



Skill Development for Diverse Scientific Careers-Spring 2017 B&BS 550b

Yale University and the Yale School of Medicine



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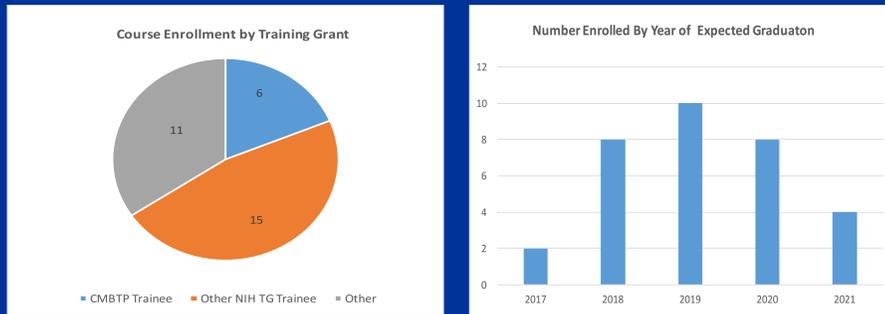
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MOTIVATION

We have used this Administrative Supplement to develop a new course for our PhD and MD/PhD students: **Skill Development for Diverse Scientific Careers**. The 2012 Biomedical Workforce Report concluded that our traditional training programs do little to prepare our students for the wide variety of scientific and biomedical career options open to them. We designed a new course that will address topics that were not covered in any curriculum at Yale: biotechnology entrepreneurship; how to run clinical trials, both in academia and in pharma; the business and scientific sides of biotech; strategies for optimal professional productivity; how to convert a CV into a resume; and how to find a post-doctoral fellowship or research residency. Our goal is to teach trainees skills that trainees can use in a variety of diverse scientific careers. This course will serve as a valuable new resource for all of our students as they transition into the biomedical workforce.

The Skill Development for Diverse Scientific Careers Course has Benefited Many Different Ph.D. and MD/PhD Students at Yale



Slide from: **Strategies to Increase Productivity in Biomedical Science**, Instructor: Anthony Koleske, Ph.D., Professor of Molecular Biophysics and Biochemistry and Director of the Combined Programs in the BBS

To optimize productivity, you need to be healthy

Avoid getting sick:
Get enough sleep, eat healthy, do other things.....

Eating healthy:
Good: Whole grains, vegetables, lean protein, fruits, legumes, nuts,
Bad: too much salt, sugar, alcohol, drugs

Get regular exercise, go outside:
Keeps you fit, reduces stress, helps executive function, improves brain function.

Have healthy and supportive relationships:
Friends, family need to understand how important getting your work done is to you.

In the Spring of 2017 we will offer a new course that will address topics that are not currently covered in any curriculum at Yale: biotechnology entrepreneurship; how to run clinical trials, both in academia and in pharma; the business and scientific sides of biotech; strategies for optimal professional productivity; how to convert a CV into a resume; and how to find a post-doctoral fellowship or research residency. The course will be graded satisfactory/unsatisfactory based on 80% attendance. For feedback, please take the Qualtrics survey at the end of each session or speak with one of the organizers.

- January 17, 2017 **Transitioning from academic research to a career in biotechnology.**
Instructor: Margaret Kiss, Ph.D., Director of Molecular Sciences, AxioMx, Inc.
- January 24, 2017 **Your personal marketing plan: how to write a resume tailored to your career search.**
Instructor: Hyun Ja Shin, Ph.D., Office of Career Strategy.
- January 31, 2017 **Planning and performing a randomized controlled clinical trial.**
Instructor: Loren Laine, M.D., Professor of Medicine (Gastroenterology).
- February 28, 2017 **Skill development for the business side of biotech/pharma.**
Instructor: Rachael Felberbaum, Ph.D., Senior Director of Business Development, Protein Sciences Corporation.
- March 28, 2017 **Entrepreneurship in the life sciences.**
Instructor: Leonard Bell, M.D., Chairman of the Board of Directors, Alexion Pharmaceuticals, Inc.
- April 4, 2017 **Choosing and applying for research residencies and fellowships: paths to basic, translational and clinical research careers for physician-scientists.**
Instructor: Barbara Kazmierczak, M.D., Ph.D., Associate Professor of Medicine & Microbial Pathogenesis and the Director of the MD/PhD program.
- April 11, 2017 **How to take the first step: Phase I clinical drug trials.**
Instructor: Patricia LoRusso, D.O., Professor of Medicine (Oncology).
- April 18, 2017 **How to find, apply and interview for a post-doctoral fellowship.**
Instructor: Susan Baserga, M.D., Ph.D., Professor of Molecular Biophysics & Biochemistry, Genetics and Therapeutic Radiology; Program Director for the Predoctoral Program in Cellular and Molecular Biology.
- April 25, 2017 **Effective use of 'big data' in research: large numbers are useful but they aren't a cure all.**
Instructor: Amy Justice, M.D., Ph.D., Professor of Medicine and of Public Health.
- May 2, 2017 **Strategies to increase productivity in biomedical science.**
Instructor: Anthony Koleske, Ph.D., Professor of Molecular Biophysics and Biochemistry and Director of the Combined PhD Programs in the BBS.

Slides from: **Transiting From Academic Research to a Career in Biotechnology**, Margaret Kiss, Ph.D., Director of Molecular Sciences, AxioMx, Inc.

Developing skills for success in biotechnology

Developing Leadership and Management Skills

- Supervise undergraduates or less experienced graduate students
- Manage a project involving multiple scientists
- Be a mentor in a formal program
- Start something (eg. a journal club, biotech club, etc.)

Developing Teamwork and Collaboration

- Collaborate with another lab, in another field maybe, and publish
- Join a lab that has multiple collaborations, even with industry labs
- Work on a big project that relies on a division of labor
- Serve on a committee and do something big like plan a conference

Developing Communication Skills

- Teach classes
- Go to workshops and conferences- Give a talk or present a poster
- Practice your English if needed, eg. go to ESL classes
- Practice your presentation skills (lab meetings, research in progress talks, conferences, etc.)
- Write papers and grant proposals

Developing Innovation and Creativity

- Pursue speaking invitations by inviting others (eg. be on a speaker committee)
- Follow industry publications like FierceBiotech to "learn the trends"
- Attend events with local networking and trade organizations (eg. Cure)

APPROACH

We have run the **Skill Development for Diverse Scientific Careers Course** over 10 weeks in the spring semester, meeting once/week from 5-6:30 PM, beginning in Spring 2017. So as not to increase the course-taking burden on our students, the course was optional, and students were able to attend individual sessions. We advertised the course via the Biological and Biomedical Sciences (BBS) newsletter, through the MD/PhD program, by each graduate department, and on posted fliers. Course materials were distributed via a web-based system for each session. The sessions combined didactic presentations (45 min) with faculty led discussion and networking opportunities. Course credit (Satisfactory/Unsatisfactory) was awarded to every student who attended 80% of the sessions, and who had registered for the course. This Administrative Supplement to T32GM007223 was an important catalyst to put this new course in place on an ongoing basis.

COURSE EVALUATION, ASSESSMENT, AND OUTCOMES

Each session was evaluated individually with a Yale Qualtrics web-based survey. It consisted of 5 questions with radio buttons for "yes", "no", and "maybe" as answer choices. We included a write-in box for additional comments. The 5 questions were: "Did the presentation expose you to new options for your future career in biomedical science?" "Was it clear what roadmap such a career path might take?" "Are you considering this option as a potential career path?" "Was it clear how you would gain the necessary skills?" "Was there adequate time for discussion and interaction with the speaker?" As an additional method of assessment, one of the co-course directors, Drs. Baserga, Kazmierczak or Koleske, attended each session. Overall, student feedback indicated that the course was a success.

LESSONS LEARNED

- The most useful section of the course evaluation was the comment section, as that provided concrete suggestions for changes.
- Next year we will be adding a new session on careers in publishing and scientific writing.

ACKNOWLEDGEMENTS

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