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Natural Selections

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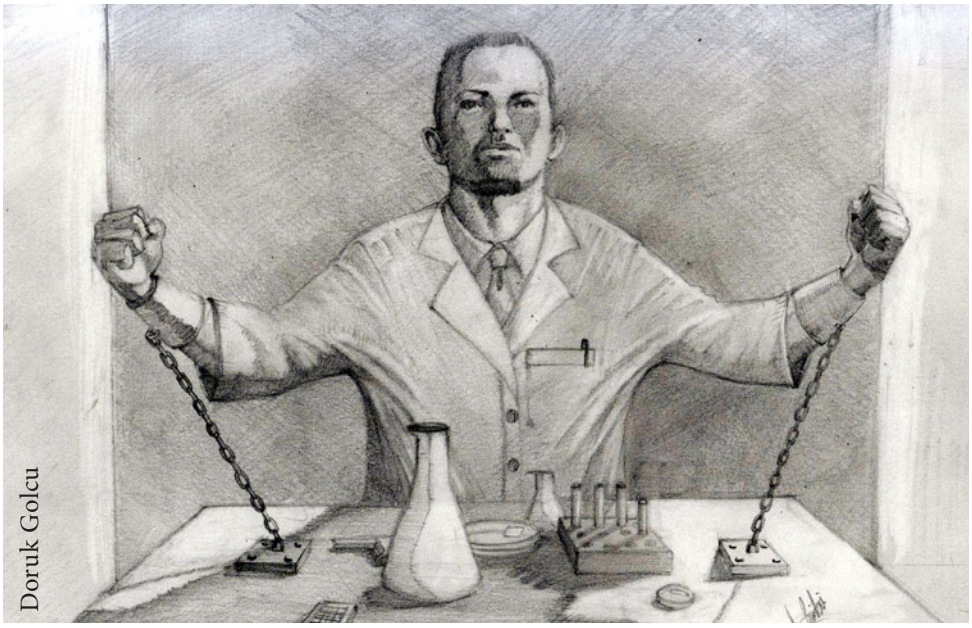

Doruk Golcu

In conversation with RU researchers: What makes a good scientist?

Prerana Shrestha

Now that more people are entering science for vocation than ever, it has become pertinent to ponder over what exactly constitutes a good scientist. *Natural Selections* recently interviewed a representative sample of Rockefeller researchers in various stages of their scientific career on the somewhat vague concept of a good scientist. Highlights of the interview are presented here. This is the first part in a two-part series of conversations carried out with RU researchers; the second part will be published in a later issue of *Natural Selections*.

***Natural Selections (NS):* Who do you admire as a scientist, either living or deceased, and why?**

Elaine Fuchs (EF): I have been fortunate to have many important role models in my scientific life. As a graduate student at Princeton, I learned molecular biology through one of my professors, Bruce Alberts. He gave us confidence to ask questions and focus on learning rather than worrying about embarrassment. Later at UCSF, Bruce initiated programs to bridge high school biology with UCSF biologists and also edited *Molecular Biology of the Cell*. Subsequently, Bruce accepted the presidency of the National Academy of Sciences and made outstanding progress both nationally and internationally in improving science education in K-12 [Kindergarten through grade 12] schools, in government, and in developing countries. He is a scientific leader in the true sense, and he has always led by example. I also have tremendous admiration for a trio of women. Janet Rowley won the Lasker Award for her work on chromosomal breakpoints in cancer, raised four children, and yet always sent me a handwritten note of congratulations whenever I accomplished something which was insignificant compared to hers. She taught me the importance of mentorship. I also greatly admire Shirley Tilghman, who taught in the Peace Corps in Sierra Leone, became a world-renowned scientist and a pioneer in mouse genetics, and is now president of Princeton [University]—she set the standard for a great compassionate leader. Last but not least is my admira-

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SIGNIFICANT STATISTICS FOR SCIENTISTS

Sriram

Key decisions such as faculty recruitment, granting of tenure, awarding of grants, and election into scientific academies should be taken on the basis of merit. While the criteria used for such decisions are multifaceted and subjective, there is an evident rationale—if not for fairness and transparency, then for sheer convenience—for using simple, objective metrics for comparing individual scientists. Likewise, objective criteria for comparing journals are often used as a proxy for the scientific quality and importance of the papers published in a particular journal as well as to determine whether it is worthwhile for a library to subscribe to that journal. What are these metrics and how reasonable and effective are they?

Journal Rankings

Most readers of *Natural Selections* would be aware of the impact factor, which is described by its publishers as a "quantitative tool for ranking, evaluating, categorizing, and comparing journals"[1]. The impact factor of a journal in a particular year (say 2006) is the ratio A/B, where A is the total number of citations in 2006 to articles published in that journal in 2004-05 and B is the total number of citable articles published in it during 2004-05 [1,2].

Impact factors have a tremendous influence on both scientists and publishers of journals. Publications in high-impact journals are often a pre-requisite for getting tenure and promotions and, in some countries, researchers may even be rewarded for such publications[9]. Impact factors also guide the choice of journal to which a paper is submitted. Journal publishers also adopt various means to improve their impact factor, such as increasing the number of review articles (which are cited, on average, more

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than primary literature) and "suggesting" authors to cite articles in their journals[9].

While a high impact factor indicates a high rate of citation on average, not all articles in a journal are equally cited. In fact, the distribution of the number of citations is highly skewed. According to an editorial in the journal *Nature*[6], a mere 25% of the papers published in 2002-03 accounted for 89% of the citations made to *Nature* articles in 2004, and a "great majority" of the papers had fewer than twenty citations. In other words, most of the articles had a "low impact." While these articles might be widely read on account of being published in *Nature*, they were rarely cited in future work. The impact factor of a journal should, therefore, never be used as a proxy for the "citation impact" of individual papers.

Nevertheless, impact factors are a fair measure of the popularity of a journal. They, however, do not necessarily reflect the prestige of the journal amongst the scientific community, a fact substantiated by the preponderance of dedicated review periodicals amongst the highest impact journals. Recently, Bollen et al suggested that a modified version of the PageRank algorithm, the algorithm used by Google to rank web pages, could be used to gauge the prestige of journals[4]. While the impact factor calculation treats all citations to a journal equally, the PageRank algorithm gives more weight to citations from prestigious journals (the algorithm is iterative, since a prestigious journal is defined as one with a high PageRank). The authors also proposed a third metric, the Y-factor, defined as the product of the PageRank and the impact factor of a journal, which was claimed to be an even better yardstick for prestige. For instance, based on data on citations in 2003 to articles published in 2001-02, the five journals with the highest Y-factor were *Nature, Science, The New England Journal of Medicine, Cell,* and *PNAS*. In fact, the paper concludes with the remarkable assertion that "the intuitive and simplistic definition of the Y-factor rankings may not be scientifically convincing, still the authors were more than slightly intrigued to find that the top scoring journals according to this ranking principle rather closely matched their personal perception of importance"[4].

Measuring Individual Scientific Achievement

As mentioned in the beginning of this article, the assessment of the scientific prowess of an individual is essential in taking many key decisions in academia. There are at least two sources of information that might facilitate such an assessment: (1) the opinions of colleagues and those of other scientists working in the same field, and (2) the publication record of the individual. Of these two, it is only the latter that is amenable to objective evaluation.

When comparing publication records of scientists using an objective criterion, it is useful to have a metric that balances quantity (number of publications) and quality (the impact of publications). The metrics that have been traditionally used to evaluate scientific performance tended to favor one of these two criteria. For example, metrics like total number of publications or publications per year do not take the quality of publications into account. On the other hand, a metric like number of citations per paper measures quality and can be skewed by a rare, high-impact publication. Moreover, metrics dependent on total number of citations can be manipulated by publishing several review articles. Other metrics, like the number of "significant" papers, while being more balanced, require specification of arbitrary parameters which define significance.

To have a metric that favors sustained, quality scientific output without requiring arbitrary parameters, J. E. Hirsch devised the h-index[3,5]. The h-index of a scientist is h if h of his total N papers are cited at least h times each, while the remaining (N-h) papers are cited at most h times each. For example, if a researcher has published 30 papers in all, and has an h-index of 12, then the 12 best papers (in terms of number of citations) would have been cited at least 12 times each, while the other 18 would have been cited at most 12 times each. The reader may use the Web site indicated in reference 11 to find the h-index of any scientist. A high h-index typically signifies a publication record containing influential papers throughout an individual's career. To illustrate the virtues of the h-index as a metric that measures research output, Hirsch calculated the h-index of Nobel laureates in physics over a period of 20 years and of newly elected members to the National Academy of Sciences in physics and astronomy in 2005. Both these groups comprised individuals with high h-indices.

The h-index, however, has its drawbacks. The index ignores the actual number of citations garnered by the top h papers of a researcher. It is possible that a researcher whose ten best papers have been cited 500 times each and another whose ten best have been cited only 20 times each have the same h-index. Hirsch himself notes that while a high h-index is consistent with high achievement, a low h-index does not imply poor achievement. As the Wikipedia entry on h-index points out, had Einstein died in 1906 (1905 is called Einstein's *Annus Mirabilis*, the year in which he published four seminal papers), he would have a very low h-index even though he would still have been regarded as a brilliant physicist[3]. More rigorous critiques of the h-index can be found in references 7 and 8.

One major limitation with existing metrics for ranking individuals (including the h-index) is the lack of apportioning of credit among various authors in a multi-author paper. The metrics described above give equal credit to all authors, whereas, in practice, this is not the case. While the h-index can be computed for individuals working in any field (some fields like biology permit a higher h-index than others, which is alright as long as cross-field comparisons are not made), it is not obvious whether it is possible to find a solution to the credit apportioning issue that works

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across multiple fields with differing conventions for co-authorship.

The use of citation-based yardsticks to describe individual achievement must be done with great caution. The story of Gregor Johann Mendel is a poignant reminder of the pitfalls of using such yardsticks. Mendel's seminal work on the inheritance of traits in pea plants was published in 1866 in *Proceedings of the Natural History Society of Brunn*[10]. That work remained in obscurity (just three citations in the first 35 years since publication) until it was rediscovered in the early part of the 20th century. Using the above metrics, Mendel would not have been considered an influential researcher. The fact is that his work is part of every textbook on genetics and is hailed as the harbinger of modern genetics. While Mendel's story might be an exception, one that is unlikely to repeat with the availability of comprehensive online literature databases with powerful search facilities, it is worth emphasizing that citation-based metrics suffer from an even more fundamental flaw, viz., they ignore other aspects of academic life such as mentoring, teaching, and "generosity with ideas, skills, and time"[7]. Is it really prudent to "reduce a lifetime's work" to a single number? ⊙

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tion for Susan Lindquist, who became my close friend and colleague as we struggled through the ranks of professorship for twenty years at University of Chicago.

Hironori Funabiki (HF): I admire my two former supervisors, Mitsuhiro Yanagida and Andrew Murray. Yanagida is like a strict traditional Japanese father, who has been a role model both scientifically and personally. His strong opinions always helped me clarify complicated issues, and probably he is one of the most self-disciplined scientists with a great sense of humor. Murray is an amazing collector of knowledge, which is well organized in his brain to create novel ideas all the time. I am also a fan of an anonymous scientist, Mole, who has been writing insightful essays about scientific papers in *Journal of Cell Science*.

Anonymous1 (Anon.1): Rod McKinnon. He identified a really important scientific problem, realized that it took a different approach from what he was doing, abandoned his safe and successful ongoing work, and committed himself to solving the important problem no matter what it took. And succeeded.

David Solecki (DS): I would select, as a group, the trailblazers that created with limited tools, shrewd observation, and great imagination many of the fields that we study today. For instance, many of the founding tenets of developmental neurobiology, my field, were postulated by Santiago Ramón y Cajal during the 1880-90s using only Golgi stained tissues. Many of his theories, such as those concerning axon guidance and neuronal migration, are still the subject of active and cutting-edge investigations today.

Joseph Dougherty (JD): Darwin. He looked at the same natural world as everyone else, but he looked at it in such a way that he was able to infer general principles that no one had noticed before. He was also able to communicate his ideas with such clarity and such a body of evidence as to change how life itself was understood.

Megan King (MK): I see Tom Pollard as a personal role model for how to approach cell biology. Tom effectively uses defined, quantitative assays, but always addresses biological relevance by returning to the intact cell to bridge the *in vitro/in vivo* divide. Although I am irrevocably drawn to cell biology, my training is really in biochemistry and biophysics, so this approach appeals greatly to me.

Huidong Wang (HW): Marie Curie for her tremendous achievement both in physics and chemistry, for her advanced thinking beyond her time as a woman, and for her ability to inspire many young scientists.

Anon.2: Gary Struhl epitomizes what I think a scientist should be. Despite being a full professor, he still works on his own projects at the bench, and designs new ways to test and substantiate his basic hypotheses. If wrong, he alters his hypothesis without ever being married to his ideas. Mendel and Morgan also personified great scientists that tinkered with biology. But Peter Mitchell, who won the 1978 Nobel Prize for the chemiosmotic theory, caught my attention back then from the fact that he came up with the idea by reading the literature, a habit severely lacking in scientists today.

Anon.3: I was a big fan of James Schwartz back when his series of elegant papers on long-term potentiation, published in the late 90s, sparked my interest in molecular neuroscience. I also admire John Sulston who painstakingly mapped out the fate of every cell in *C. elegans* from embryo to adulthood with nothing but a microscope (and a graduate student).

Jaclyn Novatt (JN): Anita B. Roberts. She worked at National Cancer Institute and studied TGF-beta signaling. It was when she came to accept an award from the FASEB in 2005 that she concluded her engrossing talk with a photo of her children and grandchildren, and a heartfelt statement about how much they all mean to her. She exemplifies a woman scientist who has combined success in science with a happy family.

Omar Ahmad (OA): The economist Mohammad Yunus, who won the Nobel Peace Prize in 2006. His ground-breaking research led him to found the Grameen Bank, an innovative financial institution that by offering loans to the landless poor has improved the living standards of millions of people in Bangladesh.

***NS:* What is your definition of a "good scientist?" How would you evaluate scientific quality of a given individual?**

Cori Bargmann (CB): A good scientist combines imagination with rigorous experiments. Sounds easier than it is.

EF: A good scientist has the ability to ask

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an important question, design well-controlled experiments to address the question in multiple ways, while knowing how to interpret the experiments in the most interesting ways and yet without going beyond the boundaries of what the data justify. A good scientist also has the ability to effectively communicate his/her results, orally and in writing to other scientists, would-be scientists, and non-scientists. Finally, a good scientist shares ideas and reagents openly with the scientific community and mentors his/her lab members throughout their training.

MK: In order to define a "good scientist," we need to acknowledge that there are different ways of "doing" science, and as an endeavor, we need all types to be successful. Particularly, hypothesis-driven science is overemphasized (although it is the type of science I enjoy most). We also need scientists who use unbiased approaches, such as carefully designed genetic screens, which often facilitate the greatest (often unanticipated) leaps in understanding. We also need scientists who are more like engineers in the sense that they focus on developing new technologies and assays that we all need, but most of us are not capable of inventing. But at its simplest, good scientists are emotional and enthusiastic about their work until it is time to analyze the data, at which point they become objective and critical.

OA: A good scientist, to paraphrase Aldous Huxley, is someone who has discovered something more interesting than sex. By this measure, it's pretty damn hard to find a good scientist.

NS: **Do you have any opinions on the emphasis placed on publications in top journals and citation indices in evaluating the performance of a scientist?**

CB: In the short term, a high-profile journal is more impressive to those outside the field, and brings the work to a larger audience. In the longer term, the quality and importance of the work transcend the journal. In my field, the most important papers for which Sydney Brenner and John Sulston won the Nobel Prize were one paper in *Genetics* and two papers in *Developmental Biology*.

EF: In utopia, what is relevant in evaluating performance is spending a substantial amount of time and effort to read a scientist's work thoroughly, read the related work in the field carefully, ponder the relative importance of the scientist's work in the context of the field, contact others within the broader field to obtain their opinions, and discuss the merits of the case. In utopia, there is some merit in a candidate's ability to publish in "top" journals, since better journals should have a more rigorous review process and higher standards with respect to the quality of the data and the ability of scientists to articulate the importance of their work to others. I think it is better to aspire to what should be and work harder at making the system better.

HF: If you choose science for occupation, this is the game you have to play. It is not different from the race of restaurateurs in trying to get listings in Zagat survey or Michelin. It is a good practice to think why your work should be published in top journals and why your paper should be cited in future. It is, however, critical for scientists to control the quality of papers published in the journals as it is easy for non-experts to use these factors to form judgments.

> "A good scientist... is someone who has discovered something more interesting than sex."

JD: It is somewhat artificial. We all know of papers in the highest journals that later came to be seen as faulty, as well as strong papers in lower journals that changed the direction of entire fields. However, as long as citation indices are seen as only one more piece of data in an evaluation, I think they are alright. I cannot see another practical alternative.

NS: **If there was one thing you could change about the current practice of science, what would that be?**

DS: I would like to see changes in peer review. I know that all endeavors involving people are going to include some measure of politics, but it seems to me that peer review is the most subjective aspect of a process where quantitation and reproducibility are highly valued.

JD: I think the review of manuscripts and grants should be double-blind as much as possible so that the merit of the proposal or the paper is first judged on its content, and then on its authorship.

MK: I have an inherent fear of cronyism. While I recognize that science is carried out among a group of peers with whom you have relationships (good, bad, or indifferent), I wish that one could be judged on one's talents and accomplishments alone. I have a hunch that many female scientists feel similarly, because cronyism is something that rarely benefits women in science.

Anon.2: Unfortunately, we are not doing science any more, we are doing science business (like show business). It is about money, power, fame, and last of all science. I think the Internet will one day solve this basic problem in science. Where this manifests itself most is in the peer review process for publishing.

Anon.3: I would like to see less paranoia and more sharing of data and information, although I realize these problems arise as a consequence of competition and a struggle for limited resources.

JN: I would change the way funding is distributed. The fact that you need results to be given the money, which you need to get results, is incredibly frustrating. I wish there were more money available to researchers, or less expensive ways of doing science!

Martin Kampmann: Eliminate the politics, which seem to absorb so much valuable time and energy of postdocs and senior scientists. Unfortunately, too many of them seem to be into it.

OA: Current research funding policies in the US promote the training of new scientists at a rate far in excess of that at which academic positions are created. By the law of supply and demand, compensation for scientists has fallen accordingly. It is principally young scientists who bear the brunt of this fall, which has taken the form of diminished job security for researchers just starting out in their careers. These facts suggest two policies to help distribute resources and opportunities more equitably and efficiently within the scientific community: 1) curtailing the training of new scientists so that supply better matches demand, 2) eliminating the tenure system. Young people entering science should be better educated about their prospects for a career in academia and other job opportunities outside of academia for which their scientific training is either directly useful or is valuable as a signal of quality to prospective employers. ⊙

New York State of Mind

This month,* Natural Selections *features Doruk Golcu, Graduate Fellow in the Gilbert Laboratory
Country of Origin: Turkey

1. How long have you been living in New York? Three and a half years.
2. Where do you live? Graduate Students Residence at RU.
3. Which is your favorite neighborhood? Union Square.
4. What do you think is the most overrated thing in the city? And underrated? The most overrated is the arts. There is a lot of art in the city, but most of it is low quality and/or pretentious. I like how many bookstores there are, which is not mentioned often anywhere.
5. What do you miss most when you are out of town? The variety of food that you can find here.
6. If you could change one thing about NYC, what would that be? Make New Yorkers realize that they are not the center of the universe.
7. Describe a perfect weekend in NYC. I am a homebody, so weekends when I don't have to do anything much are my favorites. I usually spend most of the day at home—reading, watching movies, or surfing the Internet (yes, I am boring). Having bagels at Bagelworks (66th Street and First Avenue) is part of my weekend ritual. Those weekends when I do feel like leaving home, my favorite destination is the American Museum of Natural History. In the evenings, I go to the movies, or dancing.
8. What is the most memorable experience you have had in NYC? I met my wife here, so I think that would be it. Plus, she would kill me if I said anything else.
9. If you could live anywhere else, where would that be? I lived in big cities most of my life, so if I could choose, I would like to live somewhere quieter and with more nature.
10. Do you think of yourself as a New Yorker? Why? I don't think I am really a New Yorker. I still feel more at home in Istanbul. I like New York, but I am not sure I would like to stay. ⊙

Poster Survey

Manuel Castellano-Muñoz

During two consecutive Fridays in March, the Rockefeller community attended the annual Postdoctoral/Research Associate Poster Competition. This is the second year of this contest organized by the Postdoctoral Association. With this competition, the PDA's intention was to celebrate postdoctoral work on campus and give awards to outstanding work done by RU postdocs or RAs during their time in the university. The competition coincided with the graduate student recruitment weekends. The poster sessions were used as a ready-made format for judging and giving awards for postdoc/RA work, and encouraging labs to exhibit their research.

Among the twenty-two posters participating in the contest this year, five prizes were awarded: 1st place, $1000; 2nd place, $500; 3rd place, $300; and 4th and 5th place, $100 each. These prizes were sponsored by the PDA. In addition, the 1st and 2nd place winners will be invited to give a thirty-minute seminar on their work. Here are the winners:

1st Place: Valerie Horsley, Fuchs Lab, "Blimp1 Regulates Cellular Contribution to the Sebaceous Gland."

2nd Place: Andreas Keller, Vosshall Lab, "Genetic Basis of Specific Anosmia."

3rd Place: Frank Neumann, Nurse Lab, "Nuclear Size Control in Fission Yeast."

4th Place: Matteo Ruggiu, R. Darnell Lab, "Alternative Splicing and the Synapse: The Splicing Factor Nova Regulates the Formation of the Neuromuscular Junction."

5th Place (tie): Jennifer Mehren, Vosshall Lab, "Behavioral and Anatomical Analysis of a Targeted Mutation in a Pheromone Receptor in *Drosophila melanogaster,*" and Lisa Postow, Funabiki Lab, "Damage-dependent Ubiquitination and Degradation of Ku80."

We carried out a survey among the postdoc and faculty judges for the criteria used to decide the top posters. Interestingly, although some of the judges gave similar answers, there did not seem to be unanimous standards. These were the different criteria we collected:

- Importance of the scientific message
- Originality of the scientific message
- Impact of the work
- Appeal of the scientific question
- Difficulty of answering the scientific question
- Scientific quality
- Beauty of the story
- Amount of work accomplished
- Structure (logical transition of the different parts)
- Clarity of the poster
- Simplicity of the poster
- Clear summaries and main conclusions
- Quality of the figures
- Nice figures versus too many written words
- Ability of the author to explain the work in simple words
- Ability of the author to answer different questions
- Brevity of the explanation

Some of the judges were more focused on the scientific message (no matter the amount of work carried out), but others pointed out the importance of nice and clear presentation. Many of them insisted on the significance of the oral explanation by the author.

However, not all the criteria were solely scientific. We obtained a large variety of answers from the judges, including factors such as "If it was not too crowded in front of the poster," "If I knew the person," "If I wanted to know the person," and "If the girl was pretty and single."

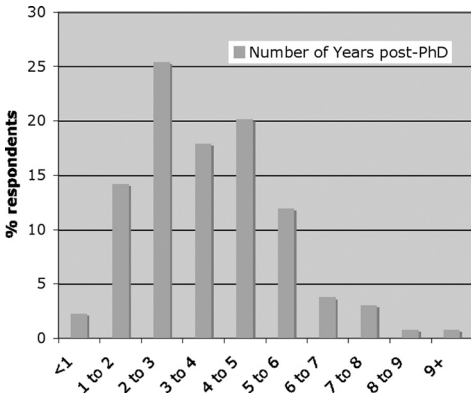
The poster competition gives us a great opportunity to showcase RU research, and also serves to increase interest for the recruitment of new graduate student for our labs. The postdoctoral/RA community in Rockefeller is encouraged to participate in this competition next year. ⊙

Another Postdoc Burden

Patrick Lusk and Nadim Shohdy

In the recent edition of *From the Desk of the NIH Director*, Elias A. Zerhouni outlined his concerns regarding future opportunities for young investigators. Perhaps the most striking statistic he referenced was the dramatic increase in the length of time it is taking for postdocs to secure their first faculty position. From 1980 to 2004, the average age at the time of academic appointment rose from 34 to 38.5. Consistent with this increase, the average age

Distribution of post-Ph.D. duration among RU postdocs/RAs



of investigators receiving their first RO1 grant rose from 37 to 42. These figures have many implications regarding the career paths facing postdocs, one of which is the increasing length of time that postdocs are unable to financially support their future retirements.

While there is no doubt that RU postdocs tend to fare much better than average when searching for a faculty position, figures gathered by our administration suggest that the average number of years that individuals spend at RU as postdoctoral associates/fellows has risen from 2.2 years in 1985 to 3.2 years in 2006. It is important to note, however, that these numbers do not consider postdocs that have been previously employed in other postdoc (or other) positions, nor does it include the additional years spent after promotion to the RA level. A starker picture has emerged from the recent "retirement" survey conducted by the Postdoctoral Association. The current postdoctoral/RA body at RU has an average age of 33 and is, on average, in their third year of their post-Ph.D. training. The distribution of post-Ph.D. years is shown in the accompanying chart and illustrates an aging postdoc population, with significant percentages of postdocs in their fifth or sixth years and a small fraction reaching nine or more years.

What these numbers represent to the PDA is an ever increasing amount of time where postdocs are not able to receive full retirement benefits from their employer. Currently, all RU personnel are permitted to contribute to the tax-sheltered retirement plan (60% of respondents do not make any contributions to any retirement plan). However, RU makes contributions for all employees employed for two years, with the exception of postdocs. Postdocs only become eligible for this important benefit upon reaching RA status. The one exception is postdocs employed by the Howard Hughes Medical Institute, which contributes 5% of their income to a retirement plan (HHMI postdoc salary scales are lower than current RU standards). The PDA feels, in light of current realities, that the lack of institutional investment in the future of postdocs is a problem that should be ameliorated. The erosion of fixed pensions (in both industry and academia) coupled with the precarious position of Social Security leaves tax-sheltered annuity plans (401(k) and 403(b)) the only viable options to financial security upon retirement. However, for such plans to be effective, contributions must be made early in one's career. If one considers that most postdocs will not receive such retirement benefits until they have a permanent position (i.e. late 30s), this translates into a substantial loss of savings. For example, initiating contributions to retirement accounts at age 25 would lead to at least three times more funds (to be collected at age 65) compared to initiating an equal contribution at age 37! In reality though, the difference would be much higher since our simple calculation does not take into account increases in salary and retirement contributions over time.

The rationale behind the ineligibility of postdocs to access the retirement benefit is largely a result of a traditional classification of postdocs as temporary employees; it has therefore not been a priority for institutions to invest in individuals that do not stay longer than one to two years. Further, postdocs are often classified as students or trainees. Since it is clear from our survey that most postdocs currently at RU will spend at least three years in a postdoc position (most expect to be postdoc for five years), these classifications are anachronistic and need to evolve to better reflect the reality of the postdoctoral experience today. Some institutions have begun to recognize this reality and have demonstrated courage in formulating diverse but equitable methods of contributing to the financial future of their postdocs. For example, some institutions like Emory University have chosen to match postdoc contributions to retirement plans while others such as Princeton University have provided postdocs with an across-the-board supplement specifically in lieu of a retirement plan (for more details and other institutional policies see www.rockefeller.edu/pda). Finally, both the National Academy of Sciences and the National Postdoctoral Association have declared the need for plans to improve retirement plans for the postdoc community.

RU has a rich history in promoting the rights of postdocs; our President and senior levels of the administration have indicated, both on and off the record, a strong support to improve the postdoc experience. The administration is currently surveying other institutions to develop the best strategy for addressing these concerns. We strongly urge all postdocs and RAs to share any questions, comments, or suggestions on this critical subject by contacting your PDA representatives (pda@rockefeller.edu). The results of the retirement survey in their entirety can be found at www.rockefeller.edu/pda. ⊙

Academia Nuts

cartoon by Sean Taverna

"But we won't learn anything unless we try it again with the proper controls…"

Launching the Science-Film Initiative

Rockefeller scientists make their own science(-fiction) films

Alexis Gambis

drawn by Alexis Gambis

Science and film have always gone hand in hand. Since the beginning of moving images with Mélies' *Voyage à la Lune* and Fritz Lang's *Metropolis*, film has turned to science for inspiration. The public has always been fascinated by adventures, where science becomes science fiction, with futuristic, imaginary, and speculative turns and twists. With Einstein's theory of relativity or the birth of intelligent machines, the big screen brought us to places where time travel is possible and human-designed robots invade the planet. The film industry has profited from science to generate visually exciting pictures. Take the concept of DNA and mutations, bring in a few elements of drama, terror, and fantasy, and sprinkle a few special effects, and you've got a winning ticket: the story of a genetically inferior man who assumes the identity of a superior one to pursue his lifelong dream of space travel (*Gattaca*, 2001).

What about the other side of the deal? How has the image of science been influenced by its appearances on the big screen? One could argue, and truthfully so, that film with its strong visual and "sexy" storytelling has served as an educational tool making science more accessible to the public. It has also served to increase the dialogue between the scientists and the public. And to some extent, it has also instigated curiosity and interest in scientific concepts and discoveries. I will be the first to admit that 80s science-fiction flicks on TV brought the aspiring scientist out of me. Even today, I get flashbacks of the plutonium capsules in *Back to the Future*'s Dolerean time travel machine when reaching for radioactive ^{32}P stored in the lead box. I also occasionally reminisce about the transforming machine in the *The Fly* when I find myself in the fly room staring at fruit flies under the microscope. Film has also been helpful in raising the ethical boundaries and philosophical undertones of science. In *Gattaca*, we are placed in a disturbing and terrifying not-so-implausible future where humans are discriminated according to their genetic makeup and receive genetic enhancements at birth to favor their success. In *2001: A Space Odyssey*, the robot Hal 9000 turns against its own creator and takes control of the space ship. With these films, we bump against existential questions such as "What makes us human?"

Unfortunately, there is a darker side to the marriage between science and film. Extrapolated science in films far too often does not ground itself on credible science leaving the world of reality to enter the realms of the ludicrous. Film also often draws overused and inaccurate stereotypes of scientists. Finally, it seems that it is often the dark and powerful side of science, or science and technology gone awry, that appeals to filmmakers. Hence, with millions of people rushing to the big screen, film has the potential to transpire misconceptions, damaging stereotypes, and outright falsehoods about science and scientists. *Godsend*, a film about an eight-year-old boy who is brought back to life by cloning, is a typical example. With a story not founded on credible genetics, the film becomes manipulative and incredibly bogus. What we are left with is a freakish film that takes an issue of topical interest from the headlines and grafts a wildly histrionic reaction to it. Not surprisingly, after such films, the ill-informed public hysteria wants cloning, genetic engineering, and the quite beneficial stem cell research banned on the premise that it is killing unborn souls or that it might produce races of three-legged mutants. In the public eye, the everyday scientist suddenly becomes a delirious, mad, and "unethical" scientist who mischievously wants to abolish the human race using pipette tips and stem cells.

To prevent the exploitation of science in film, an increasing number of film schools and festivals have an objective to influence the next generation to create more realistic science-based stories and to challenge existing stereotypes and biases about scientists through visual media. The non-profit institution, the Alfred P. Sloan Foundation has been at the forefront of these initiatives; it has fueled the means to increase public understanding of science to a wide non-specialist audience through different forms of communication, notably film. There have also been open forums and Internet Web sites where filmmakers and scientists have joined efforts to ultimately produce together compelling material in a friendly medium. Being an aficionado of filmmaking and with the recent invitation from Lukasz Kowalik to be part of the Rockefeller Film Series, I have decided to begin the Science-Film initiative on campus. The objective is to have scientists on campus make short digital films on science-related topics, which will be shown to the entire RU community. These films could be experimental shorts, documentaries, narratives, or others genres of choice. They could also be a collaborative enterprise. As these shorties will be shown before our feature film screenings, the only constraint is that they remain less than ten minutes in length. We also plan to show these short videos on a special Monday screening and will ask attendees to vote for their favorites in different categories. Access to equipment both for the making and for post-production of these shorts is a concern, but no worries—not much is needed to crank out a short film. And maybe in the near future, we will get funding to buy film equipment and software. But, for now, you will need a digital camcorder, a computer, (a microphone if using synchronized sound), and an editing software such as Final Cut Pro and voilà—you are ready to rumble. The goal is to have you begin making your films as soon as possible. When your short films are completed, you should burn them to DVDs and drop them into my box (#252). Feel free to contact me at films@rockefeller.edu (or agambis@rockefeller.edu) if you have any questions. I will be sending an e-mail out shortly announcing the Science-Film initiative. ⊙

RU Film Series

Alexis Gambis and Lukasz Kowalik

This month, again, two delicious offerings: a French cult film and a feature by a local NYC Filipino team. Enjoy!

In *Delicatessen*, we are transposed to the post-apocalyptic future of desolation where food is in short supply, grain is used as currency, and the starving locals are capable of anything for a slab of fresh meat. The story revolves around a bizarre but eclectic group of neighbors in an apartment building located right above a delicatessen, who pay their butcher, Jean-Claude Dreyfuss, for food and board. However, in this ill-lit bunker surrounded by wasteland and run by a devilish butcher, more occurs than meets the eye. Dreyfuss supplies a rare commodity—fresh "human" meat—to his residents by murdering workers that he hires to do odd jobs. Louison, a grieving ex-clown, is the new victim in town. He is offered a job and a place to stay not knowing what his fate is going to be. Will the love affair with Marie-Laure Dougnac, Dreyfuss' myopic daughter, save him from the butcher's meat blade? Or will the unforgiving thirst for human flesh prevail?

Delicatessen welds comedy and magic into a bizarre, grotesque fantasy of an oddball dystopian future. Jeunet and Caro constantly bring us into unfamiliar and unpredictable terrains where the audience is struck by the normalcy of the sheer weirdness of it all. Occasionally, the plot stops to watch a scene spiral off in tangent, such as the everyday activities of the underground vegetarian terrorist organization, the Troglodists, or two boys spying an old man breeding escargots in his flooded apartment. The brilliance of *Delicatessen* not only comes from the saturated imagery but also from the jumble of sounds, which fill in the space. One cannot help but fell eerie when the creaking bed vibrates through the building, the violin screeches from upstairs, and the staircase cracks in the obscurity of the night. This tale of small town cannibalism and star-crossed love is a true masterpiece, which cannot be missed.

Rigodon, the next film, was spotted by us during the Asian American Film Festival. We talked to the directors and asked if we can bring the film to Rockefeller—and they agreed. In English and Tagalog, it intertwines stories of three Filipino immigrants—a poet, a boxer, and a US veteran's wife—and it takes place nowhere else but in New York City. The film explores their uncertain status in the society, their longings, visions of the loved ones, and dreams. Some sequences, like the one of wife's prayer, are certainly hard to forget. The film is a little raw, shot digitally, but the director's grip on his chosen esthetics and story is firm. Of course, the INS makes an appearance. With the recent discussion on the role and status of immigrants in American society, this is the movie to watch and talk about.

4/9 8 p.m. *Delicatessen* (1991), directed by Marc Caro and Jean-Pierre Jeunet

4/26 8 p.m. *Rigodon* (2005), directed by Sari Raissa Lluch Dalena and Keith Sicat

The screenings are free of charge. All members of the Tri-Institutional community are warmly invited, along with their guests. ⊙

In Our Good Books

Some reading suggestions have been kindly provided by staff members of the downtown bookstore McNally Robinson.

An Infinity of Little Hours, by Nancy Klein Maguire
Carthusian monks are the most contemplative and solitary in the Catholic church, and their lives until 1965 were indiscernible from their founders' in 1084. This book captures the moment before Vatican II enforced changes to the order, in a British Charterhouse where men of varying personalities and strengths live every moment of every night and day in a carefully structured rhythm designed to strengthen their relationship with God. A fascinating book, and truly an escape from New York.

Selected Poems of Paul Celan, by Paul Celan
The single greatest poet to emerge from postwar Germany's "culture of silence," Celan is himself a master of framing and the blank page. More than simple elision, however, Celan's silences are the still pool of memory upon which his words, all foliage and metonymy, are buoyed up. A wondrous voice.

Him Her Him Again, The End Of Him, by Patricia Marx
I know the title is terrible, especially with the dagger drawn through it. I never laugh out loud when I read a novel, and I nearly laughed out loud several times when reading this very funny book. If you are tired of reading about nuclear winters, infertility, global warming, personality disorders, genocides, governmental corruption, and the murderous xenophobia of the current Republican administration, this book is for you. And if you ever felt masochistic about hanging on to a lover who treated you like cannon fodder, Patricia Marx's protagonist will make you feel that much better about yourself. When was the last time you read a book where the nicest characters were the long-suffering parents? What a wonder. What a relief. What a joy.

The Curtain, by Milan Kundera
Kundera is dazzling on the subject of fiction. If you are at all interested in the subject, this book will be a treasure. It is Euro-male-centric, no question, but profoundly insightful on Euro-male-centric fiction.

The Mole People, by Jennifer Toth
Truth is so much cooler than fiction. Next time you're at the edge of the subway platform, looking deep into the tunnel for the lights of your train, try to imagine that gaping abyss buzzing with human life. Because it is.

The Lost Painting, by Jonathan Harr
This wonderful book traces the discovery and revelation of the "lost" Caravaggio masterpiece *The Taking of Christ* from its disappearance from the Renaissance Mattei collections to its discovery in a Jesuit monastery in Dublin. Part thriller, part exercise in art restoration, part exposé of the competitive world of art history study, and a thoroughly enjoyable study of the short and wild life of the master of candlelight, this book reads like the wind. Written with journalistic panache and novelistic insight, Harr illuminates the dark corners and dark alleys of Roman history. What fun. ⊙

McNally Robinson independent bookstore is well worth a visit, they have a fantastic selection of books on their shelves. The store is located in NoLIta at 52 Prince Street between Lafayette and Mulberry. Visit them at http://www.mcnallyrobinsonnyc.com/