BCHM Lab Profile Pamphlet

Brandeis is probably the only institute of its caliber so committed to allowing undergraduate students to start graduate-level type of research. Performing research is an amazing experience, and all those who are interested should try their hardest to apply—and remember, there are plenty of faculty in the departments of Biology, Chemistry, and Biophysics to ask for lab positions as well.

The best method to go about contacting any senior faculty member here in the Biochemistry department, or in any of the sciences at Brandeis, is to send a well-thought-out email.

**What should this email include?**

First of all, it is a formal email, so address the recipient(s) as “Dr.” or “Professor” and be sure to get to your point within the first two sentences. Many of the faculty members are busy and don’t want to read a novel. Your entire email should be no more than a paragraph in length.

Once you state whom you are, your year, and your interest in the lab, it’s time to start to grease the wheels. Why do you want to work in the lab? Are you particularly interested in the proteins or mechanisms in question? Why? Are you particularly interested in the method of research (x-ray crystallography, bioinformatics, computer modeling, NMR, etc.)? Why?

Next, talk yourself up! Why would you make a good member of the lab? What would you bring to the table? What is your past experience? Your drive? Your creativity? What sets you apart from the others? This is a beauty contest—make them want you! Finally, Thank them for their time, and end the letter with a short sing-off. Don’t say “Have a nice day.” Professors don’t want to be told what to do. Then attach a resume, PROOFREAD YOUR WORK, and hit the send button.

“But Ari, Sophie, and Frank, I don’t have a resume, nor do I know how to write one!”

Well, luckily, we have the Hiatt Career Center here on campus with experts and professionals whose only job is to get you a job. Make an appointment and get help! We all need it, and most Brandeis scholarships and jobs you’ll want to apply for will require you to get your resume “Hiatt Approved” anyways.
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**Your Letter**

1) Who are you?

2) Why are you emailing!?

3) What’s your interest in this particular lab?

4) Why are you a good fit for the lab?

5) Thank the faculty member for their consideration and make sure to note that you have attached your resume.

6) PROOFREAD YOUR LETTER!

7) Press the send button.

One should never put all one’s eggs in the same basket, so you should probably choose three or more labs to send letters to. Make sure to customize each letter. Faculty members talk to each other, so copying and pasting will not do. The resume, though, does not need to be customized; a Hiatt-approved resume should fit for any lab. You should expect an answer within two weeks of sending the email. However, faculty members are always busy and often distracted. If you do not get a response, don’t take it personally, but if you are really interested in the position, try visiting them in person. For more information on any of the professors listed (and then some), you can go to the Life Sciences web page:

   [http://www.bio.brandeis.edu/faculty/list_deptBiochem.php](http://www.bio.brandeis.edu/faculty/list_deptBiochem.php)

Good luck! Remember that the faculty here at Brandeis are not monsters. They love talking to students. Not just about working in their lab, but about life in general; it’s very easy to start a dialogue. You’re parents are paying a lot of money for you to have that kind of attention! Also if you have any questions, DO NOT HESITATE TO CONTACT ANY OF YOUR UDRs!

Ari Salinger ‘12                         arijsal1@brandeis.edu
Frank Scangarello ‘12                   fascang@brandeis.edu
Sophie Travis ‘13                       btsophie@brandeis.edu
BCHM Lab Profile Pamphlet

Lab: Jeff Gelles   Email: gelles@brandeis.edu

Office Location: Kosow-Wolfson 208

Current Undergrads in Lab: Nate Shammay

Favorite Class to Teach: “I like all the classes I teach; I don't think I have a favorite. Each has its own challenges and rewards.”

Primary Research Focus: Use single-enzyme dynamics to discern enzyme mechanisms that cannot be detected through more traditional static structural studies (such as crystal structures). Researches motor proteins, spliceosome units, and transcription.

Laboratory Mission Statement: “We use single-molecule techniques to discover the mechanisms of complex biochemical processes.”

Philosophy on Undergraduate Education: “Life is uncertain and you never know where your career and interests will take you. My advice to undergraduates interested in biochemistry is to get as broad an education in mathematics and all the sciences (and in other areas!) as they can.”
BCHM Lab Profile Pamphlet

Lab: Nikolaus Grigorieff
Email: niko@brandeis.edu

Office Location: Rosenstiel 448

Current Undergrads in Lab: Tuen-Wing (Erin) Fan

Primary Research Focus: High-resolution electron microscopy done at low temperatures (electron cryo-microscopy) to explore the structure of macromolecular complexes such as ribosomes.

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1 Dr. Grigorieff is on sabbatical until June 2012. He will not be accepting e-mails or phone calls until then.
BCHM Lab Profile Pamphlet

Lab: Dorothee Kern²  
Email: dker@brandeis.edu

Office Location: Volen 444

Current Undergrads in Lab: Lien Phung and Padraig Murphy

Favorite Class to Teach: BCMH 102

Primary Research Focus: Primarily uses nuclear magnetic resonance (NMR) spectroscopy whereupon magnetic frequencies are measured from various elements (often hydrogen). This is performed to discern the movement of enzymes as they catalyze chemical reactions as well as to analyze how proteins convert to and from their active conformations.

Laboratory Mission Statement: “Do things in life with passion and joy.”

Philosophy on Undergraduate Education: “For me, undergraduate students, graduate students, postdocs, professors are all scientists. I do not believe in hierarchy, we try to discover how biology works together as a team. One never stops learning.”

² Dr. Kern is the Department Chair for Biochemistry
BCHM Lab Profile Pamphlet

Lab: Chris Miller

Email: cmiller@brandeis.edu

Office Location: Volen 415

Current Undergrads in Lab: Rebecca Goldblum

Favorite Class to Teach: “Physical Chemistry (CHEM 141 or BCHM 104a,b)”

Primary Research Focus: Studies the generation of cellular electricity through elucidation of the mechanisms regulating the opening and closing of ion channel proteins. To understand the mechanisms that underpin selectivity for certain ions over another. The main proteins being researched are K⁺ channels and CLC Cl⁻ Channels.

Laboratory Mission Statement: “We try to understand how membrane proteins manage to select and move specific molecules across cell membranes.”

Philosophy on Undergraduate Education: “You've got to keep students (1) interested in what you're trying to teach and (2) working hard to internalize the concepts.”
BCHM Lab Profile Pamphlet

Lab: Dan Oprian\(^3\)  
Email: oprian@brandeis.edu

Office Location: Volen 407

Current Undergrads in Lab: Sonya Entova and Andrew Mui

Favorite Class to Teach: “BCHM 100 and BCHM 104a”

Primary Research Focus: To determine the active site structure of the major visual pigments in the human eye and understand how structural amino acids influence light absorption in order to elucidate the biochemical mechanism of some genetic retinal diseases.

Laboratory Mission Statement: “My laboratory is trying to understand the molecular mechanisms underlying phototransduction in the vertebrate retina.”

Philosophy on Undergraduate Education: “I think it is most important that undergraduates gain a very solid and broad based education in the fundamentals of their field. For a Biochemistry major this would mean emphasis on the chemical and physical principles underlying biology.”

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\(^3\) Dr. Oprian is the Undergraduate Advising Head for Biochemistry
BCHM Lab Profile Pamphlet

Lab: Gregory Petsko & Dagmar Ringe

Email: petsko@brandeis.edu
ringe@brandeis.edu

Office Location: Rosenstiel 653 and 654

Current Undergrads in Lab: Mehraj Awal, Sarah Azarchi, Chet Berman, Lauren Dong, Andrew Jung, Jay Patel, Tom Phan, Inna Prokupets (joint with the Agar lab), Jordan Talan, Sophie Travis, and Tianchi Tu

Favorite Class to Teach: Greg: “I would say Critical Thinking, but I don't get to teach it very often. I also enjoy any chance to teach a liberal arts course (I've taught a few), because it's such a great change of pace.”

Primary Research Focus: Use x-ray diffraction to analyze protein structure and enzyme mechanisms. Explore structures of enzymes and enzyme-substrate complexes. Recent publications on Lou Gehrig’s Disease (ALS) and Parkinson’s.

Laboratory Mission Statement: “That's easy: Focus on training and creating an environment in which learning is fun and people develop the confidence that they can learn. Everything else (research accomplishments, publications, etc.) is just the report card on how well you do that.”

Philosophy on Undergraduate Education: “I'm not a believer in having people memorize facts (though some have to be learned, of course). I try to teach concepts, and then give students opportunities, in tests and problem sets, to apply those concepts to cases they haven't seen before. It's challenging for them, and can be frustrating, but in the end, when it works, they emerge with a confidence that they can never get from regurgitating stuff they will only forget soon afterwards. I also believe it's essential for science students to take lots of courses in the arts, humanities, and social sciences. Most of my success and nearly all of my creativity can be traced to things I learned in those courses, not my science courses. The idea of undergraduate education, especially at a place like Brandeis, should not be to produce specialists (at least not most of the time), but rather to produce broadly-educated people who are best equipped to deal with a rapidly-changing, unpredictable future.”

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4 Dr. Ringe is on sabbatical until Spring 2012
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Lab: Daniel Pomeranz Krummel
Email: dapk@brandeis.edu

Office Location: Kosow-Wolfson 206

Current Undergrads in Lab: Ari Salinger and Tianyun Wu

Favorite Class to Teach: “I developed and taught now twice a new course, ‘Information transfer mechanisms’ (BCHM 103). The course covers the structure of nucleic acid-proteins, nucleic acid-protein interactions, and the structure and mechanism of the proteins involved in packaging DNA, DNA replication, RNA transcription, RNA processing, and translation. The course integrates use of a 3-D projector to illustrate the structure-function relationship in detail.”

Primary Research Focus: In vitro RNA biochemistry and structural studies concerning the maturation of pre-mRNA (splicing). Mostly concerning the structural determination of the human spliceosome. Also does work on cell stress response.

Laboratory Mission Statement: “My laboratory is interested in various aspects eukaryotic gene regulation. Specifically, we are interested in the structure-function of the pre-mRNA splicing machinery (the spliceosome); how the cell regulates RNA function when exposed to stress; and possible contributions of RNA processing to development of neurodegenerative disorders.”

Philosophy on Undergraduate Education: “The student must bring forth with him/her an open mind and an interest in the subject. The instructor/professor’s role is to assist/guide a student in becoming well grounded in the fundamentals of a subject and to ‘feed his/her fire.’ In a laboratory setting, student and mentor engage in a dialogue, a more personal exchange so as to see to his/her development in the oral, written, and experimental aspects of research. Well rounded intellectually and experienced experimentally, the student will be ready to become independent, to fly on his/her own.”
BCHM Lab Profile Pamphlet

Lab: Doug Theobald  Email: dtheobald@brandeis.edu

Office Location: Kosow-Wolfson 308

Current Undergrads in Lab: Amy Eisenberg, Adam Drake, Emily Chen, and Judy Kaufmann

Favorite Class to Teach: “BCHM 104”

Primary Research Focus: Structural investigation of telomeric complexes by using computer programs that do comparison analysis (bioinformatics). This takes into account molecular evolution, and structure-function studies. Work also integrates X-ray diffraction of proteins crystals for structure determination.

Laboratory Mission Statement: “We want to acquire a detailed, mechanistic, atomic resolution understanding of how macromolecular structures (and the functions they perform) have evolved.”

Philosophy on Undergraduate Education: “Give students the ability to be mitigated skeptics. This is something that has to be learned and practiced (or rather, it involves a considerable amount of un-learning). The key is balance, in ascertaining the difference between skepticism and cynicism. In practice, this involves giving my undergrads real research projects -- difficult problems/questions that currently have no solution/answer.”
BCHM Lab Profile Pamphlet