

Human Biology Newsletter

The Program in Human Biology | Stanford University

Summer 2011

The Invisible Wounds of PTSD

HumBio students explore the many facets of post-traumatic stress disorder



Stanford Human Biology students study the biological, psychological, and societal aspects of post-traumatic stress disorder (PTSD) during the winter quarter.

One in five soldiers returning from Iraq or Afghanistan suffers from this disorder. The victims of the Japanese earthquake and tsunami may have it. And survivors of life-threatening illnesses may succumb to it.

Post-traumatic stress disorder, or PTSD for short, is an anxiety disorder triggered by a stressful event. Though some people recover fully from it, many suffer from devastating long-term symptoms that sometimes lead to job loss, homelessness, broken families, and substance abuse.

Today PTSD is caught in the crossfire of controversy. It's hard to diagnose and treat. There's an immense social stigma attached to having it, especially in the military. And no one wants to pay for its lingering effects.

All of which makes it the perfect real-world case study for the Human Biology Program as it strives to equip its graduates to address complex, real-world problems that — more often than not — require a comprehensive understanding of the human organism from biological, behavioral, and social perspectives. PTSD is covered in the HumBio “Core,” a foundational course taken by all sophomores.

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DIRECTOR'S MESSAGE

With the 40th anniversary of Stanford's Program in Human Biology right around the corner, faculty and staff have been reflecting on the state of the program, laying the groundwork for its future evolution.



Professor Carol Boggs

Our goal is to continue to provide our students with the best interdisciplinary learning experience, while maintaining HumBio's unique identity. In preparation, we are re-evaluating our core course content, incorporating new learning technologies, and revising our internship requirement to provide an even better learning experience.

We are also continuing to reach out to faculty across the university who are interested in sharing with undergraduates their unique insights into humans, our culture, society and environment.

We would love to hear your ideas about the future of the HumBio program at our 40th birthday reunion on Friday, Oct. 21, 2011. Register [here](#), or send your ideas to cboggs@stanford.edu. §

CURRICULUM

Invisible wounds, cont'd

The Core consists of two parallel, year-long courses; one focuses on biology (the A Side), while the other centers more on the social sciences (the B Side). The PTSD lectures occur in the winter and weave together principles of evolution, social sciences, physiology, and genomics, to provide a foundation for meaningful discussions and insights into this perplexing condition.

“During the winter quarter, PTSD provides the faculty with a cross-disciplinary learning platform that helps the students contextualize a lot of different human biology themes, such as learning and memory; classical conditioning and extinction of fear; nature versus nurture; emotion regulation; and brain biology,” said **David Lyons, PhD**, Associate Professor (Research) in Psychiatry, who runs HB-3B.

Under his direction, PTSD-themed lectures are given by leading researchers and professors in the fields of archeology, biology, psychology, and medicine. More specifically, the class covers these dimensions of the disorder:

- ❖ The physiological processes that create stress in humans — **H. Craig Heller, PhD**, the Lorry I. Lokey/Business Wire Professor who teaches in HB-4A and is a co-author of the textbook, [Life: The Science of Biology](#).

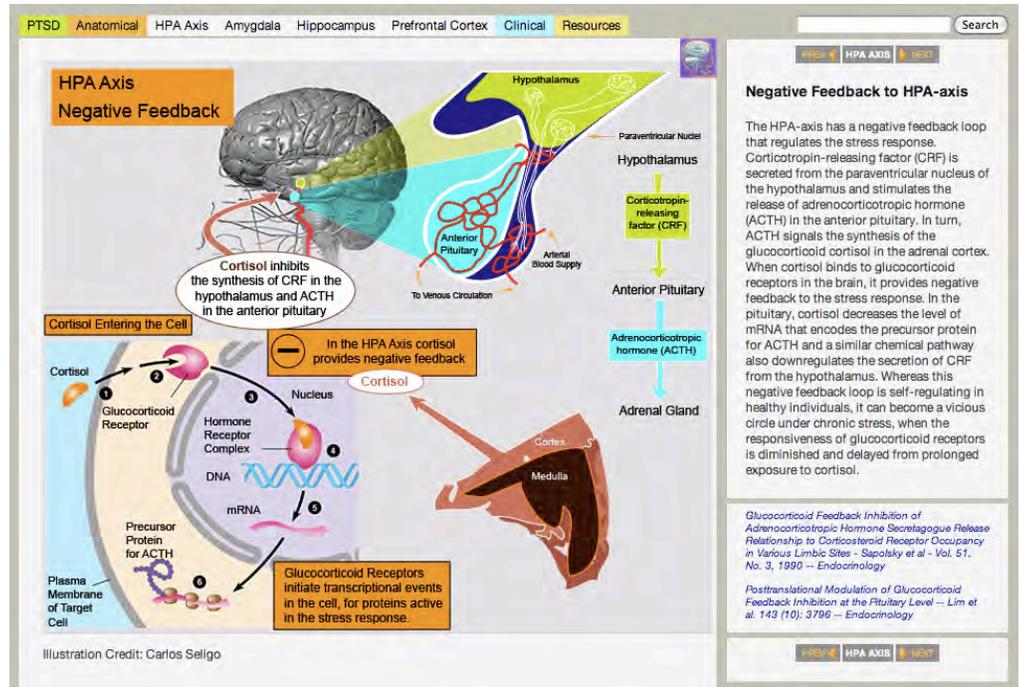
- ❖ The evolutionary forces behind the human brain’s fear response and the cognitive advantages that it provided our Cro-Magnon ancestors over Neanderthal hunter gatherers — **Richard Klein, PhD**, Anne T. and Robert M. Bass Professor of Anthropology and Biology who teaches in HB-2A, and author of [The Human Career](#), a book on the origins of human culture.

- ❖ The development, structure, and function of the human nervous system — **Russ Fernald, PhD**, the Benjamin Scott Crocker Professor of Human Biology.

- ❖ The complex neuro-chemical processes that drive the brain and behavior during periods of stress, as well as epigenetic factors that may allow preselection of individuals resistant to PTSD — **David Lyons, PhD**, Associate Professor (Research) in Psychiatry.

- ❖ How prolonged stress and PTSD weakens the immune system — **Firdaus Dhabhar, PhD**, Associate Professor of Psychiatry, Director of Research, Stanford Center on Stress & Health.

- ❖ How the Veterans Affairs Health Care System treats PTSD and related policy issues — **Stephen Lindley, MD, PhD**, Assistant Professor of Psychiatry, and PTSD specialist at the VA.



The [online PTSD module](#) is an interactive, animated tool that lets students visually explore brain anatomy and neurochemical pathways of stress.

“One of the more interesting medical policy issues that we cover is the question of screening for PTSD,” added Lyons. “The Department of Defense would love to develop a test that would exclude susceptible soldiers from active combat, but is that really ethical? Is it fair to say that all women are excluded from the battlefield just because they statistically have a higher probability of suffering from PTSD? And can any test be 100 percent reliable when it comes to predicting what happens in the heat of battle?”

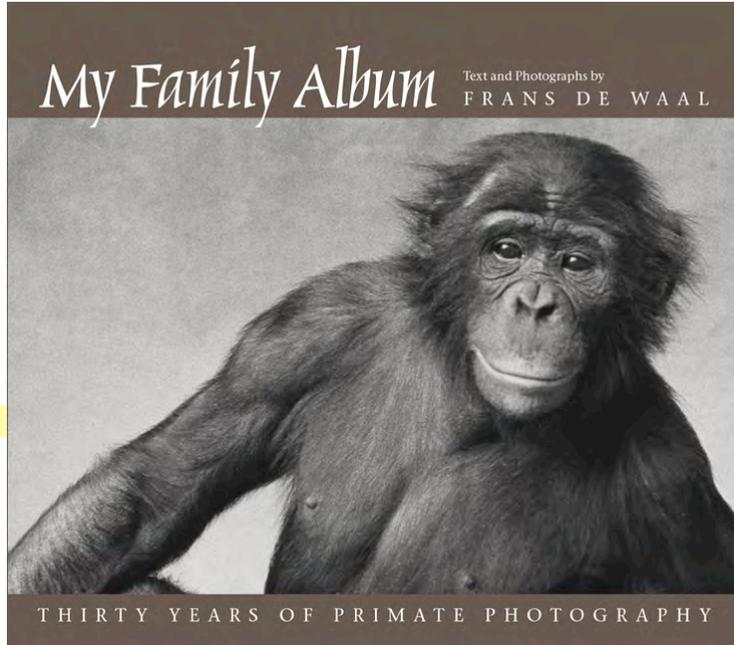
To supplement lectures, HumBio offers an online PTSD learning module to its curriculum, created by **Carlos Seligo**, Academic Technology Specialist. The PTSD module is an interactive, animated tool that enables students to visually explore brain anatomy and neurochemical pathways of the stress reaction. It also includes a glossary, 3D animations, an atlas of neuroscience terminology, links to primary source research articles, video clips of PTSD in

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EVENTS

Basu Lecture Explores the Origins of Human Empathy

In March, Human Biology hosted the “Jhumki Basu Lecture Series in Science and Adventure,” featuring **Frans B.M. de Waal**, a Dutch-American behavioral biologist and Professor of Psychology at Emory University. In the lecture, de Waal draws from his research on primates, dolphins, and elephants to show that many animals are predisposed to take care of one another, come to one another’s aid, and, in some cases, take life-saving action. De Waal argues that human biology similarly offers a giant helping hand to those



Boggs hosts Stanford Travel Galápagos Trip

Over the summer, the faculty leader of this year’s Stanford Travel/ Study Galápagos Expedition was

Carol Boggs, the Bing Director of the Program in Human Biology. During the exploration of this archipelago, Boggs lectured on evolution and conservation, using the Galápagos ecosystem as a living laboratory. Boggs, whose personal research focuses on butterflies, turned her attention to the great diversity of fauna, including brightly colored land and lava lizards, marine iguanas, mockingbirds, Darwin’s finches, and blue-footed boobies.

Stanford alumni and friends who participated spent seven days on an expedition ship exploring the islands, then two days touring the charming city of Quito, Ecuador. For more information on future Galápagos expeditions, visit the [Stanford Travel website](#). §



striving for a just society, and that every human is destined to be humane.

This lecture series is sponsored by the [Jhumki Basu Foundation](#). The foundation was established in



Jhumki Basu

honor of **Sreyashi Jhumki Basu**, (HB '98), who died of cancer in 2008, to realize Basu’s vision of equality in science education. Basu, a former Associate Professor at NYU, also taught science at Castilleja School in Palo Alto, CA, and the Renaissance School in Queens, NY. §

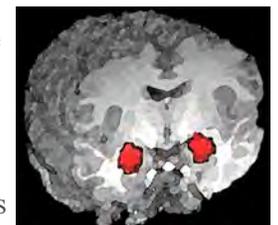
Invisible wounds, cont’d

popular media, and information on diagnosis and treatment challenges faced by returning soldiers.

“This tool helps students drill down a little deeper into

PTSD-related topics in a nonlinear way,” said Seligo, the module’s chief architect. “For example, a lot of students have observed PTSD in the movies without realizing it. So this resource also includes classic PTSD movie clips.”

But beyond providing dramatic fodder for Hollywood, PTSD is a growing and costly problem that this generation will have to pay for in the coming years, either directly or indirectly. In the book, [The Three Trillion Dollar War: The True Cost of the Iraq Conflict](#), Nobel laureate author **Joseph E. Stiglitz** estimated the total cost of veterans’ PTSD-related healthcare and disability expenses to be between \$3 trillion and \$5 trillion — a figure that Congressional reports later confirmed. So, it’s reassuring that future classes of graduating Human Biology students will have such a wide and deep background in this pressing societal issue. §



fMRI activation of the amygdala, the brain’s fear hub, highlighted in red. (NIMH)



Siegel Wins Teaching Award

Robert Siegel, Associate Professor (Teaching) in the Department of Microbiology and Immunology, Program in Human Biology and Center for African Studies, received the 2011 Walter J. Gores Award,

Stanford University's highest award for excellence in teaching.

At this year's commencement, Siegel was honored "for his dedication to developing new teaching materials and approaches, ranging from teaching one of the country's first courses on HIV to promoting alternative spring break,

to helping students better understand the tragic impact of HIV and other viruses, to overseeing the integration of medical microbiology courses into a new Stanford School of Medicine curriculum."

The citation commended Siegel "for his ability to engage students in the intellectual process with lectures that have been described as 'intense, thrilling, awe-inspiring, scintillating,' but never boring."

Siegel also was honored "for his uncommon creativity in teaching difficult material, including performing original poems about viruses and dressing up as a cow for a discussion of mad cow disease."

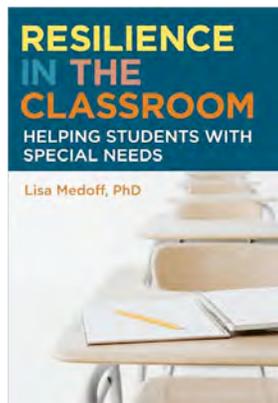
Finally, Siegel was cited "for his encouragement and enthusiasm that inspires all students, from freshmen to postdocs, to be, as one explained, 'a better person, a better student, a better researcher, a better social activist and a better citizen.'" §

FACULTY HONORS

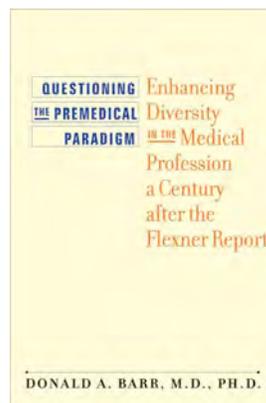
FACULTY BOOKS



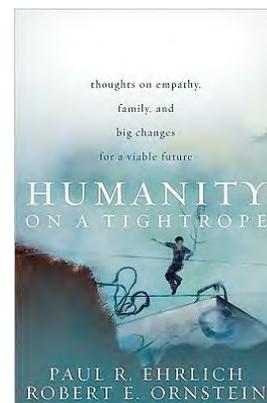
Nathan Wolfe, the Lorry I. Lokey Visiting Professor in Human Biology and founding director of Global Viral Forecasting, has a new book on viruses that will be released in October 2011. [The Viral Storm: The Dawn of a New Pandemic Age](#) tells the story of how viruses and humans have evolved side by side throughout history; how deadly viruses such as bird flu almost wiped us out in the past; and why modern life has made our species vulnerable to the threat of a global pandemic.



Lisa Medoff, (PhD '06), who teaches HB 142: Adolescent Development, has a new book out, [Resilience in the Classroom: Helping Students with Special Needs](#). This book, which serves as tool for educators, provides a trove of specific, realistic techniques for navigating the most troublesome classroom situations. Busting the myth that some students "just can't learn," Dr. Medoff brings to light numerous strategies and effective key phrases, guiding teachers in precisely what to do and say to create an optimal learning environment.



Donald Barr, MD, PhD, Associate Professor (Teaching) in Pediatrics, has published [Questioning the Premedical Paradigm: Enhancing Diversity in the Medical Profession a Century](#). This book raises questions about the use of a pre-medical curriculum developed more than a century ago and makes the case for parallel tracks of undergraduate science education: one largely based on the current system; and a second that would integrate the life sciences in a problem-based, collaborative learning pedagogy.



Paul Ehrlich, Bing Professor of Population Studies and HumBio founder, is co-author of [Humanity on a Tightrope: Thoughts on Empathy, Family and Big Changes for a Viable Future](#). As the world finds itself faced with problems that affect most of the planet's population, a growing sense of empathy and connection with those in remote parts of the world has caught hold and is spreading. This book presents a unique approach to what it means to belong to one human family and how it can help us address the problems that affect us all.

ALUMNI REUNION

HumBio 40th Birthday Program

Friday, Oct. 21, 2011
466 Lomita Mall (Tent near Engineering)
2:00 to 5:30 p.m.

SCHEDULE

2:00-3:00 | Open House
3:00-4:15 | Environmental & Health Policy Speakers
4:15-4:30 | Gifts & Appreciation
4:30-5:30 | Reception with birthday cake!

To register: <http://humbio40th.eventbrite.com>
For assistance, call 650-725-0336



Photo: www.studiocake.com

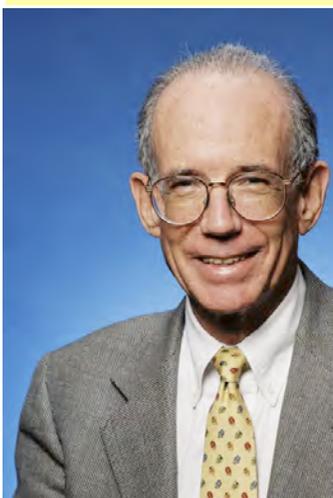
Join us on Facebook, "Stanford HumBio Alumni," which features HumBio founder interviews, or visit the HumBio 40th webpage: <http://humbio.stanford.edu/40th>

In 1971, Richard Nixon was president, the average cost of a new home was \$25,000, Apollo 14 landed on the moon, and HumBio graduated its first class.

In celebration of this momentous occasion, Human Biology is throwing a birthday gala that features talks by noted faculty and alumni, refreshments, birthday cake, and good company. It's free to all Stanford alumni simply by registering at the HumBio Eventbrite website. (No need to register

for Stanford's Alumni Association Reunion Homecoming event to attend.) §

Environmental & Health Policy Speakers



Don Kennedy
President Emeritus
Stanford University
"Climate Change, Energy Policy, and Political Logjam"



Nathan Wolfe
Founding Director, Global Viral Forecasting Initiative
"Before it Strikes: Viral Forecasting for Pandemic Prevention"



Deborah Zarin
Director of ClinicalTrials.gov
"Clinical Trials & Evidence Based Medicine: What You Don't Know Might Hurt You"



Ashley Boren
Executive Director Sustainable Conservation
"Leveraging Partnerships that Promote Sustainability"

A Groovy 1971 Stanford Flashback

This short film, produced in 1971, shows about 100 Stanford biology and chemistry students dancing around a grassy field in hot pants and bell bottoms, reenacting RNA protein synthesis and free love (of biology). You won't want to miss out on the voiceover describing RNA protein synthesis in iambic pentameter, the 13-minute Hendrix-esque soundtrack, and the scientific backstory delivered by the Nobel-winning chemistry Professor Paul Berg. It doesn't get any groovier than this.

<http://www.youtube.com/watch?v=u9dh00iCLww>



STUDENT AWARDS

Three HumBio Students Win Dean's Award

HumBio grads received three of the ten 2011 Deans' Award for Academic Accomplishment, which honors extraordinary undergraduate students for "exceptional, tangible" intellectual achievements. This year's HumBio awardees honored at graduation, were:

☀ **Autumn Albers** (HB '11), of Danville, CA, has combined public service commitments, academic coursework and research interests through her honors thesis. While conducting research in Papua New Guinea, Albers worked with local school boards and health clinics to create and distribute a storybook focused on adolescent sexual health.



☀ **Leander Love-Anderegg** (HB '11), of Cortez, CO, was recognized for his exceptional academic achievement and original research in conservation biology and the biotic impact of climate variation. Love-Anderegg's independent research addressed the ecophysiology of water dynamics as a potential driving factor in Sudden Aspen Death (SAD) in the central Rocky Mountains. Specifically, his study examined the response of aspen trees to drought stress using a combination of field and laboratory work. His thesis also received a David M. Kennedy Honors Thesis Prize and a Firestone Medal.



☀ **Owen Marecic** (HB '11), of Tigard, OR, was honored for his academic achievement in HumBio and for his dedication to studying both microbiology and virology. Marecic excelled in a rigorous academic curriculum while balancing his commitment as a standout football player and has shown promise in both writing and discourse. Also, Marecic has given his time and energy to a variety of worthy causes, including the "Locks for Love" program for individuals undergoing chemotherapy. He was recently drafted to play football for the Cleveland Browns. §



2011 HumBio Awards

University Awards

David M. Kennedy Honors Thesis Prize
Leander Love-Anderegg

Firestone Medal for Excellence in Undergraduate Research
Leander Love-Anderegg
Ronald Pomper
Elisa Zhang

HumBio Departmental Awards

Bernard and Estelle Shuer Award for Outstanding Neuroscience Research
Rachel Becker
Mi Hyun Lee

Bingham Foundation Award for Student Innovation
Pooja Bakhai
Erin Duralde
Katharine Griffin Gorsky

Edith & Norman Abrams Award for Excellence in Public Interest Advocacy
John Benjamin Arevalo

Joshua Lederberg Award for Academic Excellence
Autumn Albers
Serra Favila
Anna Grummon
Jocelyn Ko
Leander Love-Anderegg

Kirsten Frohnmayer Research Prize for Juniors
Lauren Platt
Rachel Kelley

Mary & Jacquelyn Edmonds Prize for Juniors
Ifeyanyi Ulasi Onyeji
Chase Richard

Sandy Dornbusch Award for Excellence in Research Related to Families and Children
Nicole Bitler
Lucia Martinez

Colin S. Pittendrigh Award for Excellence in teaching in Human Biology
Kathleen O'Connor
Lauren Wood

HumBio Student Journal Publications

Lauren Sayres with Prof. Michael Fredericson (Orthopedics)
Physical Medicine and Rehabilitation

Lauren Shapiro with Prof. Garry Gold (Radiology)
Seminars in Roentgenology and Journal of Magnetic Resonance Imaging

Lauren Wood with Prof. Russ Fernald (Biology)
Neurobiology of Learning and Memory

Mischa Li with Prof. Anthony Oro (Dermatology)
Developmental Cell

Max Romano with Prof. Randall Stafford (Stanford Prevention Research Center)
Archives of Internal Medicine

TRAVEL

[Stanford Travel/Study Trips with HumBio Faculty](#)

Tanzania Field Seminar

September 8 to 24, 2011

Study research conservation and land rights issues alongside Stanford sophomores and Professor Bill Durham, '71.



Focus on El Salvador

February 10 to 17, 2012

Marvel at the natural wonders of this pocket-size nation with Professor Bill Durham, '71.



Kingdom of Morocco

March 13 to 29, 2012

Join Professor Herant Katchadourian on a comprehensive journey through the intriguing Western Kingdom.



Papua New Guinea Expedition

March 14 to 30, 2012

Travel with Professor Bob Siegel, MA '77, MD '90, aboard the Oceanic Discoverer to visit the islands of Papua New Guinea, to snorkel and to bird watch.



Around the Cape of Good Hope

March 18 to April 4, 2012

Travel aboard the Clipper Odyssey along the African Wild Coast with president emeritus of Stanford, Donald Kennedy.



Andalucia to Castile Walk

April 30 to May 12, 2012

Join professor Jim Fox and historian Peter Watson on an adventure through the Extremadura region of western Spain, home of the conquistadors – soldiers, explorers and adventurers who plundered the New World and returned to their cities with untold riches.



At the "Abnormal Formal," HumBio students Joyce Truong, Katie Jewett, Julie Campbell, Erin Duralde, Ryan Staatz, and Michal McDowell dressed up as the major food groups.

For more reunion news:

Join us on Facebook:

"Stanford HumBio Alumni"

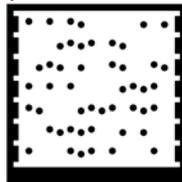
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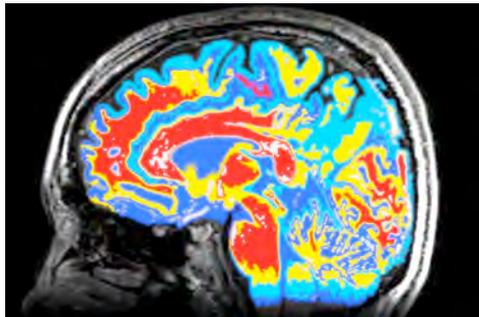
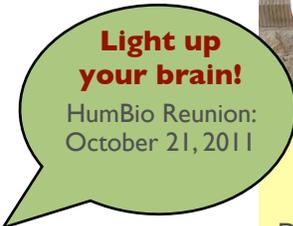
Where to send alumni news and stories:

Attn: Robyn Duby
Stanford Univ., Bldg 20
Stanford, CA 94305
(650) 725-0336
rduby@stanford.edu

For more reunion news, click your phone camera here:



Get the free app at <http://gettag.mobi>



Courtesy Jordan Michael Nechvatal & Deqiang Qiu

Thank You!

Stanford's Program in Human Biology extends its sincere appreciation to our supporters for their generous contributions.

To discuss HumBio gift opportunities or make a gift, contact Cindi Trost, Associate Director for External Relations at (650) 724-2812.



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