JOSEPH FRANCIS CARDIELLO

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EDUCATION / TRAINING

9/2008 – 5/2012	**B.A.**	**Willamette University,** Salem, OR USA	*Major*: Chemistry (Biochemistry Track) *Minor*: Mathematics
8/2012 – 12/2018	**Ph.D.**	**University of Colorado,** Boulder, CO USA	Department of Chemistry and Biochemistry (Biochemistry Track)
10/2018 – 4/2021	**Postdoc**	**University of Colorado,** Boulder, CO USA	BioFrontiers Institute (Bioinformatics)
5/2021 – ongoing	**Postdoc**	**Lund University,** Lund, SE	Department of Molecular Medicine (Immunology, Salamander Regeneration)

RESEARCH EXPERIENCE

5/2021 – ongoing **Lund University, Department of Molecular Medicine**, Lund SE
Postdoctoral Researcher

Advisor: Nicolas Leigh
Collaborators: András Simon Lab (Karolinska Institute)
Role Description: The Leigh lab studies salamanders, which can regenerate limbs and other organs for their entire lives. Our lab is investigating the relationship between the immune system and the regenerative capacity of salamanders. My initial projects involve applying next generation sequencing techniques and imaging tools to salamander cellular dedifferentiation, and salamander specific antibody discovery for adapting human centric immunology tools to work in this non-model species.

10/2020 – 3/2021 **University of Colorado at Boulder, BioFrontiers Institute**, Boulder CO
BioFrontiers Sequencing Core Senior Scientist

Advisors: Professors Mary Allen and John Rinn
Role Description: I was hired by BioFrontiers to help run the sequencing core during a planned absence by the Next-Gen Sequencing Facility Director Amber Scott. My responsibilities in this position included preparing sequencing libraries for research labs including RNA-seq and Amplicon sequencing. I was responsible for consulting with and advising researchers to plan sequencing experiments, guiding labs in assessing the quality of their sequencing libraries prior to sequencing, running the sequencing instruments, and saving/transferring sequencing data to labs. I was approached about a full-time position for this job but negotiated this role to be part time so that I could use ~2 days per week to continue making progress to complete projects from my first postdoctoral role, listed below.

10/2018 – 4/2021 **University of Colorado at Boulder, BioFrontiers Institute**, Boulder CO
Sie Foundation Postdoctoral Fellow

Advisors: Professors Mary Allen and Robin Dowell
Research Focus: I led two projects investigating the effects of Down syndrome on gene expression in cells. In one project I applied a suite of sequencing-based techniques to study whether trisomy 21 alters the heat shock response in cell lines. I conducted and analyzed ATAC-seq, PRO-seq, and scRNA-seq experiments at paired conditions to carefully assess how chromatin accessibility, transcription, and steady state RNA levels were observed to change across a population of cells, and to learn about how comparisons between these data types might lead to new insights into gene regulation. I have also been involved in planning, coordinating, and conducting research on a team project investigating whether Down syndrome alters the transcription or RNA degradation processes involved in the early timepoints in iPSC differentiation to hemopoietic lineages.

In addition to working on the above two projects for the Dowell lab, I led a series of ATAC-seq experiments and analysis on heart tissue from a python species as part of a collaborative project in the lab of Leslie Leinwand.

9/2012 – 9/2018 **University of Colorado at Boulder, Dept. of Chemistry**, Boulder CO.
Graduate Research Assistant

Advisors: Professors James Goodrich and Jennifer Kugel
Research Focus: Conducted research on two separate transcription related projects. In one project, Pol II ChIP-seq was used to study patterns in the global transcriptional response to heat shock and heat shock recovery in mouse cells. In this project I found that heat shock was causing a loss of transcription termination at many genes, and that this loss of termination is reversible. For my second project, I studied a murine non-coding RNA, B2 RNA, that regulates transcription after stress, and investigated proteins that specifically bind an extended form of the RNA (eB2 RNA).

5/2011 – 5/2012 **Willamette University, Department of Chemistry**, Salem OR
Student Collaborative Research Project (SCRP program) Summer Fellowship

Advisor: Professor Alison Fisher
Research Focus: I was awarded the competitive summer SCRP fellowship to conduct research in Dr Fisher's lab and granted the opportunity to continue the research through an academic year to complete a thesis purifying and characterizing the first documented isoprene synthase from a moss (*Campylopus introflexus*).

8/2010 – 5/2011 **Willamette University, Department of Chemistry**, Salem OR
Undergraduate Research Assistant

Advisor: Professor Scott Meyers
Research Focus: Used NMR and solid phase peptide synthesis to study the effects of changing individual amino acids on the pKa of small polypeptides.

TEACHING, SERVICE, AND MENTORSHIP

1/2023-5/2023 ***Visiting Assistant Professor in Dept of Chemistry and Biochemistry, Colorado College***
Hired to teach three class blocks of general chemistry courses.

10/2021 ***Lab Instructor for BIMM01 (Experimental Design and Scientific Communication), 48 Hours of teaching, Lund University***
Developed and supervised a research oriented lab project for students in this preliminary course of LU's Masters program in biomedicine.

6/2020 – 8/2020 ***Developed Curriculum for Introductory Course to STEM and Biomimetics***.
Took part in a 7-week course on "Turning your research into teaching", a course offered to graduate students at CU Boulder. I designed a full course to introduce university students with no formal scientific background to the unique ways that various science and engineering fields view and investigate the world, and the diverse kinds of creative projects involved in various research careers. The course is a hands on, project based tour of the STEM fields that contribute to biomimetic discoveries and biomimetic inspired design.

7/2019 ***Short Read Sequencing Workshop Instructor, University of Colorado***
The Dowell/Allen lab runs a well-attended workshop each summer to teach graduate students and postdoctoral researchers to analyze their own short read data. I planned and taught one day of this workshop focusing on ChIP-seq and ATAC-seq data.

8/2019 ***Completed Evidence-Based Instruction to Teaching Course***
Participated in a one week course on evidence based teaching. This hands on course was attended by postdocs in STEM fields from around the U.S. who were interested in learning about how to incorporate evidence-based teaching methods into their future curriculum.

6/2015 – 5/2019 ***Research Mentor for 3 Biochemistry PhD Candidates, 1 Undergraduate Student***
(1) Mentored a biochemistry rotation student in the Dowell/Allen lab, Taylor Jones, helped to plan experiments and analyze sequencing data.
(2) Mentored two biochemistry rotation students in the Goodrich/Kugel Lab: Tom Rivas, and Dan Beideman, and an undergraduate student: Isabelle Boucher to plan experiments, optimize assays, and interpret experimental results.

8/2012 – 5/2013 ***Teaching Assistant in General Chemistry, University of Colorado***
Taught and graded undergraduate labs, lectured students in recitation classes, and facilitated group work.

8/2010 – 5/2012 ***Teaching Assistant for Organic Chemistry Lab, Willamette University***
Assisted students in lab by answering questions and explaining new procedures, graded all lab reports.

1/2010 – 5/2010 ***Co-Chair of Education Committee at Kaneko Commons, Willamette University***
Booked and facilitated a variety of educational panels and discussions for students at Willamette University.

1/2009 – 5/2009 ***Multivariable Calculus Tutor, Willamette University***
Hired by Willamette University to tutor students individually in multivariable calculus.

9/2008 – 5/2010 ***Math and Reading Tutor, Bush Elementary School, Salem OR***
Tutored groups of elementary school students in basic reading and math skills in a bilingual classroom during school hours and in the after school 'Tiger Club'

CAREER DEVELOPMENT

Lund Stem Cell Center Flow Cytometry continuation course	Lund University 2022
Wallenberg Centre Research School	Lund University 2021-22
Research Supervision course	Lund University 2022
Lund Stem Cell Center Flow Cytometry I course	Lund University 2021
Laboratory Animal Sciences - Aquatic Amphibians	Lund University 2021
Swedish Legislation & Ethics, Animal Welfare and 3R	Lund University 2021
Stem Cells and Regeneration course	Marine Biology Lab 2021

AWARDS & HONORS

Royal Physiographic Society of Lund Postdoc travel grant	Lund University 2022
1st Place Collaborative Grant at WCMM Research School	Lund University 2022
Sie Foundation Postdoctoral Fellowship	CU Boulder 2018-2020
Signaling and Cellular Regulation NIH training grant	CU Boulder 2013-2015
SCRP Summer Fellowship	Willamette University 2011
Seeger Science Scholarship	Willamette University 2011
Florian Von Eschen Scholarship for Chemistry	Willamette University 2010
Taul Watanabe Science Scholarship	Willamette University 2009

PUBLICATIONS

Cardiello, J., Joven Araus, A., Giatrellis, S., Simon, A., Leigh, N. Accurate genotype-based demultiplexing of single cell RNA sequencing samples from non-human animals. **2022.** *Submitted to Biorxiv and Review Commons September 22, 2022.* **doi:** https://doi.org/10.1101/2022.09.22.508993

Cardiello, JF., Westfall, J., Dowell, RD., Allen, MA. Robust short-term response to heat shock in a Trisomy 21 cell line. **2022.** *In Preparation, to be submitted to eLife November 2022.*

Crocini C., Woulfe KC., **Cardiello JF.**, Perni S., Walker CJ., Ozeroff CD., Dowell R., Allen MA., Leinwand LA. Physiological cardiac hypertrophy is supported by a concert of functional, genetic, and epigenetic cellular mechanisms in pythons. **2022**. *In Preparation*.

Cardiello JF., Sanchez GJ., Allen MA., Dowell RD. Lessons from eRNAs: understanding transcriptional regulation through the lens of nascent RNAs. Transcription. **2020**. doi: 10.1080/21541264.2019.1704128

Cardiello J., Goodrich J., Kugel J. Heat shock causes a reversible increase in RNA polymerase II occupancy downstream of mRNA genes, consistent with a global loss in transcriptional termination. Molecular Cellular Biology. **2018**. doi: 10.1128/MCB.00181-18.

Lantz A., **Cardiello J**., Gee T., Richards M., Rosenstiel T., Fisher A. Biochemical characterization of an isoprene synthase from *Campylopus introflexus* (heath star moss). Plant Physiology and Biochemistry. **2015**. doi: 10.1016/j.plaphy.2015.06.008

Cardiello J., Kugel J., Goodrich J. A new twist on cell growth control. Cell Cycle News & Views. **2014**. doi: 10.4161/15384101.2014.980702

Li, Y.*, Smith, C.*, Wu, H., Shruti, P., Manoj, N., **Cardiello, J.,** Qiao, Q., Cao, C., Yin, H., Cai., J.. Lipidated cyclic γ-AA peptides as a new class of AMP mimics that display both antimicrobial and anti-infective activity. ACS Chem. Biol. **2014**. doi: 10.1021/cb4006613 *These authors contributed equally.

PRESENTATIONS

"Genetics-based demultiplexing of pooled samples is an accurate approach to produce scRNA-seq replicates in a wide variety of species" **Lund Stem Cell Center: Next Gen Seminar Series.** Oral presentation. Lund University. November 2nd, 2022.

Cardiello, J., Joven, A., Giatrellis, S., Simon, A., Leigh, N. Analysis of the accuracy of SNP based demultiplexing of pooled single-cell RNA-seq samples from nontraditional model species. **EMBO: The Molecular and Cellular Basis of Regeneration and Tissue Repair.** Poster presentation. Barcelona. September 2022.

"Investigating the impact of Down syndrome on cell to cell variability in the heat shock response" **Single Molecules and Single Cells (SMSC) SCR supergroup meeting**. Oral presentation. CU Boulder. February 17th, 2020.

"Investigating the effects of Down syndrome on the induction of heat shock responsive gene mRNAs across a cellular population" **RNA Bioscience Initiative: An evening with RNA meeting**. Oral presentation. CU Anschutz. January 21st, 2020.

"Heat shock causes a reversible increase in RNA polymerase II occupancy downstream of mRNA genes consistent with a global loss in transcriptional termination" **Signaling and Cellular Regulation Symposium.** Oral presentation. CU Boulder. May 14th, 2018.

"Investigating a heat shock induced transcriptional termination defect: a new source of stress induced elongated mRNAs." **RNA Bioscience Initiative: An Evening with RNA Meeting**. Oral presentation. CU Anschutz. February 6th, 2018.

"3' extension of B2 RNA alters its interactions with Pol II and other nuclear proteins." **Regulatory & Noncoding RNAs Conference**. Poster presentation. Cold Spring Harbor. August 23rd – 27th, 2016.

"Search for a factor that dissociates B2 RNA from RNA Polymerase II." **Signaling and Cellular Regulation Supergroup Meeting**. Oral Presentation. CU Boulder. February 9th, 2015.

"Identifying regulators of transcriptional repression by B2 RNA." **University of Colorado Biochemistry Department Retreat.** Oral Presentation. Winter Park CO. September 6th – 8th, 2013.

"Enzymatic synthesis of isoprene in a high temperature moss." **Murdock Conference**, Poster Presentation. Seattle University, November 11th and 12th 2011.