

CURRICULUM VITAE

Daniel J. Shiwarski

BIOGRAPHICAL INFORMATION

Carnegie Mellon University
Department of Biomedical Engineering
Scott Hall 4N300A
Pittsburgh, PA 15213

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EDUCATION

Ph.D. Candidate, Biological Sciences Carnegie Mellon University Center for Neural Basis of Cognition (CNBC)	Pittsburgh, PA	2011-2016
B.S., Cell Biology and Biochemistry Bucknell University	Lewisburg, PA	2005-2009

RESEARCH EXPERIENCE

Postdoctoral Research:	2017-Present
Thesis Advisor: Adam Feinberg, Ph.D., <i>Department of Biomedical Engineering</i> , Carnegie Mellon University	
<ul style="list-style-type: none">Developed a nanomechanical protein-based biosensor to detect strain in living tissuesEngineered cardiac tissue using surface-initiated assembly and 3D bioprinting for regenerative biomedicine applicationsDeveloped computational image analysis software for biomechanical strain tracking and calcium wave propagation.	
Postdoctoral Research:	2016-2017
Thesis Advisor: Manojkumar A. Puthenveedu, Ph.D., <i>Department of Biological Sciences</i> , CNBC, Carnegie Mellon University	
<ul style="list-style-type: none">Identified a COPI interaction motif in the delta opioid receptor regulating its surface traffickingDiscovered a regulatory interaction between TC10 and the delta opioid receptor mediating receptor surface delivery	
Doctoral Research:	2013-2016
Thesis Advisor: Manojkumar A. Puthenveedu, Ph.D., <i>Department of Biological Sciences</i> , CNBC, Carnegie Mellon University	
<ul style="list-style-type: none">Discovered the cellular mechanism underlying the regulation of the delta-opioid receptor (DOR) biosynthetic trafficking to the cell surfaceIdentified and patented a clinical intervention method for increasing functional efficacy of DOR agonists to treat chronic painIdentified agonist dependent regulation of GPCR recycling and exocytic events by kinases, phosphatases, and peptide converting enzymes	
Post-Graduate Research:	2009-2011
Employer: Umamaheswar Duvvuri, M.D., Ph.D., <i>Department of Otolaryngology</i> , University of Pittsburgh, UPMC	
<ul style="list-style-type: none">Identified a biologically relevant tumor promoting phenotypic and molecular signaling pathway associated with the calcium-activated chloride ion channel TMEM16A in various cancer modelsDeveloped TMEM16A expression as a biomarker for poor prognosis and outcomes in head and neck cancer patientsElucidated an epigenetic molecular switch between tumor growth and metastasis controlled by TMEM16A expression	
Summer Research:	2008
Advisors: Jennifer Rubbin Grandis, M.D., <i>Department of Otolaryngology and Pharmacology</i> , Director of Head and Neck Cancer Program at UPMC Hillman Cancer Center, and Ann Marie Egloff, Ph.D., <i>Department of Otolaryngology</i> , University of Pittsburgh	

- Designed and conducted experiments to evaluate the combined effectiveness of Dasatinib and Erlotinib on the SRC and EGRF cell signaling receptors in head and neck cancer cell lines.
- Developed a data analysis application using Matlab software to identify protein and phosphoprotein markers of interest in head and neck cancer cell line treatments, as well as identifying proteins that are responsible for categorizing therapeutic treatments sensitivity for various cell lines

Undergraduate Research:**2007-2009**Advisor: Justin Clay Harris, Ph.D., *Department of Biochemistry*, Bucknell University

- Identified human molecular precursors in the field of aortic aneurism using IR spectroscopy
- Developed and optimized several computational analysis programs in Matlab software including: Principle Component Analysis, Quantile-Quantile Analysis, and Spatial Image Reconstruction programs

PEER REVIEWED PUBLICATIONS

I have published 18 peer-reviewed research articles (677 citations, h-index is 11)

Published:

1. Boyd-Shiwarski CR, Weaver C, Beacham R, **Shiwarski DJ**, Connolly K, Nkashama L, Mutchler S, Griffiths S, Knoell S, Marciszyn A, Subramanya AR. Effects of extreme potassium stress on blood pressure and renal tubular sodium transport. *AJP Renal* (2020) PMID: 32281415
2. Cheng YW, **Shiwarski DJ**, Ball RL, Whitehead KA, Feinberg AW. Engineering Aligned Skeletal Muscle Tissue Using Decellularized Plant-Derived Scaffolds. *ACS Biomaterials Science & Engineering* (2020)
3. **Shiwarski DJ**, Tashman J, Eaton A, Apodaca G, Feinberg AW. 3D Printed Biaxial Stretcher Compatible with Live Fluorescence Microscopy. *HardwareX* (2020)
4. Lee A, Hudson AR, **Shiwarski DJ**, Tashman J, Hinton TJ, Yerneni S, Bliley J, Campbell PG, Feinberg AW. 3D Printing of Collagen to Rebuild Components of the Human Heart. *Science* (2019). PMID: 31371612
5. Kalmykov A, Huang C, Bliley J, **Shiwarski D**, Tashman J, Abdullah A, Rastogi SK, Shukla S, Mataev E, Feinberg AW, Hsia KJ, Cohen-Karni T. Organ-on-a-chip: Three-dimensional self-rolled biosensor array for electrical interrogations of human electrogenic spheroids. *Science Advances* (2019) PMID: 31467978
6. **Shiwarski DJ**, Crilly SE, Dates A, Puthenveedu MA. Dual RXR motifs regulate NGF-mediated intracellular retention of the delta opioid receptor. *Mol Biol Cell*. 2019 Jan 2; mbcE18050292. doi: 10.1091/mbc.E18-05-0292. PubMed PMID: 30601694.
7. Rastogi SK, Bliley J, **Shiwarski DJ**, Raghavan G, Feinberg AW, et al. Graphene Microelectrode Arrays for Electrical and Optical Measurements of Human Stem Cell-Derived Cardiomyocytes. *Cellular and molecular bioengineering*. 2018 May 04; 11(5):4070418.
8. Boyd-Shiwarski CR, **Shiwarski DJ**, Roy A, Namboodiri HN, Nkashama LJ, Xie J, McClain KL, Marciszyn A, Kleyman TR, Tan RJ, Stolz DB, Puthenveedu MA, Huang CL, Subramanya AR. Potassium-regulated distal tubule WNK bodies are kidney-specific WNK1 dependent. *Mol Biol Cell*. 2018 Feb 15; 29(4):499-509. doi: 10.1091/mbc.E17-08-0529. Epub 2017 Dec 13. PubMed PMID: 29237822; PubMed Central PMCID: PMC6014176.
9. Godse NR, Khan N, Yochum ZA, Gomez-Casal R, Kemp C, **Shiwarski DJ**, Seethala RS, Kulich S, Seshadri M, Burns TF, Duvvuri U. TMEM16A/ANO1 Inhibits Apoptosis Via Downregulation of Bim Expression. *Clin Cancer Res*. 2017 Dec 1; 23(23):7324-7332. doi: 10.1158/1078-0432.CCR-17-1561. Epub 2017 Sep 12. PubMed PMID: 28899969; PubMed Central PMCID: PMC5898434.
10. **Shiwarski DJ**, Darr M, Telmer CA, Bruchez MP, Puthenveedu MA. PI3K Class II α regulates δ -Opioid Receptor Export from the trans-Golgi Network. Mostov KE, editor. *Mol. Biol. Cell*. 2017 May 31; mbc.E17-01-0030. PMID: 28566554
11. **Shiwarski DJ**, Tipton A, Giraldo MD, Schmidt BF, Gold MS, Pradhan AA, Puthenveedu MA. A PTEN-Regulated Checkpoint Controls Surface Delivery of δ Opioid Receptors. *J. Neurosci*. 2017 Apr 5; 37(14):3741-52. PMID: 28264976

12. Weinberg ZY, Zajac AS, Phan T, **Shiwarski DJ**, Puthenveedu MA. Sequence-Specific Regulation of Endocytic Lifetimes Modulates Arrestin-Mediated Signaling at the μ Opioid Receptor. **Molecular Pharmacology**. 2017 Apr;91(4):416–27. PMID: 28153854
13. Bowman SL, **Shiwarski DJ**, Puthenveedu MA. Distinct G protein-coupled receptor recycling pathways allow spatial control of downstream G protein signaling. **J. Cell Biol**. 2016 Sep 26;214(7):797–806. PMCID: PMC5037407
14. Bowman SL, Soohoo AL, **Shiwarski DJ**, Schulz S, Pradhan AA, Puthenveedu MA. **Cell Rep**. 2015 Mar 17. pii: S2211-1247(15)00203-X. doi: 10.1016/j.celrep.2015.02.045. PMID: 25801029
15. Van PT, Bass V, **Shiwarski D**, Lanni F, Minden J. High dynamic range proteome imaging with the structured illumination gel imager. **ELECTROPHORESIS**. 2014 Sep;35(18):2642–55. PMID: 24935033
16. **Shiwarski DJ**, Shao C, Bill A, Kim J, Xiao D, Bertrand CA, Seethala RS, Sano D, Myers JN, Ha P, Grandis J, Gaither LA, Puthenveedu MA, Duvvuri U. To "Grow" or "Go": TMEM16A Expression as a Switch between Tumor Growth and Metastasis in SCCHN. **Clin. Cancer Res**. 2014 Sep 1;20(17):4673–88. PMCID: PMC4160843
17. Duvvuri U, **Shiwarski DJ**, Xiao D, Bertrand C, Huang X, Edinger RS, Rock J, Harfe BD, Henson BJ, Kunzelmann K, Schreiber R, Seethala RR, Egloff AM, Chen X, Lui VW, Grandis JR, Gollin SM. TMEM16A, induces MAPK and contributes directly to tumorigenesis and cancer progression. **Cancer Res**. 2012 May 7. PMID: 22564524
18. Chênevert J, Duvvuri U, Chiosea S, Dacic S, Cieply K, Kim J, **Shiwarski D**, Seethala RR. DOG1: a novel marker of salivary acinar and intercalated duct differentiation. **Mod Pathol**. 2012 Mar 30. doi: 10.1038/modpathol.2012.57. PMID: 22460810

<https://www.ncbi.nlm.nih.gov/sites/myncbi/1n7-ni1iPmmkz/bibliography/43361804/public/?sort=date&direction=descending>
<https://scholar.google.com/citations?user=ydXzrswAAAAJ&hl=en&oi=ao>

Preprints and In Review:

1. Bliley JM, Vermeer M, Duffy R, Batalov I, Kramer D, Tashman JW, **Shiwarski DJ**, Lee A, Teplenin AS, Volkens L, Coffin B, Hoes MF, Kalmykov A, Palchesko RN, Sun Y, Jongbloed JDH, Bomer N, de Boer RA, Suurmeijer AJH, Pijnappels DA, Bolling MC, van der Meer P, Feinberg AW. Dynamic Loading of Human Engineered Heart Tissue Enhances Contractile Function and Drives Desmosome-linked Disease Phenotype. Preprint *bioRxiv* (2020)
2. **Shiwarski DJ**, Tashman J, Tsamis A, Bliley JM, Blundon M, Aranda-Michel E, Szymanski J, McCartney B, Davidson L, Feinberg AW. Fibronectin-Based Nanomechanical Biosensors to Map 3D Mechanical Strain in Live Cells and Tissues. Preprint *bioRxiv* (2019) doi: <https://doi.org/10.1101/2020.02.11.943696>, 2nd Review *Nature Communications* (2020)

Grants and Funding Sources

NIH – NHLBI NRSA F32 Postdoctoral Fellowship

04/01/2018 – 04/01/2020

- 1F32HL142229-01
 - National Heart, Lung, And Blood Institute of the National Institutes of Health under Award Number F32HL142229
 - Mapping 3D Mechanical Strains During Embryonic Heart Formation to Improve the Structure and Function of Engineered Human Heart Muscle

AHA Postdoctoral Fellowship

07/01/2018 – 06/30/2020

- 18POST33990298 (Declined for NIH F32)
 - Summer 2018 Postdoctoral Fellowship
 - Mapping 3D Mechanical Strains During Embryonic Heart Formation to Improve Engineered Human Heart Muscle

HONORS, AWARDS, AND INVITED PRESENTATIONS

Invited Speaker, BMES Biomedical Engineering Conference, Philadelphia, PA

Oct 2019

- “3D Bioprinting of Mammary Duct Models to Study DCIS”

Invited Speaker, SB3C Biomechanics and Bioengineering Conference, Seven Springs, PA	Jun 2019
• “3D Bioprinting of Mammary Duct Models to Study DCIS”	
Invited Speaker, Society for Biomaterials Conference, Seattle, WA	Apr 2019
• “3D Bioprinting of Mammary Duct Models to Study DCIS”	
Software Developer, Imaris (Bitplane, Oxford Imaging)	Jun 2018
• Free software and full access for creating plugins for Imaris 3D Image Analysis Software	
Awarded an NIH F32 Postdoctoral Fellowship	Apr 2018
• “Mapping 3D Mechanical Strains During Embryonic Heart Formation”	
Awarded an AHA Postdoctoral Fellowship (Declined)	Apr 2018
• “Mapping 3D Mechanical Strains During Embryonic Heart Formation”	
Winner, 1st Place Poster at Society for Biomaterials Conference, Atlanta, GA.	Apr 2018
• “Mapping 3D Mechanical Strain during Tissue Formation with a Nanomechanical Biosensor”	
Invited Speaker, SB3C Biomechanics and Bioengineering Conference, Tucson, AZ	Jun 2017
• “Rebuilding the Heart by 3D Bioprinting of the Extracellular Matrix”	
Elected Chair, Gordon Research Seminar on Molecular Pharmacology	Apr 2017
• Located in Tuscany, Italy	
Winner, 3 Minute Thesis Competition Prelim, CMU.	Mar 2016
• “Unlocking the DOR to the Surface for Treatment of Chronic Pain”	
Panelist, Discussion with Dr. Harvey Fineberg, CMU.	Feb 2016
• Participant in round table discussion on Science and Medicine Policy	
Awardee, De Vries Fellowship Outstanding Promise in Biological Research, CMU	2015 - 16
• One year full scholarship from the Department of Biological Science	
Invited Speaker, Gordon Research Seminar on Molecular Pharmacology, CA, USA.	Feb 2015
• “A Golgi Export Checkpoint Limits the Efficacy of Delta Opioid Receptor Agonists”	
Winner, 1st Place Poster and Talk Award at Great Lakes GPCR Conference, QC, Canada.	Oct 2014
• “Unlocking the DOR to the Surface: Regulated Trafficking of the Delta Opioid Receptor”	
Awardee, Graduate Student Assembly Research Travel Award, CMU	Oct 2014
• Great Lakes GPCR Conference	
Invited Speaker, Annual Local Traffic Meeting, PA, USA.	May 2014
• “Unlocking the DOR to the Surface”	
Winner, Distinguished Poster Award at Great Lakes GPCR Retreat, OH, USA	Oct 2013
• “NGF induces intracellular retention of the δ -Opioid receptor through inhibition of PI3K”	
Winner, Distinguished Poster Award for Center for Neural Basis of Cognition, PA, USA	Nov 2012
• “Heterologous Regulation of mu opioid receptor recycling by the neurokinin-1 receptor”	
Awardee, Graduate Student Assembly Research Travel Award, CMU	Oct 2012
• Society for Neuroscience Conference	
Invited Speaker, Univ. Pitt. Cancer Inst. Basic & Translational Research Seminar Series	Sep 2010
• “Effects of TMEM16A expression on motility and metastasis of epithelial tumor cell lines”	
Winner, Director’s Award for Scientific Excellence, Univ. of Pittsburgh Cancer Institute	Jun 2010
• Distinguished Poster Award for Clinical/Translational Cancer Research	

PRESENTATION and MEETING ABSTRACTS

1. Biomedical Engineering Symposia	Atlanta, GA	Oct 2018
Cheng YW, Shiwarski DJ, Ball RL, Whitehead KA, Feinberg AW		
Engineering Highly Aligned Human Muscle using Plant-derived Cellulose Scaffolds		
2. Local Traffic	Pittsburgh, PA	May 2018
Shiwarski DJ, Tsamis A, Jallerat Q, Tashman J, Blundon M, Szymanski JM, McCartney B, Feinberg AW		
Mapping 3D Mechanical Strains during Tissue Formation with a Fibronectin-based Nanomechanical Biosensor		
3. Society for Biomaterials	Atlanta, GA	Apr 2018
Shiwarski DJ, Tsamis A, Jallerat Q, Tashman J, Blundon M, Szymanski JM, McCartney B, Feinberg AW		
Mapping 3D Mechanical Strains during Tissue Formation with a Fibronectin-based Nanomechanical Biosensor		
4. Cell and Molecular Bioengineering Conference	Key Largo, FL	Jan 2018
Shiwarski DJ, Tsamis A, Jallerat Q, Tashman J, Blundon M, Szymanski JM, McCartney B, Feinberg AW		
Mapping 3D Mechanical Strains during Tissue Formation with a Fibronectin-based Nanomechanical Biosensor		
5. Great Lakes GPCR Retreat	Toronto, CAN	Oct 2015
Shiwarski DJ, Tipton A, Pradhan A, Puthenveedu MA.		

- A Phosphoinositide-Regulated Golgi Checkpoint Regulates the Bioavailability of Delta Opioid Receptors.
6. **Overcoming Barriers in Pain Research** **Pittsburgh, PA** **Jun 2015**
Shiwarski DJ, Tipton A, Pradhan A, Puthenveedu MA.
Engineering Surface Delivery of Delta Opioid Receptors to Target Pain.
 7. **Annual Local Traffic Meeting** **Pittsburgh, PA** **May 2015**
Shiwarski DJ, Tipton A, Pradhan A, Puthenveedu MA.
A Golgi Export Checkpoint Limits the Efficacy of Delta Opioid Receptor Agonists in Neurons.
 8. **Gordon Research Seminar: Mol. Pharmacology** **Ventura Beach, CA** **Feb 2015**
Shiwarski DJ, Tipton A, Pradhan A, Puthenveedu MA.
A Golgi Export Checkpoint Limits the Efficacy of Delta Opioid Receptor Agonists in Neurons.
 9. **Great Lakes GPCR Retreat** **Montreal, CAN** **Oct 2014**
Shiwarski DJ, Tipton A, Pradhan A, Puthenveedu MA.
Unlocking the DOR to the Surface: Regulated Trafficking of the Delta Opioid Receptor.
 10. **Annual Local Traffic Meeting** **Pittsburgh, PA** **May 2014**
Shiwarski DJ, Puthenveedu MA.
Unlocking the DOR to the Surface.
 11. **American Society for Cell Biology** **New Orleans, LA** **Dec 2013**
Shiwarski DJ, Puthenveedu MA.
NGF induces intracellular retention of the δ -Opioid by decreasing Phosphoinositide(3, 4)P.
 12. **Great Lakes GPCR Retreat** **Cleveland, OH** **Oct 2013**
Shiwarski DJ, Puthenveedu MA.
NGF induces intracellular retention of the δ -Opioid receptor through inhibition of PI3K.
 13. **Annual Local Traffic Meeting** **Pittsburgh, PA** **May 2013**
Bowman SL, Soohoo AL, Shiwarski DJ, Puthenveedu MA. Heterologous Regulation of mu-Opioid Receptor Recycling by the Neurokinin-1 Receptor
 14. **Society for Neuroscience** **New Orleans, LA** **Oct 2012**
Bowman SL, Soohoo AL, Shiwarski DJ, Puthenveedu MA. Heterologous Regulation of mu-Opioid Receptor Recycling by the Neurokinin-1 Receptor
 15. **American Association for Cancer Research** **Orlando, FL** **Apr 2011**
Shiwarski DJ, Kim J, Bertrand C, Seethala RS, Grandis JR, Duvvuri U. TMEM16A Promotes an Epithelial Phenotype *In Vitro* and Demonstrates Pleotropic Expression through DNA Methylation in Oncogenic Progression from Primary Tumor to Nodal Metastasis in HNSCC Patients.
 16. **University of Pittsburgh Biology Retreat** **Pymatuning, PA** **Oct 2010**
Shiwarski DJ, Kim J, Bertrand C, Seethala RS, Hu LM, Grandis JR, Duvvuri U. TMEM16A Promotes an Epithelial Phenotype in Cell lines and Promotes Decreased Motility in *in vitro* Cancer Models.
 17. **University of Pittsburgh Cancer Institute Retreat** **Pittsburgh, PA** **Jun 2010**
Shiwarski DJ, Bertrand C, Huang X, Grandis JR, Gollin SM, Duvvuri U. TMEM16A, a Novel Calcium-Activated Chloride Channel, Modulates Tumor Proliferation via MAPK and Cyclin-D1 Signaling.
 18. **Experimental Biology Conference** **Anaheim, CA** **Apr 2010**
Shiwarski DJ, Seethala RS, Gollin SM, Grandis JR, Duvvuri U.
Effects of TMEM16A Expression on Motility and Metastasis in Epithelial Tumor Cell Lines

RELEVANT RESEARCH TECHNIQUES

- Cell Culture
- Western Blotting
- Immunofluorescence
- Live cell fluorescence imaging
- DNA/RNA Transfections
- PCR Analysis
- DNA electrophoresis
- Seahorse Metabolic Assays
- *In vivo* Animal Handling
- DNA/RNA Sequencing
- Histology
- Electron Microscopy
- Confocal / TIRF Microscopy
- *In vitro* Cell pH Measurements
- Data Analysis Programming
- Image-J Programming
- Primary neuronal/cardio cell isolations
- Frozen Section
- Dissection Experience
- Autopsy experience
- AutoCAD
- 3D Printing

CONTRIBUTIONS TO EDUCATION

Mentoring Experience:

- **Mentoring as a Postdoctoral Fellow, CMU**
 - Eman Mirdamadi (Masters Candidate) 2018-
 - o Development of 3D printed tissue phantoms for surgical planning
 - Sanjana Shah (Undergraduate) 2018-
 - o Evaluation of biomechanical strain during muscle cell elongation and fusion
 - Brittany Egnot (M.D. Ph.D. Candidate) 2018-2019
 - o Development of improved nanomechanical biosensor fabrication methods
 - Joshua Tashman (M.D. Ph.D. Candidate) 2018-
 - o Studied 3D bioprinting of Collagen Trachea and Mammary Ducts
 - Jacqueline Bliley (Ph.D. Candidate) 2017-
 - o Evaluation of dynamic strain loading on engineered cardiac tissue function
 - Andrew Hudson (Ph.D. Candidate) 2017-
 - o Studied 3D bioprinting of Collagen Heart Valves
 - Andrew Lee (Ph.D. Candidate) 2017-
 - o Studied 3D bioprinting and calcium imaging of cardiac tissue
 - TJ Hinton (Ph.D. Candidate) 2017-2018
 - o Studied 3D bioprinting of Collagen and various biomaterials
- **Mentoring as a Graduate Student, CMU**
 - Stephanie Crilly (Ph.D. Candidate) 2016-2018
 - o Studied the biosynthetic trafficking of GPCRs
 - Cloning, Cell Culture, Fluorescence Microscopy, Data Analysis
 - Surya Agarwal, Mengshen Chen, and Emily Simon (Ph.D. Candidates) 2014-2015
 - o Studied the mechanisms regulating DOR exocytic trafficking
 - Cloning, Cell Culture, Fluorescence Microscopy, Data Analysis
 - Daniel Ackerman (Ph.D. Candidate) 2015
 - o Studied the role of interactions between endosomes and the endoplasmic reticulum
 - Cloning, Cell Culture, Live Cell Imaging
 - Andrew dates, Marlena Darr, and Joseph Defazio (Undergraduates) 2014-2017
 - o Studying the regulation and biochemical interactions between DOR, Rabs, and TC10
 - Cloning, Cell Culture, Fluorescence Microscopy, Western Blotting, Data Analysis
- **Mentoring as Research Specialist at Univ. Pitt**
 - Jean Kim (Undergraduate) 2010-2011
 - o Studied switch between tumor growth and metastasis controlled by TMEM16A
 - qRT-PCR, Migration Assays, Cell Culture, DNA/RNA Isolation
 - Dr. Jason Kass, M.D. (Surgical Fellow) 2010-2011
 - o Studied the chloride channel conductance and expression of TMEM16A
 - qRT-PCR, DNA/RNA Isolation, Western Blotting
 - Lu Mei Hu (Medical Student) 2010
 - o Studied tumor metastasis controlled by altered TMEM16A expression
 - Migration Assays, Cell Culture, Metabolic Assays

Teaching Experience: CMU and University of Pittsburgh

- **Introduction to Microscopy for Univ. Pitt Bioengineering Students (72 Students)** 2019 - Present
 - Designed, developed, and taught a 3 lecture course for introduction to microscopy
- **Grant Writing Course for PhD and Master Students at CMU (15 Students)** 2018
 - Designed, developed, a 8 week course for writing NIH training grants
- **3D Bioprinting Workshop (30 Researchers) at CMU** 2018 - Present
 - Designed, developed, and taught a course for building 3D bioprinters using FRESH Method
- **GEM4 Laboratory Coordinator: Neuronal Cell Culture (60 Students)** 2015
 - Designed, developed, and taught a course for neuronal cell culture for 60 students
 - The course covered neuronal isolation, culture, differentiation, and immunofluorescence
 - <http://www.ices.cmu.edu/gem4/>
- **Teaching Assistant: Cell Biology (80 Students)** 2015
 - Lectured, held office hours, managed assignments and graders
- **Guest Lecturer (150 Students)** 2014

- Modern Biology
- General Course Material and Review sessions
- **Teaching Assistant: Modern Biology (150 Students)** 2014
 - Lectured, held office hours, managed assignments and graders
- **Guest Lecturer (60 Students)** 2013
 - Human Physiology
 - Taught Renal Physiology
- **Teaching Assistant: Human Physiology (60 Students)** 2013
 - Lectured, held office hours, managed assignments and graders

SERVICE AND COMMITTEE WORK

- **Selected as eLife Ambassador for Early Career Advisory Group** 2018-2019
 - Selected as a member of the eLife Ambassador program for promoting early career scientists
 - Focused on reproducibility in science, peer review, and preprint publishing
- **Environmental Health and Safety (EHS) Committee, CMU** 2013-2016
 - EHS Representative for the student population at CMU
 - Spokesperson for student concerns and opinions to influence EHS policy reform
- **Environmental Health and Safety Student Committee Chair, CMU** 2013-2016
 - EHS student committee chair for the student population at CMU
 - Elected Chair, Coordinate and plan student committee meetings and manage meeting agenda
- **The Sciences Teaching Club High School Outreach Volunteer, CMU** 2013-2015
 - Teaching assistant for Teaching Club outreach lab
 - Taught local high school students DNA isolation and PCR techniques
- **Department of Biological Sciences High School Outreach Volunteer, CMU** 2011-2016
 - Advised by Dr. Carrie Doonan, funded by Gelfand Foundation
 - Teaching assistant for biology outreach labs
 - Designed and participated in outreach activities
- **UPMC Pathology Fellowship Program, Univ. Pitt.** 2007
 - Advisors: Larry Nichols, M.D., and Bernard Klionsky, M.D.
 - Participated and assisted in daily autopsies and gross diagnostic procedures
- **Winter Externship in Anesthesiology, UPMC** 2007
 - Advisors: Charles Buffington, M.D.
 - Observed open-heart surgery, removal of an aneurism, kidney transplant, repair of non-disjunction in leg, spinal disc reconstruction, a tracheotomy, and skin grafts.
- **Hospital Volunteer** 2006-2009
 - Evangelical Hospital, Lewisburg PA
 - Assisted in patient care and rehabilitation for 2 hours/week
- **Physical Therapy Volunteer** 2004-2006
 - Health South Physical Therapy, Washington, PA
 - Assisted in patient care and rehabilitation for 4 hours/week

PROFESSIONAL DEVELOPMENT

- **Eberly Center Future Faculty Documentation of Teaching Program, CMU** 2012-2015
 - Received feedback on guest lectures from a teaching consultant
 - Attended micro-teaching workshops and seminars
- **Grant Proposal Writing Workshop, CMU** 2013
 - Peer reviewed proposals and submitted proposals for peer feedback
- **Speaking Skills for Scientific Talks Workshop, CMU** 2012
 - Workshop on giving effective scientific talks, gave and received peer feedback

ASSOCIATION MEMBERSHIPS

1. Biomedical Engineering Society	2018	
2. Society for Biomaterials	2018	
3. American Heart Association	2017	
4. American Society for Cell Biology	2013	Student Member: ID# 91859
5. Society for Neuroscience	2012	
6. American Association for Cancer Research	2011	Associate Member: ID# 257014

SOFTWARE MACROS / CODE

Image J:

1. **Daniel J. Shiwarski.** Rab Localization and Golgi Profiling. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, 2014.
2. **Daniel J. Shiwarski.** Golgi Localization and Cellular Distribution of GPCR. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, 2013.
3. **Daniel J. Shiwarski.** Background Subtraction Loop. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, 2013.
4. **Daniel J. Shiwarski.** EPAC and EKAR Fluorescent Ratiometric Analysis. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, 2013.
5. **Daniel J. Shiwarski,** Ruben K. Dagda, Charleen T. Chu. Green and Red Puncta Colocalization. Pathology Department, University of Pittsburgh. 2010. Online.
http://imagejdocu.tudor.lu/doku.php?id=plugin:analysis:colocalization_analysis_macro_for_red_and_green_puncta:start#author

MatLab:

6. **Daniel J Shiwarski,** and Josh Tashman. Biomechanical Strain Analysis. 2018
7. **Daniel J Shiwarski,** and Josh Tashman. 3D electrical propagation maps of neuronal tissue. 2018
8. **Daniel J Shiwarski,** and Josh Tashman. Quantitative Calcium Imaging Analysis. 2018
9. **Daniel J Shiwarski.** Red/Green Heatmap for Proteomics Comparative Analysis. Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA, 2013.
10. **Daniel J. Shiwarski.** RPPA Data Analysis PCA Clustering and MM Outlier Identifier. Department of Otolaryngology, University of Pittsburgh, 2008.

ACADEMIC REFERENCES

- **Manojkumar A. Puthenveedu,** Associate Professor (thesis adviser)
Dept. of Biological Sciences
Carnegie Mellon University
202 Mellon Institute
Pittsburgh, PA 15213
map3@andrew.cmu.edu
(412) 268-8236
- **Adam D. Linstedt,** Professor (thesis committee member)
Dept. of Biological Sciences
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(412) 268-1249
- **Nathaniel N. Urban,** Professor (thesis committee member)
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(412) 648-9590