoring the cotranslational folding of protein domains and their folding intermediates, *invited*. **Oct 4, 2023**
BIOCH 626 Seminar, University of Alberta, Canada

Hunting for small membrane proteins in *eukaryotic* cells, *invited*. **Nov 8, 2019**
CNRS Institut de Microbiologie de la Méditerranée, Marseilles, France

Picking up the Needles from the Haystack: Identification and characterization of novel small membrane proteins in eukaryotic cells, *selected abstract*. **April 13, 2018**
Canadian Society for Molecular Biosciences 61st Annual Meeting, Banff, Canada

Two's Company: Cooperativity in co-translational protein folding, *invited*. **April 6, 2018**
Biochemistry 626 seminar, University of Alberta, Edmonton, Canada.

Finding the Needles in the Haystack: explorations of the mammalian small membrane proteome, *selected abstract*. **May 11, 2017**
Biophysical Society: Membrane Receptor Organisation and Signal Transduction, Stockholm, Sweden

Studying the ubiquitous human sodium proton exchanger: from mice to to the test tube, *selected abstract*. **Sept 21, 2010**
2nd Joint Membrane Transport Symposium, Kaiserslautern, Germany

Studying human NHE1 structure, function and regulation *in vitro*, *invited*. **April 17, 2010**
Na^+/H^+ Exchanger Satellite Meeting at the 53rd Annual Meeting of the CSBMCB, Banff, Canada

Posters

Presenting author at an international meeting:
European Bioenergetics Conference EBEC (Aug 23, 2022, Aix-en-Provence, France)
CSMB 61st Annual Meeting (April 12, 2018, Banff, Canada)
FASEB Molecular Biophysics of Membranes (July 10, 2016, Snowmass, USA)
EMBO Mechanisms and regulation of protein translocation (March 21, 2015, Dubrovnik, Croatia)
Membrane Transport and Communication (September 29, 2014, Frankfurt, Germany)
International Research Training Group Jasper Symposium (August 28, 2012, Jasper, Canada)
2nd Joint Membrane Transport Symposium (September 21, 2010, Kaiserslautern, Germany)
GRC: Protons & Membrane Reactions (February 22, 2009, Ventura, CA)
53rd Annual Meeting of the CSBMCB (August 15, 2010, Banff, Canada)
52nd Annual Meeting of the Biophysical Society(February 2, 2008, Long Beach, CA)

Funding

Scholarships

CGS Doctoral award, *Canadian Institutes of Health Research*. **2010–2013**
$90,000, National competition

Walter H. Johns Graduate Fellowship, *University of Alberta*. **2011–2013**
$8,870, Tuition award for holding a national scholarship

Top-Up Funding, *Alberta Innovates - Technology Futures*. **2010–2013**
$30,000, Provincial award for holding a national scholarship

Doctoral award, *Alberta Heritage Foundation for Medical Research*. **2010–2012**
$43,000, Provincial competition (declined)

President's Doctoral Prize of Distinction, *University of Alberta*. **2010–2011**
$10,000, Tuition award for holding a national major doctoral scholarship

Doctoral award, *Alberta Heritage Foundation for Medical Research*. **2009–2010**
$20,000, Provincial competition

CGS Master's award, *Canadian Institutes of Health Research*. **2008–2009**
$17,500, National competition

Top-Up Funding, *Alberta Innovates - Technology Futures*. **2008–2009**
$12,500, Provincial award for holding a national scholarship

Queen Elizabeth II award, *University of Alberta*. **2008–2009**
$10,200, Local competition (declined)

Walter H. Johns Graduate Fellowship, *University of Alberta*. **2008–2009**
$4,435, Tuition award for holding a national scholarship

Alexander Rutherford Scholarship, *Government of Alberta*. **2003**
$2,500, Awarded to students who graduated with honours.

Research Allowances

Canadian Institutes of Health Research, *$15,000*. **2010–2013**

Alberta Innovates - Technology Futures, *$15,000*. **2010–2013**

Alberta Heritage Foundation for Medical Research, *$1,500*. **2009–2010**

Canadian Institutes of Health Research, *$5,000*. **2008–2009**

Languages

English: Complete fluency *Read/write/speak*

French: Some communication *Read/speak*

Swedish: Proficient *Read/write/speak*

Mentors

Dr. Howard S. Young
Professor, PhD supervisor
Department of Biochemistry
University of Alberta
E hyoung@ualberta.ca
T +1 780-492-3931

Dr. Larry Fliegel
Professor, PhD supervisor
Department of Biochemistry
University of Alberta
E lfliegel@ualberta.ca
T +1 780-492-1848

Dr. Gunnar von Heijne
Professor, Postdoctoral supervisor
Department of Biochemistry and Biophysics
Stockholm University
E gunnar.von.heijne@dbb.su.se
T +46 8 16 2590

Dr. Ville Kaila
Professor
Department of Biochemistry and Biophysics
Stockholm University
E ville.kaila@dbb.su.se
T +46 8 16 4240