

Notes from the North

Reporting at a Molecular Level

by Spencer Scott POST-BAC, USM/MMCRI

Tom McCarthy's brilliant film *Spotlight* took best picture at the Oscars this year. In an age when news has become synonymous with 24-hour cable networks plastered with pundits and steadily declining newspaper readerships, *Spotlight* is an important homage to the important role of real journalism in American society. For over seven years I worked as an aspiring producer for outlets including NPR, CNN, and ABC. While I would never dream of comparing my young career to the work of the incredible reporters at the Globe's investigative unit, there is still a common aspiration amongst all those who enter the field. As their name, "Spotlight," implies, we wish to shine light where there once was darkness, to illuminate the unknown for the betterment of our society.

A little more than a year ago, I left the craft to which I had thought I would devote my life. I spent the final four months of my career in television news shooting a medical documentary series for ABC in three of Boston's Level I trauma centers. It was there in those halls that I finally decided to follow in the foot steps of my mother, father, and brother, and pursue medicine. I left my work in television and returned to my home state to begin a post-baccalaureate pre-medical program at University of Southern Maine, which I will finish in May. It may seem odd that the child of an orthopedic surgeon and emergency room physician grew up shying, if not flat out running, away from the sciences. I still struggle to answer that for myself. But the only answer I can give is that I didn't think my mind was wired in that way. I loved history and language and stories, and when I thought I could help people by telling their stories, I believed I'd found my calling. I sold my first story to NPR when I was seventeen, an interview with an Iraq war veteran, only three years older than I was. He had nearly lost his life in an IED explosion in Fallujah, the shrapnel of which had torn through his throat, rendering his voice a quiet rasp. Because of my reporting, millions of "All Things Considered" listeners



CNN cameraman Spencer Scott reporting on the blackout in Manhattan following Hurricane Sandy in 2012.

heard Cpl. Chris Kotch tell his story. It was a feeling that inspired the pursuits of the next decade of my life.

In fact, after all of my years working in the field, I'm still proudest of the reporting I did when I was just a kid in high school. None of the stories I told in my professional career carried the weight that my earliest, self-directed work did. Working for big networks, the feeling that you had helped someone share something vital, that you had illuminated what was once shrouded in darkness, became rare, especially for a young producer. But in Boston, as I watched the doctors in my camera's viewfinder treating their patients I saw something so exhilarating. It may sound cliché, or like a line from "We Are the World," but I saw people helping people, through my lens and live before my eyes. I do not mean to discount the importance of journalism, I believe steadfastly in the critical role it plays in our society. But for me, witnessing those human connections made walking away from the field easy. I knew my place lay on the other side of the lens where the help was deliv-

ered every day directly and in real time. Back in Maine, I threw myself headlong into my studies. When I walked into my first class at USM (BIO 105 Cell & Molecular Biology) I didn't yet know if I had a mind for science, but I was willing to do whatever it took. Fortunately, I soon learned that in academia, you can do whatever you set your mind to, as long as you are willing to put in the work and the passion is genuine. Finding science has been the most fulfilling and gratifying experience of my life and I have been rewarded for the work I've put into it. When I started my program a little over a year ago, I never could have dreamed that I would be interning at a place like Maine Medical Center Research Institute, involved in the incredible work its investigators perform every day. In one sense, my work at the Institute is the farthest I have yet strayed from the newsroom. Whether it is furiously scribbling down names of promoters or genes or antibodies to google, or looking at slides of fluoresced cells and western blots, every Monday lab meeting reminds me that I am not in Kansas anymore. But in another sense, the work of the researchers at MMCRI is akin to that original creed of the aspirant journalist. Science and research, like journalism, work to shed light where there once was darkness. Both disciplines endeavor to peer into the unknown and learn what lies within. Whether it be learning the struggle of an American veteran who can no longer sleep through the night, or learning the process by which the notch signaling pathway impacts the function of endothelial cells in vasculature, science and journalism share the understanding that we are all better off for knowing.

Spencer Scott is a current member of the Liaw Lab at MMCRI and recent transplant to the field of molecular medicine. He worked in New York as a producer for NPR, CNN, and ABC for seven years, and is now a pre-med post-baccalaureate studying Biochemistry at the University of Southern Maine. Spencer will be applying to M.D. programs this spring.

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GSC**InSight Team**

Information on page 11

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Newsletter

- Interested in joining the Newsletter committee next year? All Sackler community members are invited. E-mail us at insight@elist.tufts.edu. Subject: "Joining the committee" to be added to the list. We're looking for writers, editors, photographers, people interested in helping to manage the blog, and people interested in page layout using Adobe InDesign. No experience necessary, just keen interest and creativity.
- No experience using InDesign, but interested in learning? Want to take over making the Insight PDFs next year? Let us know by e-mail: insight@elist.tufts.edu. Subject: "InDesign". Dan Wong will be offering a crash course, details TBA.
- Check out our new blog: <http://sites.tufts.edu/insight>

Social

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Interested in writing?

We'd like your contribution! Works about both science and non-science topics accepted. Writers will be acknowledged, with increasing recognition (guest writer, contributor, staff writer) for additional content submissions and publication. E-mail us: insight@elist.tufts.edu

Sackler student groups updates, March

A monthly update from GSC-funded clubs about their activities.

Upcoming Events:

- **TMCP Circle Meetings**
Mar — *Various locations*
- **TBBC Case Study Group**
M, weekly — 5-7PM, *Jaharis 508*
Julie Hewitt Coleman guides students and postdocs through the case interview process. Practice solving cases, gain insight and tips, and learn more about the field of consulting.
- **TBBC Biotech Journal Club**
F Mar 25 — 12PM Noon, *Jaharis 254*
BJC will meet to discuss current topics in the biotech industry. To join the mailing list, email tuftsbiotech@gmail.com with the subject line: BJC.
- **TBBC Venture Capital Panel**
Th May 19 — 5-7 PM, *Location TBD*
Dr. Greg Sieczkiewicz, JD, PhD, a Sackler alum, now Managing Director and Chief IP Counsel at MPM Capital, will be bringing a number of his colleagues to Sackler for a panel discussion focused on venture capital.

Recent Events:

- **TBBC Dave Greenwald, PhD**
Tu Feb 9 — Dr. Dave Greenwald, a 2010 Sackler alum, now Director of Business Development and Corporate Sponsorships at Johns Hopkins Technology Ventures, gave a career seminar titled, “Starting a Company: Practical Advice for a Precarious Pursuit.”
- **TBBC Lauren Linton, PhD**
Th Feb 25 — 5Dr. Lauren Linton, Deputy Director of the Tufts Institute for Innovation, formerly co-Director of the Sequencing Center at the Whitehead Institute and Associate Director of the Center for Genome Research at the Whitehead/MIT, gave a career seminar titled, “Don’t Be Afraid to Experiment.”
- **TBBC Biotech Journal Club**
F Feb 26 — Farrah Roy^{GENE} gave a presentation on Google’s efforts in the biotechnology and healthcare industries.

- **TBBC Biotech Journal Club**
Tu Mar 1 — Representatives from ClearView Healthcare Partners, including recent Sackler alum. Andy Coppage^{BCHM}, spoke to students about consulting and ClearView’s Connect to ClearView program for advanced degree candidates.

Tufts Biomedical Business Club

(TBBC) from Jaclyn Dunphy^{NRSC}
The Tufts Biomedical Business Club (TBBC) is a student run organization whose mission is to cultivate business leaders in the health and life sciences. TBBC is a growing community of graduate, medical, dental and nutrition students, postdocs, physicians, scientists and alumni. It provides members with opportunities to learn about consulting, business development, entrepreneurship, intellectual property and more. We engage our members through a number of initiatives including a seminar series, Biotech Journal Club, Consulting Case Study Group, panel discussions, and most recently Biotech BUZZ. E-mail tuftsbiotech@gmail.com for more information.

Tufts University Biomedical Queer Alliance (TBQA)

from Laura Darnieder^{NRSC}
Tufts University Biomedical Queer Alliance (TBQA) is a graduate school-based, student-led club organized to create a supportive environment for non-heterosexual and non-cisgendered (NH&NC) individuals between the different professional health and degree programs within the downtown Tufts University campus. In addition, we aim to increase engagement and awareness of the student body in LGBTQ issues that affect both their fellow students as well as the communities they serve. Our organization fosters collaboration and mentorship between physicians, researchers, and students, and aims to strengthen the commitment of Tufts Medical Center and Tufts University Health Sciences campus in supporting NH&NC health, research, and career development. We aim to do this through a variety of activities, including panel discussions, creating mentoring opportunities, orientation events, curriculum feedback, and social events. E-mail TUFTSBQA@

elist.tufts.edu for more information.

Tufts Mentoring Circles Program (TMCP)

from Siobhan McRee^{GENE}
and Carrie Hui^{CMDB}

The Tufts Mentoring Circles Program (TMCP) is a student run organization whose mission is create a confidential space that enables meaningful and helpful discussion of career development and/or work-life balance topics to facilitate personal growth and aid in goal exploration. Through the formation of small group mentoring circles, we aim to connect individuals who will become each other’s advocates and accountability partners. These mentoring circles will be a general resource for providing insight, fostering cross-program and cross-departmental collaboration, supporting graduate student life and well-being, and promoting opportunities for networking within the greater Tufts community. If you would like to get involved, including helping organize circles, reach out to alumni, or plan events, e-mail tuftsmentoring@gmail.com for more information.

GSC Career Paths Committee (GSC)

Duties include: organize the Career Paths Seminar series; recruit external speakers from a diverse set of professional environments to speak about their career experiences; work with the Dean’s office to recruit speakers and to help facilitate events.



sites.tufts.edu/insight



Tufts University Sackler School Students



[sackler_gsc](https://twitter.com/sackler_gsc)

Notes from the Library... Choosing a Citation Manager

by Laura Pavelch^{HHSL}

What is a citation manager?

At their most basic, citation managers are software programs that allow you to store and organize your references, and insert formatted citations and bibliographies into documents.

What citation managers are available?

There are several citation managers available; the library supports EndNote (and EndNote online), Mendeley, RefWorks and Zotero, which are all popular and well-established programs. Other available programs include Papers, Sente and Paperpile.

Which citation manager do you recommend?

It depends! While all citation managers have the same basic features, some citation managers are better for storing and annotating PDFs, working on multiple devices or computers, and collaborating with others. If I had to choose one, then I would recommend EndNote. This robust, widely-used citation manager has a bit of a steeper learning curve but several nice features such as automatically finding full text for references, annotating PDFs on your computer or mobile device, and thousands of citations styles.

How can I get a citation manager?

For this question, I will focus on the four programs that the library supports: EndNote, Mendeley, RefWorks and Zotero. All of these programs works on both Macs and PCs. An EndNote app is available for iPads; a Mendeley app is available for both Android and iOS devices.

EndNote: Available for installation on Tufts-owned or personal computer for anyone with a primary affiliation of student, faculty or staff in the Tufts White Pages. Bring your laptop to the Tufts Technology Services desk on the 5th floor of Sackler (Monday-Thursday 9AM-6 PM, Friday 9AM-7PM) or call 617-627-3376 for remote installation.

Mendeley: Freely available to anyone. Create account and download at: <https://www.mendeley.com/>.

RefWorks: Available to Tufts students, faculty and staff. Create account at: <https://www.refworks.com/refworks2/default.aspx?r=authentication::init&groupcode=RWTuftsU>

Zotero: Freely available to anyone. Create account and download at: <https://www.zotero.org/>

Upcoming Library Events

Full calendar of HHSL events: <http://hirshlibrary.tufts.edu/events>

Open Workshop: Systematic Reviews – Laying the Groundwork

W Mar 9, 4-5 PM | F Mar 11, 9-10 AM

Sackler 510

Thinking about writing a systematic review? Curious about what the process entails? Not sure what a systematic review is? In this workshop, we will explore systematic reviews, meta-analyses, and other types of high-level research reviews. Topics covered include: elements of a systematic review, protocols, resources, timelines, and suggested databases.

Open Workshop: PubMed – The Basics

W Mar 16, 4-5 PM | F Mar 18, 9-10 AM

Sackler 510

In this workshop, we will review the structure of PubMed; planning and executing a search strategy; narrowing the search results; finding full text; and exporting citations.

Open Workshop: EndNote – The Basics

W Mar 23, 4-5 PM | F Mar 25, 9-10 AM

Sackler 510

This session will introduce you to the basics of using the citation management program EndNote. We will cover exporting citations from literature databases (PubMed, Web of Science, etc.) into EndNote, creating references from PDFs, organizing your references, and inserting in-text citations and bibliographies in Word.

Open Workshop: Web of Science & Scopus

W Mar 30, 4-5 PM | F Apr 1, 9-10 AM

Sackler 510

Cross disciplinary subject? Not sure where to go after you have

searched PubMed? Have you written an article and want to know who has cited you? Then Web of Science and Scopus may be for you! In this workshop you will learn how to: construct a keyword search, find citations and references for an article, and create a citation report for an author or set of results.

PubMed Tip of the Month: My NCBI

My NCBI is a personalized account for PubMed and other National Center for Biotechnology Information (NCBI) databases, such as Gene and Protein. This account allows you to save searches and receive daily, weekly or monthly email alerts when new articles meeting your search criteria become available. An NCBI account also allows you to save collections of references; in the My Bibliography section, you can save references to the articles that you have authored. Collections, including My Bibliography, can be made publicly available, providing you with a URL to share with colleagues or use in grant applications. My Bibliography is also used to manage compliance with the NIH public access policy. With an NCBI account, you can also utilize Science Experts Network Curriculum Vitae (SciENCv), a system that helps you create biosketches for NIH and NSF grants.

- To create a NCBI account:
- Click the 'Sign in to NCBI' link in the top-right hand corner of any PubMed page (or, [click here](#)).
- Click 'Register for an NCBI account' link, or sign in with a 3rd party option, such as Google or eRA Commons (recommended for NIH-funded investigators who do not currently have an NCBI account). Note, you cannot use your Tufts username and password as a 3rd party sign in option.

On the Shelf

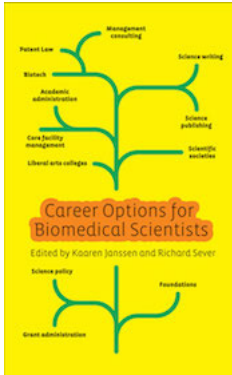
For work...

Career Options for Biomedical Scientists

edited by Kaaren Janssen & Richard Sever

Location: HHSL Book Stacks, Sackler, 5th Floor, W21 J35 2015

This book begins with a brief introduction of why PhDs should consider careers beyond traditional academic positions and then delves into alternatives, including teaching at an undergraduate or liberal arts institution, management consulting or science policy. Each chapter, authored by an individual working in the field, provides a description of the job options, required qualifications, and advice on applying and interviewing for positions in the field.



And leisure...

The Short and Tragic Life of Robert Peace

by Jeff Hobbs

Location: Tisch Tower Café, Tisch Library (Medford) 1st Floor, or request through BLC WorldCat (<http://tufts.worldcat.org/oclc/872653974>)

Recipient of many accolades, this book tells the story of a man from East Orange, New Jersey who studied molecular biophysics and biochemistry at Yale, but never quite managed to move beyond the neighborhood of his youth, and ultimately met an untimely death. Written by his roommate at Yale, this book provides an intimate and thought-provoking portrait of a life.



Sackler Student Publications

February 2016 to present

compiled by Laura Pavlech^{HHSL}

Curtis A, Blackburn JK, Smiley SL, Yen M^{MMB}, Camilli A, Alam MT, Ali A, Morris JG. Mapping to support fine scale epidemiological cholera investigations: A case study of spatial video in Haiti. *Int J Environ Res Public Health*. 2016;13(2); PMID: 26848672.

Garafalo SD^{CMP}, Luth ES^{Post-Doc}, Moss BJ^{NRSC}, Monteiro MI^{CMP}, Malkin E, Juo P. The AP2 clathrin adaptor protein complex regulates the abundance of GLR-1 glutamate receptors in the ventral nerve cord of *Caenorhabditis elegans*. *Mol Biol Cell*. 2015;26(10):1887-900; PMID: 25788288.

Goncalves KA^{CMP}, Hu GF. Mechanism and function of angiogenin in hematopoietic malignancy. 2015;31(12):1267-75; PMID: 26877599.

Graham LC^{GENE}, Harder JM, Soto I, de Vries WN, John SW, Howell GR. Chronic consumption of a western diet induces robust glial activation in aging mice and in a mouse model of Alzheimer's disease. *Sci Rep*. 2016;6:21568; PMID: 26888450.

Hanson E^{NRSC}, Danbolt NC, Dulla CG. Astrocyte membrane properties are altered in a rat model of developmental cortical malformation but single-cell astrocytic glutamate uptake is robust. *Neurobiol Dis*. 2016;89:157-68; PMID: 26875663.

Khaperskyy DA, Schmalig S, Larkins-Ford J^{MMB}, McCormick C, Gaglia MM. Selective degradation of host RNA polymerase II transcripts by influenza A virus PA-X host shutoff protein. *PLoS Pathog*. 2016;12(2):e1005427; PMID: 26849127.

McGuire C^{BCHM}, Cotter K^{CMP}, Stransky L^{CMP}, Forgac M. Regulation of V-ATPase assembly and function of V-ATPases in tumor cell invasiveness. *Biochim Biophys Acta*. 2016; PMID: 26906430.

Otero TM^{CTS}, Canales C, Yeh DD, Johnson EA, Harrison TM, Belcher D, Quraishi SA. Association of serum phosphate levels and anemia in critically ill surgical patients. *JPEN J Parenter Enteral Nutr*. 2016; PMID: 26838527.

Paulus JK, Wessler BS^{CTS}, Lundquist C, Lai LL, Raman G, Lutz JS, Kent DM. Field synopsis of sex in clinical prediction models for cardiovascular disease. *Circ Cardiovasc Qual Outcomes*. 2016;9(1):S8-s15; PMID: 26908865.

Speroni L, Sweeney MF^{GENE}, Sonnenschein C, Soto AM. A hormone-responsive 3D culture model of the human mammary gland epithelium. *J Vis Exp*. 2016(108); PMID: 26891095.

Sweeney MF^{GENE}, Hasan N^{CMDB}, Soto AM, Sonnenschein C. Environmental endocrine disruptors: Effects on the human male reproductive system. *Rev Endocr Metab Disord*. 2016; PMID: 26847433.

Tyc KM, Herwald SE^{MMB}, Hogan JA^{MMB}, Pierce JV, Klipp E, Kumamoto CA. The game theory of *Candida albicans* colonization dynamics reveals host status-responsive gene expression. *BMC Syst Biol*. 2016;10(1):20; PMID: 26927448.

Wong DS^{CMP}, Jay DG. Emerging roles of extracellular Hsp90 in cancer. *Adv Cancer Res*. 2016;129:141-63; PMID: 26916004.

Did we miss a post-doc or recent Sackler alum? E-mail us so we can update our lists: insight@elist.tufts.edu, Subject: Publications List

Hirsh Health Sciences Library on Social Media:



Tufts University Hirsh Health Sciences Library



TuftsHHSL

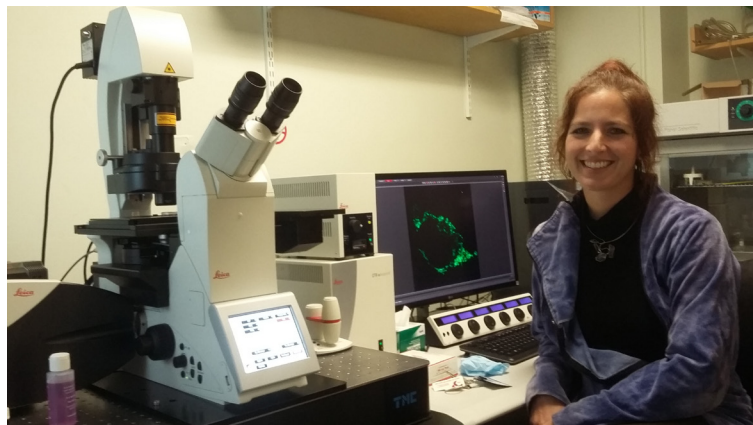
Top Techniques: Confocal Microscopy

by Alenka Lovy^{CNR Imaging & Cell Analysis Core}

What is confocal microscopy?

Reading and thinking about cell biology is very interesting no doubt, but I find that to be able to see biological processes by live microscopy just amplifies the questions at hand so much! Have you ever seen movies of cells dividing? I remember when I first did. It was hard to go from the picture perfect diagrams of the textbook to the real thing, but after a few times of watching the movies I saw the perfect (or not so perfect) progression through all the steps. Maybe it was the timing of it, or just being able to see the tangle of chromosomes trying to line up, and then the sudden division, I found it so breathtaking! Live cell microscopy has been my tool of preference to answer many biological research questions ever since.

Confocal microscopes in particular are powerful because they optically slice through a specimen (even live cells) and allow 3D image reconstruction in up to four different fluorescent channels. Confocals are built to scan point by point through your sample using laser light, and image just one particular plane of focus. This is very different to the standard fluorescent microscope which illuminates and images the entire sample at once, including out-of-focus light. The confocal is used to obtain clearer images of subcellular details that cannot be imaged with the fluorescent microscope and is especially useful for co-localization studies. There are many exciting techniques you can use with the confocal including fluorescence recovery after photo-bleaching (FRAP) with which you can observe protein mobility and recovery, fluorescence resonance energy transfer (FRET) which can show protein interactions, as well as photoactivation/uncaging studies.



However, if a small portion of the network is photoactivated and then imaged in z stacks over time, the signal can be monitored over time (bottom panel in the above figure). As the mitochondria fuse, the GFP protein becomes diluted in the larger volume of the network that has not been photoactivated, and the extent of dilution can be quantified and used as a measure of mitochondrial fusion.

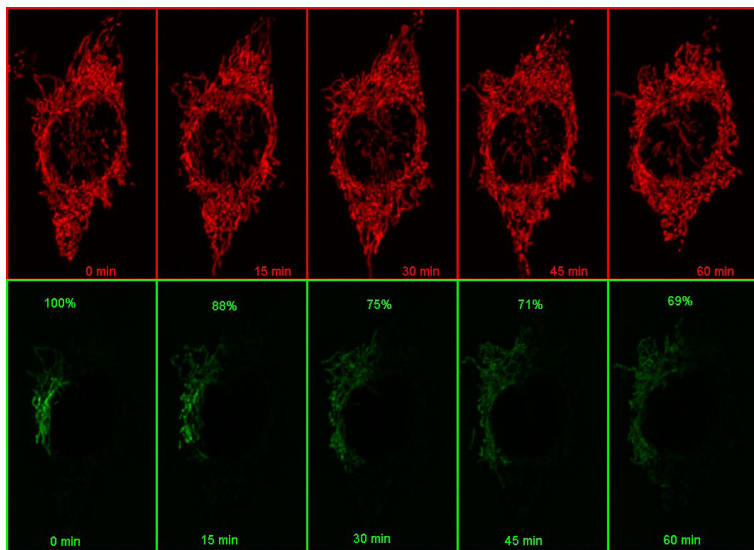
What facilities does Tufts have for confocal microscopy and other imaging techniques?

The Tufts Imaging Facility has four confocal microscopes and most are equipped with the standard 405nm, 488nm, 561nm and 633nm laser lines, which is important to know when choosing fluorophores. Using the Fluorescence SpectraViewer online will help you determine if the emission spectra of your fluorophores overlap such that crosstalk between them can be minimized. We have two inverted microscopes equipped for live cell imaging, and two upright microscopes that are usually used for fixed samples and 3D reconstructions. While imaging living cells, you can use an automated focusing mechanism which employs an infrared laser that keeps track of the coverslip, and therefore your sample. If you've ever had to adjust the focus yourself over several hours, you know just how powerful this feature is!

The **Nikon A1R inverted confocal** has a resonant scanner capable of high speed imaging (500 frames/sec at 512x512 pixel resolution) suitable for ion imaging and is being used for calcium imaging in cardiomyocytes. It also comes in handy during very long tiled scans with z-stacks, and although the image quality is slightly sacrificed, depending on the resolution needed, the gain in speed may well be worth it.

The **Leica SP8 inverted confocal** has a HyD sensitive detector and can be used with very low laser powers allowing longer imaging of easily bleached samples. For example, measuring how quickly a photoactivated GFP spreads within the mitochondrial network every minute over an hour would bleach the signal before all the information was collected on a regular detector compared to a HyD detector.

Another good technique to avoid bleaching in live cell imaging is to use the **total internal reflection microscope (TIRFM)**. On this microscope, you can adjust the angle of laser light with which you illuminate your sample. There is a particular angle at which all the laser light is internally reflected, except for a 100nm evanescent wave. With this you can then image processes close to the membrane, such as receptor insertion/cycling. [Continued on p. 7, "Top techniques"](#)



BOX 1

Using a photoactivatable GFP targeted to the mitochondria to measure mitochondrial fusion is a nice demonstration of the precision and quantitation that can be achieved using a confocal. Mitochondria are amazingly motile and networked and look like spaghetti. They also undergo constant fission and fusion, which can be difficult to capture. The top panel in the figure below shows the mitochondrial network (z stack) labeled with TMRE in HeLa cells imaged every 15 min for 1 hr. It is impossible to capture which mitochondria are fusing.

Zika Virus

Coming This Summer to a Mosquito Near You

by Ila Anand^{MMB}

A startling number of viral epidemics have made major media headlines in recent years. In 2014, the Middle Eastern Respiratory syndrome coronavirus (MERS-CoV) was quickly brought to America's attention after two reported cases in Indiana and Florida. 2015 was the year the world went into Ebola frenzy and U.S. hospitals took extreme precautions to manage suspected infected patients. This year, the Zika virus has caught the CDC's eye and for good reason. As Zika continues to spread from Brazil through the Americas, its arrival in the U.S. this summer is inevitable. Although no vector-borne cases have been reported inside the U.S. yet, over 150 travel-associated cases have been reported. Public health departments across the U.S. should brace for the next likely step: the moment when Zika passes from traveler-infected blood to a local mosquito and then to another person.

The Zika virus was first isolated in Uganda in 1947 from the Zika Forest, where researchers from the Rockefeller Foundation were studying yellow fever. These researchers experimentally used rhesus monkeys that were set out in cages in treetops as bait for mosquitos carrying yellow fever virus. Ironically, instead of yielding yellow fever virus from the blood of these monkeys, the researchers discovered Zika and speculated the virus had been lurking chronically in African monkeys for millennia. The virus was later isolated from mosquitoes of the *Aedes* genus in the same Zika forest and *Aedes* has since been identified as the vector of Zika. Eventually, Zika virus was discovered to infect humans across the African continent as well as in South Asia and Southeast Asia. More recently, circa April 2015, the virus has spread to the South America.

In humans, the virus manifests infection known as Zika fever, which often produces no symptoms to mild symptoms, such as headache, fever, rash, bloodshot eyes, and joint pain. Recently, the spread of Zika in South America has been linked to the growing number of infants born with microcephaly in Brazil. Microcephaly is a neurological condition in which the brain and skull fail to grow at a normal pace, resulting in a significantly smaller head size. At first the link to Zika was purely correlation, however, a recent report published in *Cell Stem Cell* directly demonstrated that Zika is able to infect and kill lab-cultured human neural progenitor cells. These neural progenitor cells were derived from induced pluripotent stem cells (iPSCs) and scientists tested the tropism of Zika by comparing percent infection



across four cell types: neural progenitor cells, immature neurons, embryonic stem cells, and human iPSCs. While less than 20% of iPSCs, embryonic stem cells and neurons became infected, up to 90% of neural progenitor cells contained the virus and Zika either killed these cells or slowed their proliferation significantly. These findings may begin to unearth some possible mechanisms to how Zika infects and damages fetal brain tissue. Since neural progenitor cells give rise to a larger population of neurons and glial cells in the brain, infection of these cells could impact the neurons they produce and possibly affect brain development. In addition to microcephaly, Zika has also been linked Guillain-Barré syndrome, a sickness in which the person's own immune system damages nerve cells, causing muscle weakness and sometimes paralysis. However, clinical findings from Brazil are still preliminary and there's a need for more compelling evidence.

Sources and additional information

H. Tang et al., "Zika virus infects human cortical neural precursors and attenuates their growth," *Cell Stem Cell*, doi:10.1016/j.stem.2016.02.016, 2016.
 History of Zika: <http://news.nationalgeographic.com/2016/01/160128-zika-virus-birth-defects-brian-damage-history-science/>
 CDC information on Zika: <http://www.cdc.gov/zika/index.html>
 Guillain-Barré disease: <http://time.com/4209612/zika-guillain-barre-syndrome-cdc/>

Top techniques: Confocal Microscopy, cont'd

Very often you can image a little bit deeper than the 100nm, and because the laser is at an angle, you will not bleach your specimen as fast. As opposed to confocal, the TIRF system has a sensitive EMCCD camera, enabling faster imaging (I have been looking at calcium sparks at 50 ms/frame).

The **Leica upright microscope** has water immersion objectives that have a large working distance and work well for thick cleared samples such as mouse brains or zebrafish embryos.

Finally, in addition to standard fluorescent microscopes, we also

have the **automated Keyence fluorescence microscope** which can scan up to 3 slides and stitch large images together in four channels as well as in brightfield. If large tiled scans are needed, this may be the instrument of choice due to the speed and ease of use.

For more information about the instruments in the Tufts Imaging Facility, please visit our website <http://medicine.tufts.edu/Faculty-and-Research/Core-Research-Facilities/Center-for-Neuroscience-Research/Cores/Imaging>. If you would like to use an instrument or need help planning an experiment please email me at Alenka.Lovy@tufts.edu.

If you'd like to learn more about microscopy in general, the Molecular Expressions Microscopy Primer is a great resource <http://micro.magnet.fsu.edu/primer/index.html>.

Sackler GSC holds advertised open meeting

While all GSC meetings are open, the last advertised was in 2013

by Nafis Hasan^{CMD}

The Sackler Graduate Student Council (GSC) meeting on March 3, 2016 was the first announced open meeting since 2013 to which the Sackler student body was formally invited to attend. While all GSC meetings are technically open to the student body according to the bylaws, the GSC meeting schedule is not widely advertised and is thus not usually attended by any Sackler students who are not also program representatives. This academic year, student club and organization leaders attend the first meeting, but March meeting was the first time that the GSC meeting was publicly advertised and Sackler students were formally invited. When asked about the motive behind this action, GSC President Michaela Tolman said, “We serve the students, so we wanted to offer a way in which they could express their opinions while also giving them a flavor of what GSC does and how it is run.” While the turnout was modest, she did mention that it was more than what she had expected.

Traditionally, GSC meetings mostly comprise of financial updates from the treasurer, different committees (career paths, social, newsletter, etc.) reporting on their previous events and discussing their future plans and setting up action items to be completed before the following meeting. This meeting followed the same pattern and after the committee updates, the floor was opened up to the guest non-GSC attendees.

Most of the non-GSC attendees shared that they were curious about the inner workings of the GSC and had either been invited to the meeting by a GSC member to the meeting or attended on their own initiative; some of them were also interested in joining the council the next academic year. Almost all class years and programs were represented in the attendee group.

Given that a major focus of the GSC in recent years has been to organize and hold events focusing on career building and networking, it was no surprise that most of the suggestions from attendees were focused on that topic. Suggestions were made for events to improve social media networking, seminars on data management and presentation skills and early stage career development, and most emphasis was placed on the interactive nature of the events and their diverse nature. Other suggestions included a consolidation of seminar schedule, especially student talks, across programs and departments, including the hospital seminars.

The GSC’s commitment on serving students manifests itself in its quick response to the students’ feedback at the meeting. CMP Program Representative Dan Wong has already put together a script that translates the Sackler Calendar event feed into a format that can be subscribed to in Google Calendar, Apple Calendar, Outlook, and many other similar programs. This allows members of the Sackler and Tufts community to view all of the upcoming seminars on the Tufts campus in a consolidated list integrated into their calendars. More details are available on [page 11](#), “[Sackler website calendar now available in iCal format](#)”. When asked about the outcome of the meeting, Tolman said, “I had no idea what people would bring up – which shows that we always need to seek student input. Some things were helpful for directing our current efforts – career paths heard positive things about



PHOTO BY DANIEL WONG

diversifying the type of events that they hold while also focusing more on skills. The coordination between programs was discussed, and I am really excited to put into action the student suggestions.” She also expressed hope that some of the attendees would join the GSC in the future, and that most, if not all, attendees would see GSC as “a fun and an exciting opportunity to take part in”.

Overall, the open meeting seemed to have served its purpose in getting student feedback. The necessity of such a meeting, at least once a year, was echoed by both the GSC President and the attendees; Tolman believes that a town hall-style meeting will be more effective in increasing student engagement and getting more input from students as “it would help better direct what we do and better serve the students’ needs”. Attendees who were contacted as a followup of the GSC meeting agreed that this year the GSC has become more interactive and applauded the various efforts GSC has undertaken to integrate students better and become more interactive, such as through The Goods e-mail format, the Instagram account and voting on the location for Relays.

The bylaws of the Sackler GSC clearly show that this organization is for the students and by the students, and therefore, there should be no doubt that increasing student engagement in not only its events, but also its governance should be made a priority. In the past, there have been GSC events where student attendance and engagement have fallen short of expectations, whether it be due to lack of advertising or a distancing of the GSC from the student body it represents. This publicly advertised open meeting is, in my opinion, a definite right step towards the actual fulfillment of this organization’s mission.

Sackler website calendar now available in iCal format

by Daniel Wong^{CMP}

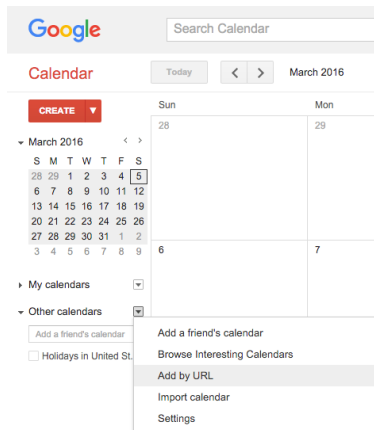
The Sackler calendar is a great resource for the community, but its current form does not follow Internet calendar format standards, which limits its utility. A majority of Tufts community members utilize digital calendar packages like Google Calendar, Apple Calendar, Microsoft Outlook, Mozilla Thunderbird, and others, to keep track of their schedules and subscribe to shared calendars, but the Sackler calendar cannot be used with these programs because it is served as an RSS feed and not an iCal one. The RSS standard was designed for syndication of articles and other news-like data, while iCal is the standard for Internet calendars. Fixing this mismatch will require structural changes to the Sackler website, but the timeline for such changes is not known.

To solve this problem, I have written a script that automatically retrieves the publicly available event information from the Sackler calendar and presents it in a format that calendar programs can utilize. I've also made some improvements to the presentation of events, so seminar title will now appear in the event name if it is available. Additionally, the room number will appear alongside the building address in the location field of the event, and has been formatted in a way that allows mapping programs to ignore the room and focus on the address if directions are needed. This code will work until the Sackler calendar URL or the event information formats change, but my hope is that the script will no longer be necessary once that happens. The iCal feed is available at <http://sackler.danielsenhwong.com/calendar.ics>, and can be imported as a calendar subscription in most calendar software packages. This feed is set to automatically update every morning at 4 AM, but the refresh frequency of common calendar programs varies. Instructions for some of the most popular applications are included below. This calendar is not compatible with either Outlook 2011 for Mac or the Outlook Web App (2010) available from Tufts at <http://exchange.tufts.edu> for reasons that are beyond my control, but should work with Outlook 2007 and newer versions for Windows.

The Sackler calendar is only as useful as the information that is provided to it, so individuals responsible for planning and scheduling events should continue to submit their event information to it by using the website form: <http://sackler.tufts.edu/Calendar/Submit-an-Event>

Google Calendar (calendar.google.com)

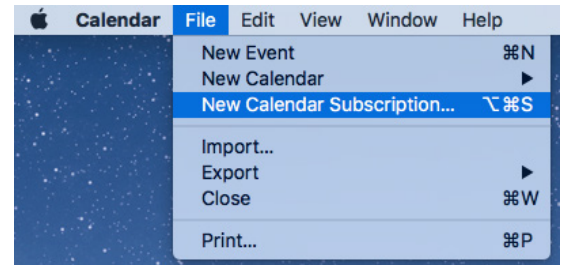
Adding an iCal feed to Google Calendar To add the Sackler calendar to your list of calendars, open Google Calendar. Click the downward-pointing triangle to the right of "Other Calendars" that appears along the left side of the page, and select "Add by URL" from the menu. Enter the URL <http://sackler.danielsenhwong.com/calendar.ics> in the text box and click "Add Calendar". The new calendar should appear in the list, and the events will populate your calendar in a



few seconds. Google Calendar will refresh this feed every few hours. The iCal feed can only be added to Google Calendar from a computer, and not the Android mobile phone application.

Apple Calendar (Apple OS X)

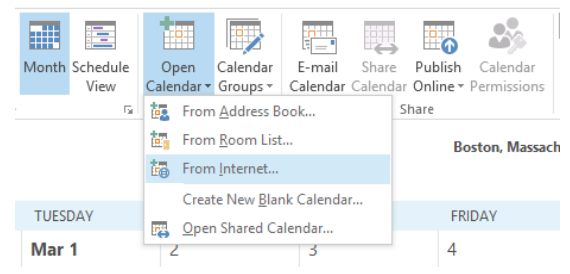
Adding an iCal feed to Apple Calendar To add the Sackler calendar to your list of calendars, open Apple Calendar, and select "New Calendar Subscription..." from the "File" menu. Enter <http://sackler.danielsenhwong.com/calendar.ics> as the Calendar URL in the text box and click "Subscribe". The new calendar should appear in the list, and the events will populate your calendar in a few seconds. By default, Apple Calendar only updates calendar subscriptions once per week. To change the update frequency, right-click (Control+click) the "Sackler Website Calendar" entry in the list of calendars and select "Get Info". The update frequency can be changed by selecting a different interval from the "Auto-refresh" option list.



Subscription..." from the "File" menu. Enter <http://sackler.danielsenhwong.com/calendar.ics> as the Calendar URL in the text box and click "Subscribe". The new calendar should appear in the list, and the events will populate your calendar in a few seconds. By default, Apple Calendar only updates calendar subscriptions once per week. To change the update frequency, right-click (Control+click) the "Sackler Website Calendar" entry in the list of calendars and select "Get Info". The update frequency can be changed by selecting a different interval from the "Auto-refresh" option list.

Microsoft Outlook 2013

Adding an iCal feed to Microsoft Outlook To add the Sackler calendar to your list of calendars, open Outlook and go to the Calendar pane. Select "Open Calendar" and "From Internet..." from the middle of the "Home" ribbon across the top of the screen. Enter <http://sackler.danielsenhwong.com/calendar.ics> as the Calendar location in the text box and click "OK". The "Advanced..." button will open a menu allowing you to change the name of the Calendar and the description I have provided. Click "Yes" to subscribe to the calendar. The new calendar should appear in the list, and the events will populate your calendar in a few seconds, after Outlook finishes processing the feed.



Mozilla Thunderbird (mozilla.org/thunderbird)

To add the Sackler calendar to your list of calendars, open Thunderbird and go to the Calendar view. Select "New..." then "Calendar..." from the "File" menu. Select "On the Network" as the location for the calendar, and then click "Continue". Select "iCalendar (ICS)" as the format, and enter <http://sackler.danielsenhwong.com/calendar.ics> as the location in the text box and click "Continue". Thunderbird doesn't read the given calendar name, "Sackler Website Calendar", from the iCal feed, so give the calendar a name of your choice and click "Continue" to complete the process.

Tufts Innovation Spotlight

What: Cocktail reception showcasing Biomedical Innovators of 2015

When : March 15th 5pm, Panel Discussion at 6pm

Where: Abby Lane, 255 Tremont Street, Boston, MA

**“There’s a way to do it better - find it.”
-Thomas Edison**



Guests: Qiaobing Xu, PhD (Tufts) Richard Lee, MD (Harvard)
Arnout Schepers, PhD (MIT) Retsina Meyer, PhD (Resilience Therapeutics)
Luhan Yang, PhD (eGenesis)

Tufts Innovation Spotlight

Next week Tuesday night, over 50 people have already signed up for a first-ever event. Have you? (<https://tuftsinnovationspotlight.eventbrite.com>). Tufts Innovation Spotlight is bringing together 5 panelists who have brought innovation to the academic, clinical, and industry settings. Their achievements and wisdom will be celebrated with this classy event hosted by the Graduate Student Council at Abby Lane (<http://www.abbylaneboston.com>), which is right around the corner (literally a 6 minute walk).

The event will begin at 5pm with passed hors d'oeuvres on the upper floor of Abby Lane. The program will begin at 6pm with a panel discussion. There will be an opportunity for questions throughout as well as open networking from 7pm on. The goal of the event is to generate a discussion among students and panelists about the challenges they have faced bringing innovation to each of their respective fields and how they would advise our students as they strike out on their own careers.

Qiaobing Xu, PhD (<http://engineering.tufts.edu/bme/people/xu/>) is an Assistant Professor at Tufts. He received his PhD from Harvard in Biochemistry, did a post doc at MIT, and now focuses on developing nanotechnology for the applications of drug delivery and tissue engineering. His lab has developed “lipidoids” for delivery of DNA, RNA, or protein for therapeutic applications. Their tissue engineering efforts have resulted in a scaffold built from decellurized tissue which is currently being used to guide tissue regeneration.

Richard T. Lee, MD (<http://hsci.harvard.edu/people/richard-lee-md>) is a Professor at Harvard University and Harvard Medical school, as

well as an active clinician at Brigham and Women’s Hospital, founder, and Chairman of the Board of ProteoThera, Inc (<http://www.proteothera.com/>). Dr. Lee received his medical degree from Cornell University and went on to study a broad range of medical issues. Their approach is to, “understand human problems and design solutions in the laboratory.”

Arnout Schepers, PhD (<https://lmrt.mit.edu/about/group-members>) is a post doc in the Bhatia Lab at MIT. He received his PhD from Hubrecht Institute in Utrecht in Hans Clevers laboratory. Previously, he has characterized intestinal stem cells in malignant conditions. Currently, he is working on making a 3D tissue model for cancer research.

Retsina Meyer, PhD (<http://www.resiliencetx.com/retsina-meyer/>) is a senior scientist at Resilience Therapeutics. She received her PhD from MIT, where she won numerous fellowships and excelled in the entrepreneurial arena, winning the OneStart America’s competition. Resilience Therapeutics is currently developing a target for treating post traumatic stress disorder (PTSD).

Luhan Yang, PhD (<http://www.egenesisbio.com/founding-team.html>) is a Co-Founder of the biotech company, eGenesis. She received her PhD as well as a post doc position from Harvard. She was named on the list “30 under 30” in Forbes Magazine and helped develop the CRISPR/Cas9 system for use in mammalian cells.

We hope you join us on Tuesday, March 15th!

The versatile PhD

GRADUATE STUDENTS:

Worried about your future?

Thinking about non-academic careers?

There is a resource for YOU!

Versatile PhD - a Non Academic Career Resource for Doctoral Students

Versatile PhD, a tool for graduate students to explore non-academic careers, began as a listserv while Founder and CEO Paula Chambers was finishing her dissertation at Ohio State University. Her goal was to create a safe space where PhD students could discuss non-academic career options without feeling pressured to go into academia. From this original idea, the company has blossomed into an active resource where PhD's from all backgrounds can come together in a supportive environment to learn, discuss, and network based on their interest.

While most of the website content is unavailable without a subscription, the website still has much to offer for those beginning to explore career options outside of academia. The PhD Career Finder lists many career opportunities available to STEM and Humanities PhD's with information about what the career entails, how to advance, what background is best suited for the career, and how best to prepare yourself and your resume for following that path. It is an excellent

resource for those who are interested in exploring what their future options are.

Additionally, with a paid subscription you gain access to resumes and cover letters and narratives from of the hiring process from real PhDs. You can post questions to any of the Forums, and network with members within the Versatile PhD network. While Versatile PhD is a national business, they also run regional meetups, where you can network in person.

So how can this site help you as a Tufts student or postdoc? Come to hear Paula herself speak about the mission, founding, and resources that Versatile PhD has to offer on **March 16** (<http://sackler.tufts.edu/Calendar/2016/03/16/GSC-Career-Paths-Seminar-Paula-Chambers.aspx>). Additionally, we will be hearing from Tufts postdoc and Versatile PhD Volunteer Sarah Dykstra on how she uses and benefits from Versatile PhD.

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Contributors: Contributed substantial content this year, and not a GSC program representative.

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Guest Writers: Contributed a single long article or a few short articles this year aside from club updates, and not a GSC program representative.