

The NICHD Connection

August 2014

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How to Make Your Grant Proposal "Sellable"

By Payal Ray, PhD

How do you capture intricate ideas in a straightforward way on paper...and then convince someone to fund those ideas? For fellows struggling to answer this question, the NICHD Office of Education organized a "Writing Winning NIH Grant Proposals" workshop. Dr. John Robertson, a member of Grant Writers Seminar and Workshop, LLC, revealed to workshop participants that the secret to getting your grant funded is to make your research *sellable*—convince your reviewers that the outcome of your study will provide a solution to a *critical need* within the community.

The daylong workshop featured key aspects of a stellar grant application, with a focus on material in the specific aims section, research strategy, significance, innovation, and approach. In particular, Dr. Robertson placed emphasis on the two most important sections of the grant: the specific aims page and the innovation section.

The specific aims page is equivalent to an advertisement for your research; whether the reviewers decide to read the rest of your proposal hinges on the impression you make in this section. You need to pose your question (*critical need*) clearly and propose a *novel solution* to this need to show you have something special to offer. It is imperative that the specific aims page contains everything important about the project, but without a lot of detail. Needless to say, this is the most difficult section to write and must be written **FIRST**.

THE SPECIFIC AIMS PAGE

Dr. Robertson laid out the essentials for a strong specific aims section, listed as follows:

1. Introductory paragraph, including knowns and unknowns (the gap in knowledge)
2. Central hypothesis and rationale
3. Aims (specific aims/goals)
4. Payoff paragraph consisting of expectations and positive impact

In the introductory paragraph, it is best to use a "hook" sentence to generate interest in the proposal. This section should also address what the proposal will

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Letter from the Editor

There are days I agonize over words. Do they say what I intend? Are they eloquent enough? Are my words too...wordy? For a scientist or clinician, how you choose to present your ideas is critical. A well-written proposal can fund an entire lab. A concise explanation can help a patient understand his problem. Or a tangible model might better show the binding site of a protein. If you haven't guessed by now, this month we're focusing on how to communicate information well.

Dr. Payal Ray's recap of the recent proposal writing workshop, found on [page 1](#), captures the dos and don'ts of grant proposal writing. She highlights the most important sections of the proposal and offers writing examples to help you get started. You might have wonderful ideas, but it takes a distinct proposal to get them funded, especially in today's fiscal climate (but that's for another issue).

Sometimes it takes more than writing or pictures to explain a technical concept. If a picture is worth a thousand words, a physical model is worth a million pictures. Three-dimensional printing, the process of layering materials via a printer, allows scientists to create tangible biological entities or even custom lab equipment. On [page 6](#), Erin Fincher writes about the new [NIH 3D Print Exchange](#) and how it has benefited our scientific community.

If a language barrier inhibits your ability to communicate, you might find relief with Mango Languages. Jeffrey Roberson reviews this free-through-OITE tool on [page 8](#). If you try it out, let us know what you think!

Also inside, check out excerpts from the [2014 NICHD Mentors of the Year nominations](#), our first [Three-minute-Talk winners](#) (who won due to their concise communication skills), and [August announcements and events](#).

In the words of Dr. Philip Abelson: "The quiet personal satisfactions of work in the laboratory are important to the individual. Research, however, is just a pleasant hobby unless its results are evaluated and incorporated into the total body of knowledge. Thus it is the communication process which is at the core of the vitality and integrity of science."¹

Your Editor in Chief,
Shana R. Spindler, PhD

Please send questions and comments to Shana.Spindler@gmail.com.

¹ *The roots of scientific integrity*, Editorial in *Science* (29 March 1963) 139: 1257 [DOI: 10.1126/science.139.3561.1257]



How to Make Your Grant Proposal “Sellable” (continued from page 1)

be about and how it relates to the mission of the funding agency, but avoid stating information that is obvious to any reviewer. For example, if your research is cancer-related, do not write “Cancer is the second leading cause of death in the world.” This statement fails to present new information or introduce what the grant proposes.

Dr. Robertson presented two lead sentence examples from a proposal to develop natural products that can be used in wound healing:

The unhelpful lead: Type II diabetes, currently recognized as among the major debilitating disease in the U.S affecting more than 3% of all adults, frequently results in open wounds that are resistant to healing.

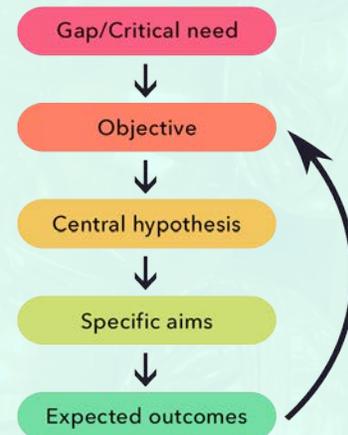
The helpful lead: Reestablishment of the skin’s protective barrier functions through wound healing is known to be significantly compromised in a number of chronic diseases including diabetes, scleroderma, and severe acne.

The remainder of the first paragraph must acquaint reviewers with current work in your field and establish a gap in what’s known. Do not assume reviewers will know why your work is important; clearly define a critical need—the driving force for the proposal.

The second paragraph should present an objective that addresses the critical need identified in the first paragraph and a testable central hypothesis. This paragraph also contains the long-term goals. At this point, check that the objective matches the critical need you identified. The primary purpose of this paragraph is to convince the reviewers that you (and your team) have the *fix* to the *problem* identified in first paragraph.

The third paragraph comprises a logical step-by-step plan to address the critical need. This is commonly known as the specific aims. The best way to accomplish this is to have two to three headline statements that are **conceptual rather than descriptive**. For example, referring to our example regarding natural product development for wound healing:

The workshop provided a helpful flowchart for developing a strong specific aims section:



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How to Make Your Grant Proposal “Sellable” (continued from page 3)

Conceptual aim: “Identify the active component of *G. jasminoides* extracts responsible for wound healing.”

Descriptive aim: “Examine whether the active component in *G. jasminoides* extracts responsible for wound healing is β -carotenoid.”

Both the aims address a *working hypothesis* that the active component will be β -carotenoid, but in the second example, the opening “Examine whether” is indeterminate and seems like a look-and-see objective without a concrete basis. The first example takes into consideration that the active component may be something other than β -carotenoid.

The fourth paragraph serves to highlight the “payoffs” of the study, emphasizing why this would be of value to the funding agency. Begin this paragraph with *expected outcomes* (e.g., We expect to have determined), which must be specific and credible. For K awards, use singular first person pronoun (i.e., “I” instead of “we”). The final statement in this paragraph should be of positive impact, basically, how the outcomes will meet the need and advance the mission of the agency.

THE RESEARCH STRATEGY

The Research Strategy follows the

Specific Aims page and consists of three subsections:

1. Significance
2. Innovation
3. Approach

While the significance and approach subsections may seem easy to develop (after all, that is what we just covered for the specific aims page), Dr. Robertson said the two most common mistakes made by applicants are “insufficient justification for the significance of the proposal” and “including too few details about proposed studies.”

The middle subsection on Innovation follows significance and should be about one-third to one-half of a page. This section is different from the significance section in that significance is a positive effect of the study while innovation refers to a new and substantially different way of answering an NIH-relevant problem.

While writing the innovation section, document the existing strategies, state their limitations, and then use the italicized statement, “The proposed research is innovative, in our opinion, because...” Next, summarize the advancements that may become possible with your innovative new approach.

SELLING YOUR SCIENCE

To get your research funded, you have

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How to Make Your Grant Proposal “Sellable” (continued from page 4)

to win over your reviewers and turn them into your advocates. It should be a breeze for the primary reviewer to present your proposal to the study section because you wrote and organized your proposal well. Also, it helps to spend some time creating a good title—that is the first thing the reviewers will read!

If possible, know your reviewers by looking up the members of the study sections at <http://public.csr.nih.gov>. To make the entire process smooth, always stay in touch with your program officer, who can make helpful suggestions about which study section would be appropriate.

Make sure you start writing your proposal well ahead of the deadlines and recruit friends and colleagues to

read and edit your document. Also, give your collaborators/mentors/co-mentors ample time to critique and offer feedback on your proposal. This will ensure that you have the perfect grant application ready for submission in a timely manner.

More information can be found at: NIH GRANT WRITING TIPS
http://grants.nih.gov/grants/grant_tips.htm

Also visit Dr. Yvette Pittman in the Office of Education, NICHD, to review grant application requirements and time lines for our institute.

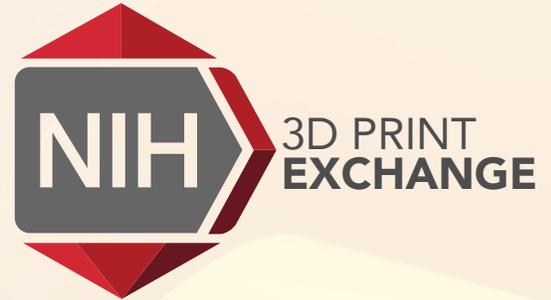
» Reference: Russell, S.W. and Morrison, D.C. The grant application writers' workbook: National Institutes of Health Version

The Arts: 3D Printing, More Than a Pretty Paperweight By Erin Fincher

If you like to keep up with the latest technology news, you probably know something about three-dimensional (3D) printing. For those unfamiliar with the term, 3D printing is the process of making a physical object from a three-dimensional digital model by building up layer upon layer of material. Three-dimensional printing is one of the latest trends in manufacturing; some claim it will revolutionize the way we make, create, and buy goods.

Innovators around the world are revealing new applications of this “additive manufacturing” technology. Three-dimensional printers have been used to make jewelry, build a house, and even make a pizza. But what can 3D printing offer to the scientific community at the NICHD and how can fellows access it?

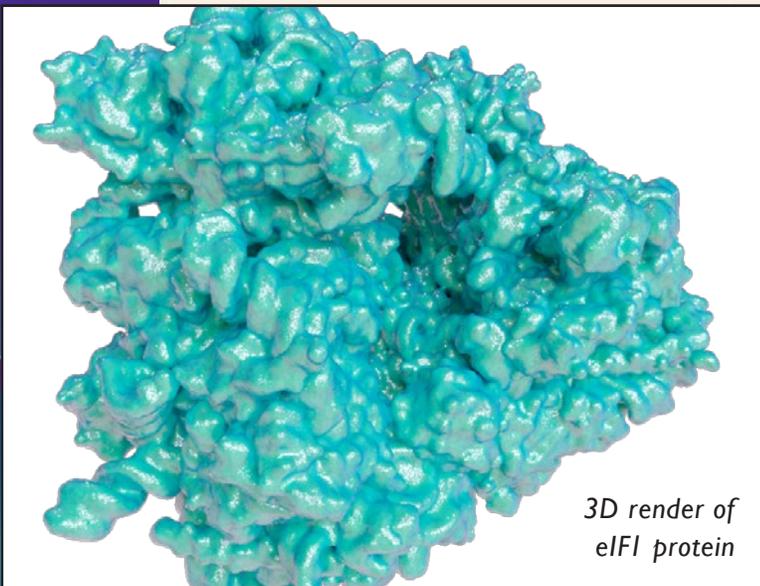
The NIH 3D Print Exchange (3DPX), a collaborative project among several NIH



institutes, is an invaluable tool for utilizing 3D printing technology in scientific research. In one simple website, 3DPX allows researchers to share and access biomedical three-dimensional files ready for printing. The 3DPX website also hosts a novel, web-based tool that allows users to create high-quality 3D printable models in minutes, a process that would normally take hours.

Darrell Hurt, 3DPX project lead and computational biologist at the National Institute of Allergy and Infectious Diseases (NIAID), has been producing 3D printed protein structures for years. “Every time I take one of these things and give them to a researcher, they learn something from it,” Darrell says. “And the researcher who’s been using a computer model of this for fifteen years learns something as soon as they put their hands on the real tangible model. Imagine how impactful it might be for someone who’s just starting out.”

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3D render of
eIF1 protein

The Arts: 3D Printing (continued from page 6)

Custom 3D printed labware has the potential to save labs time and money. In Dr. Burgess's lab here at the NICHD, 3D printing has been used to create custom parts to make zebrafish research easier and more efficient. Using 3D printing, Dr. Tohei Yokogawa, a postdoctoral fellow in the Burgess lab, generated several new water flow chambers to monitor fish behavior in variable environments. "[The] biggest benefit of 3D printing for me is its speed of making prototypes," Dr. Yokogawa said. "The whole process of going from an idea in your mind to design in 3D software to 3D printing to testing the prototype is unbelievably fast compared to factory orders."

Three-dimensional printing also has applications in a clinical setting. Across the street at Walter Reed National Military Medical Center, Dr. Gerry Grant runs the 3D Medical Applications Center (3DMAC). Every day, the 3D printers at 3DMAC produce medical models for surgical planning, prostheses, and even custom implants. Three-dimensional printed models can be so much more than just trinkets and paperweights.

To learn more about how 3D printing may benefit you and your research, visit the NIH 3D Print Exchange website (<http://3dprint.nih.gov>). There you can find a collection of bioscientifically relevant 3D models available to download and print, share your own models, or create a model from your own data.



3D print of
Golgi structure

Mango Languages: A Tool for Practicing English and Other Languages

By Jeffrey Roberson

¿Puedes hablar español? Or is it “puede?” If you have plans to travel to a country and you do not speak their language, then Mango Languages was made for you! With the Office of Intramural Training and Education’s new subscription, you can learn travel-related vocabulary and phrases for a host of different languages through this conversation-based program. For our international fellows, Mango Languages could prove to be an invaluable resource for getting some quick tips about the English language and American culture.

A recently heightened emphasis on the use of technology for learning a second language has led to the development of numerous different programs that all have unique aims. According to The American Council on the Teaching of Foreign Language, the goals of a comprehensive language program are cultural and communicative competency. Adopting a conversation-based approach, Mango Languages exposes you to phrases and signs you would see in mass transit stations, restaurants,

and for accommodations.

For those of us who have taken formal second language courses, you will notice that the Mango Language program avoids explicit grammar education. Gone are the days of conjugation tables and rote memorization. Instead, the Mango Languages approach assumes that you will grasp the necessary grammar for your trip through the mock conversations. While you may not be able to use complex verb tenses after a few weeks, Mango Languages will allow you to express basic desires and interests.

A common criticism of online language learning programs is that they do not provide the cultural experience and exposure that traditional courses can provide. In order to account for this shortcoming, Mango Languages has “Cultural Notes” that periodically appear throughout your lessons. These notes will provide you information on topics such as how to dress (long pants versus shorts, shoulders covered versus uncovered) as well as tipping customs in restaurants and

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Mango Languages

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taxicabs. Although this does not provide direct exposure, it can at least help you avoid being the only person wearing shorts and sandals in all of Buenos Aires!

The flexibility of online learning is extremely attractive for busy professionals. The ability to decide when and where you want to study allows you to create an individualized learning process. Nevertheless, learning a language cannot be done in one day. Instead, it requires dedication and constant practice. While Mango Languages does track your progress, there are, of course, no repercussions for a lack of practice that would typically occur in a traditional classroom. Dedicate at least two hours per week to your studies, and you will acquire enough English to understand in which cities you should use the words “subway” and “metro.” Yes, there is a distinction!

In order to begin your exploration into a different language and culture, register for a new account through this link: <http://org.mangolanguages.com/nih/login?u=870054>. To benefit from the OITE’s subscription, you must sign up for an account from an NIH computer. Once you have created an account, consider downloading the Mango Languages smart phone application so that you can practice anywhere and everywhere!

Three-minute Talk Winners Announced

NICHD graduate student and postdoctoral fellows worked over the last several months to condense thousands of hours of research into three short minutes. Their efforts were part of the Three-minute Talk (TmT) competition, a new intramural contest that encourages NICHD fellows to share the significance of their research, develop concise communication skills, and highlight the scope of research in the intramural program.

After three rounds of communication training and judging and video recording, a panel of outside judges selected first- and second-place winners from the finalists' three-minute clips. The intramural community also participated in the scoring by viewing the videos online and voting for the "People's Choice" award.

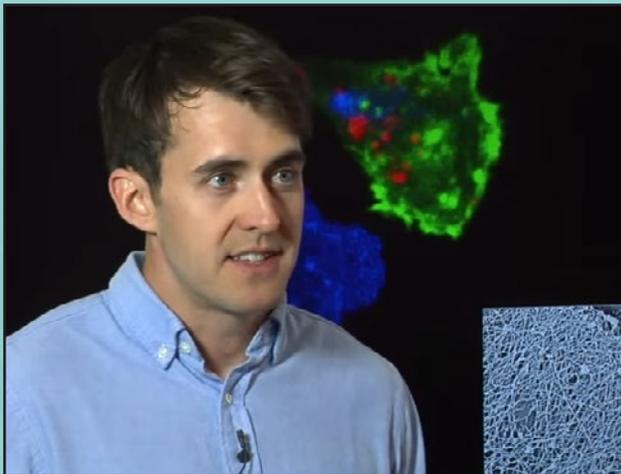
Drum roll please...

The 2014 TmT winners are:

- » **Alex Ritter** (Lippincott-Schwartz lab), 1st place
- » **Eva Szarek, Ph.D.** (Stratakis lab), 2nd place
- » **Monica Gupta, Ph.D.** (Ozato lab), people's choice



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Alex Ritter, 1st place winner

Three-minute Talk Winners Announced

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Congratulations to all of the 2014 finalists:

- » **Thomas Miller, Ph.D.** (Shi), Finalist
- » **Celine Cluzeau, Ph.D.** (Porter), Finalist
- » **Saravana Murthy, Ph.D.** (Loh), Finalist
- » **Sudhir Rai, Ph.D.** (Levin), Finalist
- » **Prasanna Satpute, Ph.D.** (Lippincott-Schwartz), Finalist
- » **Nader Shahni Karamzadeh** (Gandjbakhche), Finalist

The winning videos will soon be accessible on the intramural website and presented during scientific meetings at the NICHD. In addition, the 2014 TmT winners can continue their professional growth with an award to participate in a local career or professional development activity.



Click the link below to view all of the TmT finalist videos:

<https://science.nichd.nih.gov/confluence/display/tmt/People's+Choice>

Dr. Szarek's photo removed, 8/25/14



Monica Gupta, people's choice

NICHD Mentors of the Year for 2014

The NICHD Mentor of the Year Award is an opportunity to recognize individuals whose mentoring has made a difference in someone's life at NIH. The two mentoring award categories are fellows and investigators. Nominations were invited from all trainee groups in NICHD, and each nominator had to write a statement, on which the selection committee based their decisions. The selection committee included NICHD clinical and postdoctoral fellows, and postbac fellows.

For the fellow mentoring award, there were two finalists:

- » Dr. Sarine Markossian, nominated by summer student Kunal Khurana
- » Dr. Elias Leiva-Salcedo, nominated by graduate student Katrina Furth

And the winner of this year's fellow Mentor of the Year award is Dr. Elias Leiva-Salcedo (picture at right).

Excerpts from Dr. Leiva-Salcedo's nomination:

"Dr. Leiva-Salcedo consistently shows patience and generosity with his time and resources while teaching me how to collect high-quality, reproducible data and develop concise, testable hypotheses. I have learned many life lessons regarding scientific integrity and perseverance in the midst of difficulty. The mentorship provided was particularly noteworthy as Dr. Leiva-Salcedo committed countless hours to my training as an electrophysiologist and has always inspired me to achieve my full potential."



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NICHD Mentors of the Year for 2014 (continued from page 12)

For the investigator award, there were three finalists:

- » Dr. Mark Stopfer, nominated by postdoc fellow Nitin Gupta
- » Dr. Brant Weinstein, nominated by two postdoc fellows, Amber Stratman and Matthew Butler
- » Dr. Tonja Nansel, nominated by two postbac fellows, Dexter Thomas and Benjamin Gee

The winner of this year's investigator Mentor of the Year award is Dr. Brant Weinstein.

Excerpts from Dr. Weinstein's nomination:

"Dr. Weinstein is someone who can show you what you as a trainee are capable of—and is always leading the lab by example. One of his greatest attributes is letting us make mistakes, learn from them and come out of it not feeling less than we are. Dr. Weinstein is extremely supportive of me developing my own ideas and always fosters engaging scientific discussions both in our one-on-one and group meetings. His mentorship has been crucial in allowing me to grow as a scientist and a person in many ways."

Congratulations to all of this year's finalists and winners!

Dr. Brant Weinstein, right, with
Dr. Constantine Stratakis



August Announcements

JOIN OUR LINKEDIN GROUP FOR NICHD ALUMNI

The Office of Education is making a big effort to connect to our former NICHD trainees. We created a LinkedIn group for all of our intramural alumni. Please do consider joining the group through the link below. We will post relevant articles and activities for young scientists and this, our monthly fellows newsletter, *The NICHD Connection*. We will include alumni profiles too, so let us know if you will be starting a new position soon or want to share a story about your professional life. We would even be happy to post job vacancies for you, if your company or organization is looking for talent.

You can find the LinkedIn group by searching for “NICHD Intramural Alumni” or by going directly to https://www.linkedin.com/groups?home=&gid=2209038&trk=my_groups-tile-grp

2015 FELLOWS RETREAT PLANNING: JOIN THE TEAM

The annual fellows retreat each spring allows you to step outside of your specialty, present your research, and connect with colleagues across the institute. All NICHD fellows are invited to serve on the Steering Committee, which will plan our 2015 event for postdoctoral fellows, clinical fellows, and graduate students. This is a great opportunity to use your organizational skills and gain new transferrable skills while working in a team.

Please send a note to Amber Stratman, chair of the Steering Committee, at amber.stratman@nih.gov to express your interest. The group builds the program for the meeting, invites speakers, reviews abstracts, selects fellow/graduate student presenters, moderates sessions, and plans a social outing, among other responsibilities. We hope to start our monthly meetings in September.

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August Announcements (continued from page 14)

SAVE THE DATE: FRIDAY, SEPTEMBER 5, POSTDOCTORAL APPRECIATION PIZZA LUNCH

Room 2A48, building 31
12 noon to 1:30 pm

In the spirit of National Postdoc Appreciation Week next month, NICHD would like to recognize your contributions to our intramural scientific community. You deserve high praise!

FOR ALL NEW FELLOWS: NICHD POSTDOC ORIENTATION

Room 2A48, building 31
Friday, August 29, 10 a.m. to 11:30 a.m.

What unique opportunities are available to you at the NICHD? Learn the answer at our new quarterly NICHD postdoc orientation. This orientation is separate from all of the other orientations and supplements the NIH-wide Office of Intramural Training and Education session. If you recently joined an intramural NICHD lab as a postdoc or visiting fellow, please plan to attend this NICHD-specific event.

Led by the NICHD Office of Education, the orientation will highlight both NICHD and NIH-wide intramural resources for postdoc fellows. Topics will include career planning tools, grant opportunities for fellows, ideas for presenting your science locally, and the core facilities available to you. You will have the opportunity to meet fellows from other research areas and in different buildings. And we will share information on our key programs that support your professional development, complementing the mentored experience you will have at the bench.

NICHD INTERN MAKES THE NEWS

William Long, summer intern in the Weinstein lab, placed in the top five at the International Science Olympiad, a worldwide competition for high school students. His accomplishment made the news, as a correspondent for Fox 5 interviewed William in the new zebrafish facility on campus. The interview aired on Fox 5 news, Wednesday, July 30. Check out the Fox 5 coverage by clicking the link below, and don't forget to congratulate Mr. Long, our local celeb!

<http://www.myfoxdc.com/story/26156321/fairfax-county-teen-places-5th-in-the-world-at-international-biology-competition>

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August Announcements (continued from page 15)

FAES ONLINE REGISTRATION NOW OPEN

Enroll today and earn credits in one of over 70 evening courses offered in Fall 2014 at the Foundation for Advanced Education in the Sciences (FAES) Graduate School at NIH, located on the NIH campuses in Bethesda. A course catalog and registration information can be found at <http://www.faes.org/grad>.

Fall Semester Schedule

July 15 - September 5:	Online Registration
August 21:	Open House
September 8 - 30:	Late Registration (\$10.00 late fee per course applies)
September 8:	Classes begin
December 12:	Classes end

NICHD FELLOWS TO TEACH NEW FAES COURSE

The Foundation of Advanced Education in the Science (FAES) offers more than 120 different courses for undergraduate and graduate students at NIH. This fall, the FAES is hosting several new courses, including BIOL331: "Retroelements: Friends or Foes?"

Retroviruses and retrotransposons impact their host genomes in many ways, from reshaping the genomic landscape to altering regulatory networks. The unique features of retroelements will be discussed in this course, which starts on September 8, 2014. The course will consist of four lectures taking place on Mondays from 5 p.m. to 7 p.m. For more information regarding registration and course details, please visit http://faes.org/course-catalog?field_course_number_value=&field_course_field_value_many_to_one=Biology+and+Genetics&field_day_value_many_to_one=1#n

~Drs. Caroline Esnault and Parmit Singh

August Events

THURSDAY, AUGUST 7, 9 – 3 PM

Summer Poster Day
Natcher Conference Center, Bldg 45
More information at https://www.training.nih.gov/summer_poster_day

THURSDAY, AUGUST 21, 4 – 6:30 PM

FAES Grad School Open House
Bldg. 10, FAES Academic Center, Terrace Area
More information at <http://www.faes.org/grad/>

FRIDAY, AUGUST 29, 10 – 11:30 AM

NICHD Postdoc Orientation
Room 2A48, building 31
See [announcement](#) for more info

