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The NICHD Connection

December 2010

INSIDE THIS ISSUE

Stress in Biomedical Research	1
Letter from the Editor	2
Events	2
Secrets of Dengue Virus Infection Revealed	4
Job Interviewing Seminar Recap	5
A Year in Review	6
Announcements	7

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Stress in Biomedical Research

By Shana R. Spindler, PhD

Stress, the ugly beast that causes anxiety, headaches, and depression (among many other ailments) is a daily encounter for most biomedical researchers. During the holiday season, stress can be amplified as family visits and holiday shopping pile atop the enormous pressure to finish experiments before year's end. So, what are the most prominent sources of stress for the average fellow and what can we do to relieve the tension?

In a recent issue of *Molecular Cell,* Dr. Douglas R. Green of St. Jude Children's Research Hospital in Memphis, TN offers his list of "six impossible things" that postdocs in biomedical research encounter and elaborates on strategies to alleviate the strain these "things" may cause.

Dr. Green begins with the fact that a researcher is not in control of the answers. The thrill of designing an experiment based upon perfect logic, where no other answer could possibly be true, is a trap that many scientists fall victim to at least once in a career. Dr. Green is quick to point out that "Life is not logical, because living things are not designed. Any biological system is a cobbled-together, makeshift affair that once upon a time happened to work better than another contraption…" He contends that the key is to control what you *can* control. Do small pilot experiments and plan carefully so that results can be interpreted and repeated. A lack of repeatability can lead to more stress than an experiment not working in the first place!

A second source of anxiety stems from the struggle to generate that great idea. The continuous need to satisfy an inner drive for making the next mind-blowing discovery can be a foundation for stress. Dr. Green argues that the best way to alleviate the stress of—well, constantly thinking—is to be constantly reading! The more a researcher reads and knows the field, the easier it becomes to enable an overactive mind to piece together disconnected information into a beautiful hypothesis.

The remainder of Dr. Green's "six impossible things" point to the fact that a researcher can be pulled in many directions at once. To counter this reality, Dr.

(continued on page 3)

Letter from the Editor

Happy Holidays! As 2010 comes to a close, many fellows are probably wondering "Where did this year go?!" Over the past twelve months, colleagues have come and gone, experiments have failed and succeeded, families have grown, and careers have inched toward that next step, whatever it may be. While these life milestones can bring a lot of happiness, they can also create quite a bit of stress. In this month's newsletter, *The NICHD Connection* reviews a recently published article in *Molecular Cell* pertaining to stress in biomedical research and ways to cope with common anxieties. Two of the best stress-relievers for any fellow include publishing a manuscript and getting a job! In this light, we're happy to bring you a new "Hot Off the Press" column covering Dr. Elena Zaitseva, Dr. Sung-Tae Yang, and colleagues' recent publication in *Plos Pathogens* as well as helpful hints about job interviews—complete with a list of questions that are commonly asked! Don't forget to check out our "Year in Review," a recap of the NICHD's accomplishments in 2010, and December announcements and events on page 7. Until next year!

Your Editor in Chief,

Shana R. Spindler, PhD
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Events

WEDNESDAY, DECEMBER 8, 12PM

Research Ethics Lunchtime Discussion with Dr. Sergey Leikin on "Recusal"
Bldg 31, Rm. 2A48

Is it OK to be a reviewer of a paper written by a collaborator? How about a paper written by a competitor; a grant application from a friend, collaborator or competitor? How does one respond to a friendly request from a colleague to be a reviewer of his/her paper? What does an NIH FARE judge do when asked to rate an abstract from his/her laboratory? Any experienced researcher has to deal with issues like these monthly if not more often, yet there are no simple universal answers. During this research ethics session on recusal, Sergey Leikin, Head of the Section on Physical Biochemistry, Office of the Scientific Director, will discuss some of the actual cases he encountered in the last couple of years.

WEDNESDAY, DECEMBER 15, 12:45PM

Fellows Lunch Outing to Haandi
Meet in front of Bldg 50
See **announcements** for details

FRIDAY, DECEMBER 17, 4-5PM

NICHD Holiday Party
Bldg 31, Rm. 2A48
See **announcements** for details

Stress in Biomedical Research

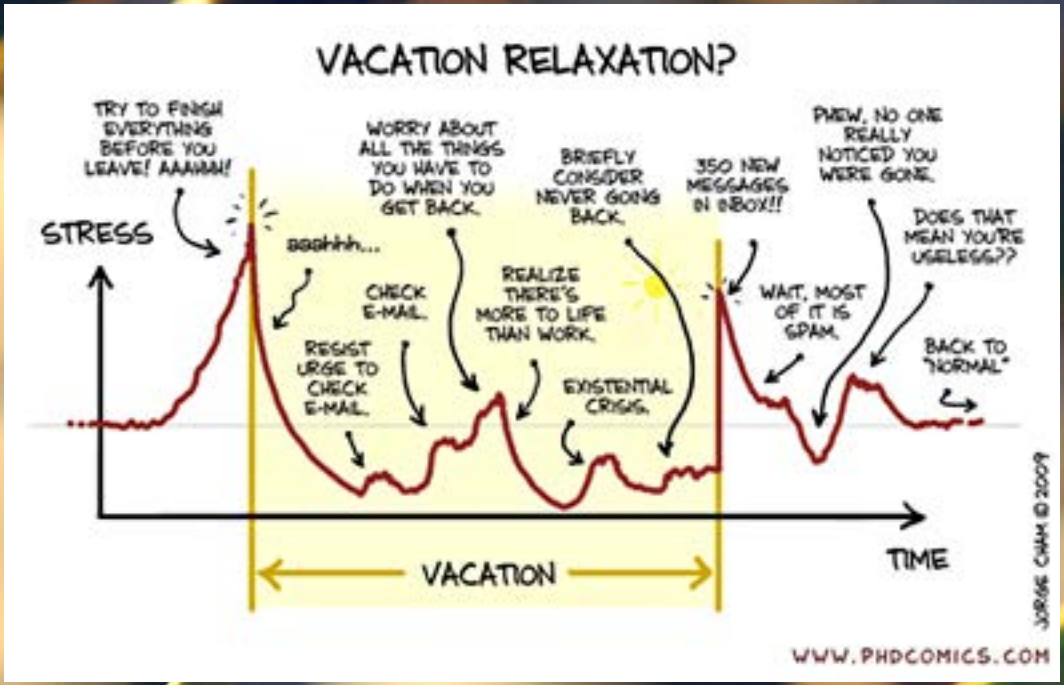
(continued from page 1)

Green recommends avoiding the temptation to put off some of the deadline-less aspects of research, such as developing ideas, analyzing results, or planning future steps. Simply devoting time to the creative facets of research can in-and-of itself be relaxing, thus relieving some of the stress. Of course, this is easier said than done. Just as athletes train to be able to power through physical exhaustion, Dr. Green emphasizes that researchers must "struggle with difficult concepts until we hit a wall and keep thinking." The more training a researcher has thinking through challenging problems, the more likely his/her stress levels can be minimized during future quandaries.

If you'd like to read more advice from Dr. Green—his humor and frankness will make it well worth your time—check out his article "Stress in Biomedical Research: Six Impossible Things" *Molecular Cell*, 2010, vol. 40(2): 176-178, found at: http://www.cell.com/molecular-cell/fulltext/S1097-2765(10)00783-5

If you are experiencing unmanageable levels of stress, check out these resources:

- OITE "Get Help Now" Information: https://www.training.nih.gov/get_help_now
- Helpful Phone Numbers for NIH Staff (including 24-hour crisis hotlines): http://dohs.ors.od.nih.gov/eap/eap_numbers.htm
- Division of Occupational Health and Safety Employee Assistance Program: http://dohs.ors.od.nih.gov/eap/index.htm
- Office of Ombudsman: http://ombudsman.nih.gov



From phdcomics.com September 28, 2009

Hot Off the Press: Secrets of Dengue Virus Infection Revealed

By Shana R. Spindler, PhD

Dengue infection, spread by mosquitoes carrying the Dengue virus, contributes to approximately 22,000 deaths a year according to the World Health Organization (WHO). An estimated 40 percent of the world population inhabits areas of known Dengue transmission, making the Dengue virus a global health threat.

Drs. Elena Zaitseva and Sung-Tae Yang

Dengue virus infects a target cell with a linear, single-stranded piece of RNA containing the entire viral genome. The mechanism by which different viruses fuse to cell membranes varies; the Dengue virus only fuses to a membrane while being trafficked through a transient cellular compartment called the late endosome. Because the timing of viral RNA infection into the cell is critical to viral success, knowledge of the mechanism by which the Dengue virus coordinates its activities could pave the way for highly effective therapies and new infection prevention strategies.

One team studying this mechanism includes members of Dr. Leonid V. Chernomordik's lab at the National Institute of Child Health and Human Development. During preliminary experiments, his group noted that the Dengue virus could neither fuse to the outer membrane of Mammalian cells nor artificial membranes that are routinely used to study the fusion process. The team hypothesized that something must be unique about the membranes in the late endosome that would allow the virus to fuse and inject its RNA.

To identify what made the late endosome competent for Dengue virus fusion, Chernomordik's team, led by Dr. Elena Zaitseva and Dr. Sung-Tae Yang, began testing variables such as membrane composition and membrane electric charge. Through an elegant experimental design, Zaitseva, Yang, and colleagues bound the Dengue virus to a self-quenching fluorescent reporter. Upon viral fusion in the endosome, the self-quenching fluorescent reporter became diluted, and the fluorescence of the cell increased.

Using liposomes (manufactured vesicles composed of lipid bi-layers), Chernomordik's group found that the incorporation of lipids containing a negative charge, known as anionic lipids, allowed efficient Dengue viral fusion. In fact, the addition of anionic lipids to Mammalian cell membranes, or to early compartments of the endocytic pathway, permitted abnormal Dengue viral fusion as visualized by the increased fluorescent read-out. "We were very excited when we found that a lipid co-factor, rather than an additional protein co-receptor, is required for efficient membrane fusion between Dengue viral and cellular membranes," exclaims Zaitseva, "these are really the first and working quantitative assays to follow the fusion mediated by Dengue virus in the field."

Zaitseva explains that "viruses are amazingly adapted to hijack the cell's different pathways and proteins for successful reproduction," and accordingly, "the interactions between Dengue protein and a negatively charged membrane could be a new target for developing antivirals." For future work, Zaitseva rationalizes that their experimental design can be utilized to screen through large numbers of viral fusion inhibitors, bringing the world one step closer to an effective Dengue infection treatment.

Explore their work: Zaitseva et al. (2010). "Dengue Virus Ensures Its Fusion in Late Endosomes Using Compartment-Specific Lipids." *Plos Pathogens* 6(10): e1001131. http://www.plospathogens.org/article/info:doi/10.1371/journal.ppat.1001131

Job Interviewing Seminar Recap

By Melissa Crocker, M.D.

Think about your life in photographs and then try to build short stories around the images. These instructions were at the heart of a job interviewing workshop led by Scott Morgan for a group of NICHD fellows last month. Scott, director of the Morgan Group, is a communications coach who targets scientists. Scott has led several seminars for NICHD members on the art of scientific presentations. During the current job-searching season, Scott offered two recent sessions on optimizing the interview portion of job applications. He notes that applicants spend hours perfecting their CVs but rarely prepare for the interview, which can be equally or more important than the paper application. Scott has constructed a list of 9 standard questions to expect during an interview, including the familiar "tell us about your strengths and weaknesses" and "where do you see yourself in 5 or 10 years?" to the slightly more intimidating "why should we hire you?" He advises preparing for each question by finding a story that exemplifies the qualities you wish to communicate. For example, rather than listing buzz words such as hard-working, motivated, and intelligent, you could instead tell a story that exemplifies these qualities—perhaps one that describes a night you worked late while trying to resolve a problem with an experiment. Such stories may lead interviewers to discern your strengths while helping them to get to know you as a person rather than summarized by a list of adjectives. Scott also emphasized that presentations during a job interview (whether formal or chalk talks) should not be heavily laden with data. Instead, you should focus on why you chose to ask the research question of interest and why you made certain decisions about experiment design. These methods will help demonstrate your thought process and future potential. Interviewers will be more interested in the skills and mental acuity that an applicant can bring to a new job rather than the specific data generated in the current lab. Thus, you should speak more generally about how your current research fits into the objectives of the interviewer's work rather than focusing on the results of your work. Follow these guidelines and Scott guarantees success!

The 9 Standard Question Topics (Plus 2 tricky possibilities):

1. Personal background
2. Academic background
3. Motivation to enter science
4. Motivation to enter specific field
5. Current work (and how it fits into the greater picture)
6. Strengths
7. Weaknesses
8. Why should we hire you?
9. Future plans (where do you see yourself in x years)

Also be prepared for:

- Explaining when you encountered something difficult or describing a challenge you overcame
- Any hypothetical questions (looking for a thought process, not a final answer)

A Year in Review: The Many Successes of 2010

THE LEADERSHIP

On July 22, 2010, NIH Director Francis Collins, M.D. Ph.D. announced the appointment of Alan Guttmacher, M.D. as the NICHD Director. Constantine A. Stratakis, M.D., D(med)Sci continues to serve as the NICHD Acting Scientific Director, a position he has held since July 1, 2009.

NICHD FELLOW OUTREACH

2010 marks the year of the first NICHD Fellows Committee—a group founded to organize networking opportunities and facilitate communication among fellows. The committee has planned new social events and released a novel NICHD newsletter by and for fellows. With the June inaugural issue of *The NICHD Connection*, fellows have been notified about upcoming seminars, fun events, and recent research in a convenient newsletter format.

PUBLICATION RECORD

Approximately 166 intramural articles were published from the NICHD in fiscal year 2010. That's a publication released almost every two days!

NICHD 2010 FELLOW ACCOMPLISHMENT HIGHLIGHTS

- The NICHD had 19 FARE winners with 6 repeat recipients.
- Errett Hobbs, PhD was awarded the Fellow Mentor of the Year.
- Angela Delaney, MD received the Human Growth Foundation Award recognizing outstanding clinical and bench research that may lead to a better understanding of human growth.
- Melissa K. Crocker, MD was awarded both the Obesity Society Travel Grant and the Endocrine Society Travel Grant.
- Miho Matsuda, PhD secured the highly competitive K99 Pathway to Independence award, to be funded by NICHD.
- Yu Chen, PhD earned the 2010 Intramural AIDS Fellowship.
- Emily King, PhD was awarded the Humboldt Postdoctoral Fellowship to conduct research with the Applied Analysis Group at the University of Osnabrück and the Institute of Numerical Simulation at the University of Bonn.

NICHD 2010 P.I. ACCOMPLISHMENT HIGHLIGHTS

- Ramanujan "Manu" Hegde, M.D., Ph.D. was named P.I. Mentor of the Year.
- Tamas Balla, M.D., Ph.D. was elected to the Hungarian Academy of Science.
- Jeffrey Baron, M.D. received the NIH Fellow Committee 2010 Distinguished Clinical Teacher Award.
- Peter Basser, Ph.D. was named a Fellow of the International Society for Magnetic Resonance in Medicine (ISMRM).
- Jennifer Lippincott-Schwartz, Ph.D. received the 2010 Pearse Prize from the Royal Microscopy Society.
- Leonid Margolis, Ph.D. was selected for the Annual Award of the 17th International Conference "HIV, Cancer, and Public Health."
- Keiko Ozato, Ph.D. was granted Honorary Membership in the International Society for Interferon and Cytokine Research.
- Karel Pacak, M.D., Ph.D., D.Sc. received the Gold Jessenius Medal for advances in medical sciences, Slovak Academy of Sciences, Slovak Republic.
- Roberto Romero, M.D. was awarded a Life Achievement Award for contributions to Reproductive Immunology by the American Society for Reproductive Immunology, the Blackwell Munksgaard Award in Reproductive Immunology, and a Distinguished Service Award, presented by the Wayne State University Dean of the School of Medicine.
- Stanko Stojilkovic, Ph.D. received a Doctor Honoris Causa from the University of Novi Sad.
- Stephen Suomi, Ph.D. was selected for the Distinguished Primatologist Award by the American Society of Primatology.

Congratulations to all of the NICHD fellows and PIs on their great accomplishments in 2010!

Announcements

A CALL FOR NEWSLETTER CONTRIBUTORS

Every month, *The NICHD Connection* strives to deliver helpful information, useful recaps, and notable announcements. Because this newsletter is by and for fellows, we can not make it happen without your help. No matter your chosen career path, writing experience will provide a valuable skill for all of your future endeavors. We are currently seeking regular contributors for the newsletter. The commitment time would include a 1-hour meeting per month and a 100-400 word article every few months. The trade-off for a very small time commitment is a great line on your CV, writing practice, article clips, volunteer service, and knowing that you have helped your colleagues by providing a useful service. If you are interested in becoming part of the newsletter team, please email Shana Spindler at Shana.Spindler@gmail.com.

2009 ORNAMENT COMPETITION WINNER: Margaret Ochocinska. An aluminum foil mouse with a twist tie red scarf, climbing a strand of DNA pieced together from Eppendorf tubes.

COME TO THE NICHD HOLIDAY PARTY!

Take a break with other NICHD fellows and PIs, sip on Mulled Cider or Egg Nog, and see who wins the **annual ornament contest**! Join the NICHD holiday party on **Friday, December 17**, from **4-5pm** in the NICHD Conference Room, **Bldg 31**, room **2A48**. It will be a "sweet-tooth" potluck.

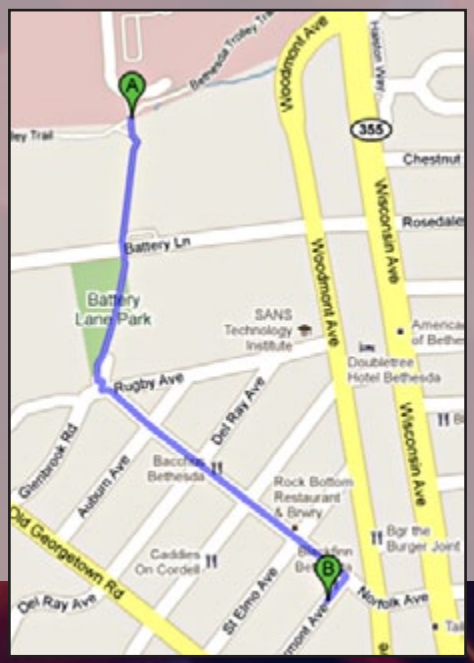
If you'd like to enter the **lab ornament competition**, please see details at ☞ http://fellows.nichd.nih.gov.

THE ANNUAL IMAGE COMPETITION BEGINS!

At any time this year, did you look at your data and think "Wow, I've created artwork!" If so, you should think about entering your original image in the annual image competition for the annual fellows retreat in May—and featured on the poster, the web site, and the cover of the abstract booklet.. For more information, please contact the retreat chair **Kris Langlais** at langlaik@mail.nih.gov.

DECEMBER FELLOWS LUNCH OUTING TO HAANDI

Join us for an NICHD Fellow lunch outing to Haandi, a popular Indian restaurant in downtown Bethesda. Their daily lunch buffet will be sure to satisfy a hungry fellow!

On **December 15th**, we will meet in front of **BUILDING 50** at **12:45PM**. To reach Haandi, we will use the employee pedestrian exit that is just south of building 38A. We will then walk along the trolley trail to Norfolk Ave (see map at right). If your building is already near the south side of campus, feel free to meet us at the pedestrian exit. Hope to see you there!!!

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