John W. Tullai, Ph.D.

Lecturer in Biology

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Boston University, Dept. of Biology
5 Cummington Mall, Boston, MA 02215

EDUCATION

Postdoctoral Fellow 2001-2007
Boston University, Department of Biology, Boston, MA
Integrated experimental and systems biological/genomic methodologies to study the transcription regulation of phosphatidylinositol-3-kinase (PI3K)/Akt-mediated survival signals and induction of apoptosis in human cell models.

Ph.D., Biomedical Sciences, Subarea: Neurobiology January, 2001
Mount Sinai School of Medicine of New York University, New York, NY
Post-translational regulation of the neuropeptide processing enzyme EC 3.4.24.15
Advisors: James L. Roberts, Ph.D., and Marc J. Glucksman, Ph.D.

B.A., Biology 1992
Columbia University, Columbia College, New York, NY

PROFESSIONAL EXPERIENCE

Lecturer in Biology September 2018-present
Boston University, College of Arts and Sciences (CAS), Department of Biology, Boston, MA
Head Teaching Fellow, Systems Physiology Laboratory (BI315)
Systems Physiology Laboratory Curriculum Development Team
Cell and Molecular Biology with concentration in Genetics major Academic Advisor

Research Assistant Professor November 2007-August 2018
Boston University, Department of Biology, Boston, MA
Investigated PI3K/Akt/Glycogen synthase kinase-3 (GSK-3)-mediated transcription regulating the induction of cardiomyocyte hypertrophy and apoptosis in primary culture models.

Senior Research Associate 2006-2007
Research Associate 2001-2006
Boston University, Department of Biology, Boston, MA
Postdoctoral Fellow in the laboratory of Geoffrey M. Cooper, Ph.D. Integrated experimental and systems biological/genomic methodologies to study the transcription regulation of phosphatidylinositol-3-kinase (PI3K)/Akt-mediated survival signals and induction of apoptosis in human cell models.

Graduate Student 1994-2001
Mount Sinai School of Medicine of New York University, New York, NY
Investigated the protein biochemistry, enzymology and cellular aspects of the regulation of the peptide-metabolizing enzyme EC 3.4.24.15, an enzyme with important neuroendocrine regulatory roles in mammalian reproductive control and cardiovascular function. First to establish that the enzyme is regulated by PKA phosphorylation. Delineated its subcellular trafficking with novel fractionation methodologies (Balch Cell Cracker).

Research Coordinator 1992-1994
Mount Sinai School of Medicine, Fishberg Research Center for Neurobiology, New York, NY
Laboratory of John H. Morrison, Ph.D. Designed and characterized subunit-specific glutamate and dopamine receptor antibodies for use in neuroanatomical studies of non-human primate and rodent models.

TEACHING EXPERIENCE

Boston University, College of Arts and Sciences, Boston, MA:

Course Co-Director, CAS BI108, Biology II, Cells, Genetics, Development and Physiology ***Jan 2019-***
This introductory level course examines cells, genetics, development, physiology, and neurobiology. Course enrollment in excess of 260 students.

Head Teaching Fellow, Systems Physiology Laboratory ***Sept 2017-present***
Train new Teaching Fellows (TFs) in STEM Pedagogy, Bloom-based examination design, scoring and experimental procedures in Systems Physiology Laboratory (BI315). Serve as a teaching mentor to new TFs as well as undergraduates participating in the Learning Assistant (LA) program. Teach 150+ students each academic year in Systems Physiology Laboratory.

Course Co-Director, Carcinogenesis (BI576) **2016-present**
Covering multiple aspects of cancer biology with a focus on molecular mechanisms underlying cancer development and progression, and implications for therapy. Topics include oncogenes, tumor suppressors, apoptosis, angiogenesis, metastasis, and chemotherapy.

Instructor, Systems Physiology Laboratory (BI315) **Spring 2016-present**
Topics include homeostasis and neural, muscle, respiratory, cardiovascular, renal, endocrine, gastrointestinal and metabolic physiology.

Boston University, Metropolitan College, Boston, MA:

Course Director, MET BI108, Biology II, Cells, Genetics, Development and Physiology ***Spring 2017-present***
This introductory level course examines cells, genetics, development, physiology, and neurobiology.

Course Director, Cell Biology (MET BI203) **Fall 2015-present**
Principles of cellular organization and function: biological molecules, enzymes, bioenergetics, flow of genetic information, membranes and subcellular organelles, motility and regulatory mechanisms.

Boston University Summer Term, Boston, MA:
Course Director, Carcinogenesis (BI576) ***Summer I 2018-present***
Covering multiple aspects of cancer biology with a focus on molecular mechanisms underlying cancer development and progression, and implications for therapy. Topics include oncogenes, tumor suppressors, apoptosis, angiogenesis, metastasis, and chemotherapy. Conducting all lectures and primary literature Discussions.

Instructor, Academic Immersion (AIM): Introduction to Medicine **Summer II 2015-present**
Taught rising high school juniors and seniors. Central in designing a broad introduction to the field of medicine combining coursework in related sciences (Anatomy and Physiology, Infectious Diseases and Contemporary Issues in Medicine) and experiential learning activities in collaboration with the Dept. of Medical Sciences and Education at the BU School of Medicine. Designed seminar curriculum, taught seminar series.

Boston University, College of Arts and Sciences, Boston, MA:

***Invited Lecturer,* Molecular Biology II (BI553)** **Spring 2015**
Lectured senior level undergraduates and Ph.D. students covering molecular and cell biological aspects of antisense RNA/RNAi.

***Discussion Leader,* Cell Biology (BI203)** **Fall 2014**
Directed weekly discussion sections with undergraduate students covering in-depth "key experiments" correlated with BI203 from published literature. Wrote quizzes and provided student support. Covered eight sections totaling 142 students.

***Invited Lecturer,* Molecular Biology II (BI553)** **Spring 2003, 2004, 2008**
Lectured senior level undergraduates and Ph.D. students covering molecular and cell biological aspects of apoptosis signaling pathways.

***Teaching Fellow,* Molecular Biology II (BI553)** **Spring 2003, 2004, 2008**
Directed weekly discussion sections with Ph.D. students covering current published literature.
Lectured senior level undergraduates and Ph.D. students covering apoptosis signaling pathways.

***Invited Lecturer,* Molecular Biology II (BI553)** **Spring 2002-2004**
Lectured Masters students in practical applications of DNA microarray analysis and Proteomic technologies.

Mount Sinai School of Medicine, New York University, New York, NY:

***Teaching Assistant*, Principles of Neurobiology I Journal Club** **2000**
Instrumental in the creation and implementation of a classic literature journal club for the Principles I (Molecular/Cellular Neurobiology) Course. Coordinated presentations, assisted students in critical reading of papers and presentation preparation, conducted recitation sessions.

***Instructor*, Introduction to Journal Club: Core 1/Biochemistry and Molecular Biology** **1999**
Team-taught first year graduate students in critical evaluation of literature, methods of seminar presentation.

***Instructor*, Qualifying Examination Tutorial, Neuroscience Training Program** **1997-1999**
Tutored in general Neuroscience Principles, taught/coached methodologies for taking oral examinations, administered mock oral examinations.

***Teaching Assistant*, Principles of Neurobiology II** **1995**
Tutored students and conducted recitation sessions in Systems Neuroscience.

MENTORING, TRAINING AND SUPERVISION

Academic Advisor: *Cell and Molecular Biology with concentration in Genetics major* **September 2018-present**
Provide guidance and academic advising to Boston University undergraduate Biology CMG majors.

Research for Credit Sponsor, Boston University, Department of Biology **January-May 2017**
Acting as the Boston University liaison to monitor the research progress of undergraduate Gabrielle Pilla, who is conducting work at the University of Pennsylvania, "Mechanical Properties in a Myocardial Infarction using MRI to Reverse Remodeling" with Professor Robert Gorman.

Research Mentor, Boston University, Department of Biology **September 2016-present**
Provide feedback in lab meeting and laboratory setting to graduate and undergraduate researchers in the laboratory in fundamentals of cancer biology as applied to the studies in the potential causation in hepatocellular carcinoma.

Principal Investigator, Boston University, Department of Biology **2009-2016**
With funding from the American Heart Association, directed a team of undergraduate and Master's Degree students to investigate PI3K/Akt/Glycogen synthase kinase-3 (GSK-3)-mediated transcription regulating the induction of cardiomyocyte hypertrophy and apoptosis in primary culture models. More than ten undergraduate students participated in this work.

Mentor/Supervisor, Lab of Geoffrey M. Cooper, Ph.D. (*Professor Emeritus*) **2001-2016**
Provided direct laboratory training and supervision to more than fifteen Ph.D. students and thirteen undergraduate students in the areas of Biology, Cell & Molecular Biology, Molecular Biology, Cell Biology & Biochemistry, and Bioinformatics.

Laboratory Safety Coordinator **9/2012-present**
Supervise all laboratory and worker safety practices in daily operations. Instruct all lab personnel in safe work methods and of the hazards associated with laboratory operations. Serve as the primary contact to Environmental Health and Safety regarding issues of safety (Biological, Chemical, Fire and General Safety).

Radiation Safety Laboratory Supervisor **6/2011-present**
Supervise all laboratory use of radioisotopes. Instruct lab personnel in safe work methods with radioisotope use and all associated hazards. Ensure compliance with State and Federal agencies regarding radioisotope use, contamination control, disposal logs and inventory control. Serve as the primary contact to the Radiation Protection Office regarding issues of Radiation Safety, training and compliance.

COMMITTEE ASSIGNMENTS AND SERVICE

First Reader*, School of Graduate Medical Sciences, Boston University School of Medicine* **Nov 2018-present**
Fernanda Behzadi, Master of Arts in Medical Sciences
" Therapeutic potential of targeting the oncofetal protein ROR1"

Faculty Facilitator, **Responsible Conduct in Research Program/Bioethics** **Fall 2007-present**
Facilitated discussion groups in Boston University's Responsible Conduct in Research Program covering topics including maintenance of a proper research record, publication and collaboration ethics, objectivity in research, and conflict of interest and scientific misconduct issues.

First Reader*, Master's Level Dissertation, Boston University* **December 2012-May 2015**
Sean Sepulveda, Graduate School of Arts and Sciences, Master of Arts
"Role of GSK-3 in CREB-mediated transcription regulation, hypertrophy and survival in cardiomyocytes"

Doctoral Thesis Committee Member, Boston University **December 2012-January 2018**
Jose-Luis Medrano, Molecular Biology, Cell Biology and Biochemistry Ph.D. student.
"Characterizing the role of MEF2A in cardiac atrial chambers"
First Reader: Dr. Frank Naya

First Reader*, Masters Level Dissertation,* Boston University **December 2012-May 2015**
Sean Sepulveda, Graduate School of Arts and Sciences, Master of Arts

"Role of GSK-3 in CREB-mediated transcription regulation, hypertrophy and survival in cardiomyocytes"

Boston University Task Force on Research Faculty **1/2012-12/2012**
Nominated by the Biology Department Chair to participate in a Task Force to produce a report to the Dean of the College of Arts and Sciences making specific recommendations on changes in policy and procedures that govern Research Faculty development and support.

***First Reader**, Masters Level Dissertation,* Boston University **August, 2012**
James F. Brennan, Graduate School of Arts and Sciences, Master of Arts
"*Gene Regulation Downstream of GSK-3 in Neonatal Rat Ventricular Myocytes and T98G Cells"*

***Doctoral Thesis Committee Member**,* Boston University **May 2008-January 2012**
Christine Snyder, Molecular Biology, Cell Biology and Biochemistry Ph.D.
"Wnt Signaling in Skeletal Muscle Regeneration is Modulated by a Mef-2A Dependent miRNA Mega-Cluster"
First Reader: Dr. Frank Naya

***Doctoral Thesis Defense Committee Member**,* Boston University **October, 2010**
Elizabeth Braverman Ewen, Biology Ph.D.
"MEF2A Coordinately Regulates a Costamere Gene Program in Cardiac Muscle" First Reader: Dr. Frank Naya

***Ad Hoc* Reviewer** for *Journal of Biological Chemistry, Journal of Clinical Chemistry, Genome Biology, Neurobiology of Aging, PLoS ONE, Nutrients.* **2003-present**

***Created a proteomics core facility for the Charles River Campus of Boston University*:** **2001-2012**
Investigated and procured funds and instrumentation, implemented training.

OUTREACH AND VOLUNTEERISM

Panelist, Berwick Academy (South Berwick, Maine) Innovations Program **May 2015-present**
Acted as a panelist (Judge) for the Innovations Celebration, where participating students present and defend a thesis of their choice in their area of study. Middle school through High School levels.

Science Fair Judge at Coastal Ridge Elementary School (York, ME) **2011-2016**

Conducted science outreach programs in York, ME Public Schools. **2009-2016**
Conducted and guided hands-on science demonstrations with students in Preschool, and Grades 1, 2 and 3.

Alumni Recruitment Committee Representative, Columbia University in the City of New York **1994-present**
Conduct interviews in Southern Maine and internationally (Skype) for Columbia University undergraduate admissions.

PROFESSIONAL ORGANIZATIONS

Member, American Biology Laboratory Educators (ABLE) **2014-present**
Member, American Heart Association **2012-present**
Member, American Society for Biochemistry and Molecular Biology (FASEB) **1997-present**
Member, American Association for the Advancement of Science **1996-present**
Member, Society for Neuroscience **1994-present**

AWARDS AND FELLOWSHIPS

0835284N ($308,000) J.W. Tullai, PI **2008-2012**
American Heart Association, Scientist Development Grant
Global Transcription Analysis of GSK-3 Signaling in Regulation of Cardiomyocyte Hypertrophy; *Role: PI*

IRG-72-001-33-IRG ($24,000) D.V. Faller, PI **2007-2008**
American Cancer Society, Institutional Research Grant (Boston University)
Regulation of GSK-3 Transcriptional Targets NFAT and AP-1; *Role: Project Investigator*

F31 GM67392 ($126,000) J.W. Tullai, Postdoctoral Fellow **2003-2005**
NIH/Ruth L. Kirschstein National Research Service Award (NRSA)
Transcriptional Regulation by PI 3-kinase/Akt Signaling; *Role: Kirchstein-NRSA Postdoctoral Fellow*

NIH Molecular and Cellular Endocrinology Training Grant; *Role: Predoctoral Fellow* **1996-2000**

NIH Young Investigator Short Talk Award **1998**
Fully funded to attend and give a research talk at the *Gordon Research Conference: Hormonal and Neural Peptide Biosynthesis.*

BOOK PUBLICATIONS

Boston University BI315 Systems Physiology Laboratory Manual. Parthena Sanxaridis Mantis, **John W. Tullai**, Angela Seliga. Hayden-McNeil, 2018

JOURNAL PUBLICATIONS

S. Kletsov, T. Edwards-Grant, B. Carley, **J.W. Tullai** and K.W. Adams (2019) Phosphorylation of NAB2 through ERK signaling in response to nerve growth factor. *In preparation.*

J.W. Tullai†, M.E. Moss, S.M. Sepulveda, J.F. Brennan, F.J. Naya and G.M. Cooper, (2019) Role of GSK-3 in CREB-mediated transcription regulation, hypertrophy and survival in cardiomyocytes. *In revision.* ***†Corresponding Author***

J.W. Tullai, J.R. Graham, G.M. Cooper (2011) A GSK-3-mediated transcription network maintains repression of immediate early genes in quiescent cells. *Cell Cycle.* 10 (18): 3072-3077. *Review Article.*

J.W. Tullai, L. J. Owens, S. Tacheva, J.R. Graham, and G.M. Cooper (2011) AP-1 is a Component of the Transcriptional Network Regulated by GSK-3 in Quiescent Cells. *PLoS ONE.* 6(5):e20150.

J.R. Graham, **J.W. Tullai** and G.M. Cooper (2010) GSK-3 represses growth factor-inducible genes by inhibiting NF-κB in quiescent cells. *J. Biol. Chem.* 285: 4472-4480.

J. Terragni, J. R. Graham, M.E. Schaffer, **J.W. Tullai**, and G.M. Cooper. (2008) The roles of forkhead and NFκB in the transcription regulation of the phosphatidylinositol 3-kinase pathway. *BMC Cell Biol*. 9: 6.

J.W. Tullai, M.E. Schaffer, S. Mullenbrock, G. Sholder, S. Kasif and G.M. Cooper. (2007) Immediate-early and delayed primary response genes are distinct in function and genomic architecture. *J. Biol. Chem.* 282: 23981-95.

J.W. Tullai, J. Chen, M.E. Schaffer, E. Kamenetsky, S. Kasif, and G.M. Cooper. (2007) Glycogen synthase kinase-3 represses cyclic AMP response element-binding protein (CREB)-targeted immediate early genes in quiescent cells. *J. Biol. Chem.* 282: 9482-91.

J.W. Tullai, M.E. Schaffer, S. Mullenbrock, S. Kasif and G.M. Cooper. (2004) Identification of transcription factor binding sites upstream of human genes regulated by the phosphatidylinositol 3-kinase and MEK/ERK signaling pathways. *J. Biol. Chem*. 279: 20167-77.

J.W. Tullai, P.M. Cummins, A. Pabon, J.L. Roberts, M.C. Lopingco, C.N. Shrimpton, A.I. Smith, J.A. Martignetti, E.S. Ferro, and M.J. Glucksman. (2000) The neuropeptide processing enzyme EC 3.4.24.15 is modulated by protein kinase A phosphorylation. *J. Biol. Chem.* 275: 36514-22.

E.S. Ferro, **J.W. Tullai,** M.J. Glucksman, J.L. Roberts. (1999) Secretion of metalloendopeptidase 24.15 (EC 3.4.24.15). *DNA Cell Biol.* 18: 781-9.

P.J. Crack, T.J. Wu, P.M. Cummins, E.S. Ferro, **J.W. Tullai,** M.J. Glucksman, J.L. Roberts. (1999) The association of metalloendopeptidase EC 3.4.24.15 at the extracellular surface of the AtT-20 cell plasma membrane. *Brain Res.* 835: 113-24.

J. Li, **J.W. Tullai**, W.A. Yu, and S.R.J. Salton. (1998) Regulated expression of the mRNAs encoding the receptor tyrosine phosphatase zeta/beta during development and following sciatic nerve injury. *Mol. Brain Res.* 60: 77-88.

C.N. Shrimpton, M.J. Glucksman, R.A. Lew, **J.W. Tullai,** E.H. Margulies, J.L. Roberts, and A.I. Smith. (1997) Thiol activation of endopeptidase EC 3.4.24.15: A novel mechanism for the regulation of catalytic activity. *J. Biol. Chem.* 272: 17395-17399.

S.J. Seigel, W.G. Janssen, **J.W. Tullai**, S.W. Rogers, T. Moran, S.F. Heinemann, and J.H. Morrison. (1995) Distribution of the excitatory amino acid receptor subunits GluR2(4) in monkey hippocampus and colocalization with subunits GluR5-7 and NMDAR1. *J. Neurosci.* 15: 2707-2719.

SELECTED MEETING PRESENTATIONS

J.W. Tullai, S. Sepulveda, J.F. Brennan, M.E. Moss, F. J. Naya and G.M. Cooper. Inhibition of GSK-3 activates CREB transcriptional targets during induction of cardiomyocyte hypertrophy. Experimental Biology, Boston, MA, April 2013.

J.W. Tullai, J. Chen, M.E. Schaffer, E. Kamenetsky, S. Kasif, and G.M. Cooper. GSK3β mediates gene expression downstream of PI3K/Akt signaling via regulation of CREB. *FASEB Summer Research Conference: Transcription Regulation during Cell Growth, Differentiation & Development.* Saxtons River, VT, 2006.

J.W. Tullai, M.E. Schaffer, S. Kasif and G.M. Cooper. Identification of transcription factor binding sites in the promoter regions of human genes regulated by the PI3-kinase/Akt and MEK/ERK signaling pathways. *Cold Spring Harbor Systems Biology Meeting: Genomic Approaches to Transcriptional Regulation.* Cold Spring Harbor, NY, 2003.

J.W. Tullai, M. E. Schaffer, S. Kasif and G.M. Cooper. Transcriptional profiling of PI3K/Akt and ERK signaling pathways in human glioblastoma cells. *Experimental Biology: American Society for Biochemistry and Molecular Biology Conference.* San Diego, CA, 2003.

J.W. Tullai, P.M. Cummins, J.L. Roberts, M.J. Glucksman. The neuropeptide processing enzyme EC 3.4.24.15 (EP24.15) is modulated by protein kinase A phosphorylation. *Gordon Research Conference: Hormonal and Neuropeptide Biosynthesis.* New London, NH, 2000.

J.W. Tullai, P.J. Crack, M.J. Glucksman, and J.L. Roberts. Trafficking Studies of the Processing Peptidase EC 3.4.24.15. *Gordon Research Conference: Hormonal and Neural Peptide Biosynthesis.* New London, NH, 1998.

J. W. Tullai, P.M. Cummins, J.L. Roberts, and M. J. Glucksman. PKA phosphorylation introduces alterations in the catalytic activity of endopeptidase EC 3.4.24.15. *Soc. Neurosci. Abst.* New Orleans, LA, 1997.

J. W. Tullai, E. Ferro, P.J. Crack, E.H. Margulies, A.I. Smith, J.L. Roberts, and M. J. Glucksman. Phosphorylation as a putative regulatory mechanism for the catalytic activity of endopeptidase EC 3.4.24.15. *International Congress of Endocrinology Abst.* San Francisco, CA, 1996.

J.W. Tullai and G.W. Huntley. Differential patterns of intrinsic motor cortex projections as a substrate for cortical motor map plasticity. *Soc. Neurosci. Abst.* San Diego, CA, 1995.

INVITED SEMINARS

Basics of the Urinary Tract and Renal Function; Neuroendocrine Function via the Hypothalamus and Pituitary. Invited as a finalist for Physiology Lecturer position, Boston University Department of Biology, Boston, MA. April 2017.

From Literature to Neurons to cancer cell signaling-my personal and professional trajectory as a scientist. Undergraduate FISH ("Friday Informal Seminar Hour") series, Bridgewater State University, Bridgewater, MA. Bartlett College of Biological Sciences. February, 2015.

Transcriptional Profiling of PI3K/Akt Signaling Pathways in human glioblastoma cells. American Society for Biochemistry and Molecular Biology (FASEB): Functional Genomics Session. Experimental Biology Conference, San Diego, CA, April, 2003.

Biochemical and Cell Biological Studies of the Processing Peptidase EC 3.4.24.15. Baker Medical Research Institute, Peptide Biology Group, Melbourne, Australia, October 1999.

PKA Phosphorylation and Trafficking Studies of the Processing Peptidase EC 3.4.24.15. Univ. of North Carolina, Chapel Hill, Dept. of Cell and Molecular Physiology, October 1998.

Trafficking Studies of the Processing Peptidase EC 3.4.24.15. Gordon Research Conference: Hormonal and Neural Peptide Biosynthesis. NIH Young Investigator Short Talk award, August 1998.

SPECIALIZED TRAINING IN TEACHING AND STUDENT SUPPORT

Title IX, Sexual Misconduct, & Advising: What you need to Know (October 2018). Boston University Office of the Provost required training.

Fostering Academic Success in STEM conference (April 2017). Center for Excellence and Innovation in Teaching and Learning. University of New Hampshire.

Advisor Discussion: Assisting Students in Distress (November 2016). Boston University Advising Network's Brown Bag Lunch Series/Workshop.

Meet the Educational Resource Center (October 2014). Boston University Advising Network's Brown Bag Lunch Series/Workshop.

Disability Services & Academic Accommodations (April 2014). Boston University Advising Network's Brown Bag Lunch Series/Workshop.

ADDITIONAL SKILLS AND INTERESTS

Professional expertise in digital publishing tools: Adobe Illustrator, Photoshop, InDesign; Microsoft Office. Experience with Matlab and JMP statistical software.

Proficient in secure web-based classroom tools Blackboard Learn, TopHat, ExamSoft and Piazza. Working knowledge of Learning Analytics and Launchpad platforms.

Vegetable seed starting and gardening, cooking, beekeeping, astronomy and meteorology.