

CHaPRE

Center for Human and Primate Reproductive Ecology

Richard G. Bribiescas, Director

Evolution, Life History, Darwinian Medicine, Conservation...

A Yale Institute for Biospheric Studies Research Center

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Director's Report

The past year has witnessed significant growth in interest in CHaPRE, both within and outside of Yale. CHaPRE has either directly or indirectly been involved in supporting a number of research projects that span across varied topics including the sociobiology and ecology of premenstrual syndrome as well as hormonal responses to social stress in chimpanzees. The new year promises continued research, collaboration, and inroads into the evolution of human and non-human primate life history biology.

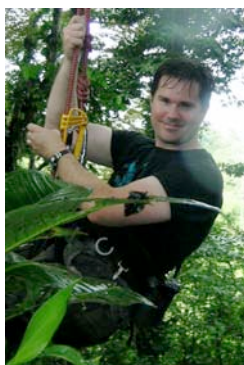
New Methods, New Training, New Collaborations

One of the most important charters of CHaPRE is to provide and facilitate laboratory training to those wishing to incorporate reproductive biology into their research projects. For example, CHaPRE sponsored Yale Ph.D candidate Sholly Gunter to travel to the Biodemography Laboratory at the University of Washington, Seattle for intensive training in new hormonal assay protocols that she then brought back to Yale. CHaPRE is grateful to Dr. Kathleen O'Connor and Eleanor Brindle for their gracious generosity and cooperation.

New Courses and Training Opportunities

CHaPRE post-doctoral research associate and lecturer in biological anthropology, Stephanie Anestis, is currently teaching a laboratory methods course that will allow future CHaPRE researchers to more effectively utilize available resources. Dr. Anestis is instructing basic methods in radio and enzyme immunoassay, the central means of assessing hormones and immunological agents. Current plans are to continue pursuit of the necessary resources to continue this training program in the foreseeable future.

Featured Scientist: Gary Aronson



Research Associate, Yale Biological Anthropology Laboratories, CHaPRE Research Fellow

Gary Aronson received his Ph.D from Yale University in biological anthropology in 2005 and is currently director of the Biological Anthropology Laboratories at Yale University. He is also a CHaPRE Research Associate assisting with the day to day operations of the endocrinology laboratory. Dr. Aronson discusses a new field course offering in Panama.

New Primate Field Course offered at Yale Summer Sessions/Department of Anthropology

The summer of 2006 will mark the inauguration of a field course that I will be running in primate ecology and behavior. The course will span from 15 May to 11 June and focus on the methods and techniques of behavioral sampling, habitat measurement, and associated statistical analyses. The goals are to develop students' abilities in hypothesis formulation, data collection and analysis, report-writing, and professional presentations.

The course is conducted through a partnership between Yale and the Institute for Tropical Ecology and Conservation. ITEC is based at Bocas del Toro, Panama, a small island in the Northeastern end of the country. Director Pete Lahanas has run field courses from here since 1995, and the site boasts beautiful beaches, coral reefs, cabanas and dormitories, and a restaurant known throughout Panama and Central America. ITEC has since built a computer center and classroom, library, and a

working laboratory for various tropical research projects.

The area around the station contains a patchwork of forests. A large swamp forest (dominated by *Raphia* and *Symphonia*) and a terra firma climax forest are the central areas of primate research, while mangroves and patches of regenerating forests offer additional habitats for exploration and research. The forests have several large, habituated groups of the mantled howler (*Alouatta palliata*) and white-faced capuchins (*Cebus capucinus*), and owl monkeys (*Aotus trivirgatus*) were observed in 1998, but may be more rare today. There are reports of spider monkeys (*Ateles sp.*) sightings on the peninsula across from the station, and confirming their presence is a priority for the 2006 season. Of course, the forests also contain a host of animals, from dart frogs, pit vipers, and tamanduas to parakeets, bats, and curacaos. While Bocas remains a paradise in many ways, development and economic investment in tourism is beginning to take a toll, an issue that will be a significant part of the coursework and continuing research at the site.



Fieldwork in non-human primate reproductive ecology: A female *A. palliata* in Panama urinates on photographer (photo by Gary Aronsen)

I first visited the site in 1998, as part of my dissertation preparation for fieldwork in Uganda. After I completed my dissertation, I returned as an instructor for December 2004. The typical day in Bocas will be no surprise for most primatologists: up before dawn, stuffing PBJs down while walking to the forest edge, waiting for the first howls of the morning. Then it's into the forest, finding and recording the primates of interest. We complete the usual entertaining routine: winding through swampy, muddy trails, identifying individuals, and watching out for the usual assortment of dangerous tropical beasts, and then its back to camp for a fine meal at the restaurant, a cold beer (or two), and a brief lecture on primate biology, ecology, and behavior. Repeat as needed. Some added benefits to this field course include a short break to see a

completely different environment. We conduct a mainland visit for a cloud forest hike and a wonderful town with flowers, shops, and hot springs. We also have a canopy access expert at Bocas who has offered to teach interested individuals single-rope access techniques, which Gary tested by climbing a 90-foot tall tree (this alone is worth watching).

The Yale Primate Ecology and Behavior Field Course is planned to be a standard part of the Yale course offerings, and the future may allow expansion via more comprehensive coursework at Yale and/or in Panama, and additional courses in tropical ecology and conservation. The ITEC team and I are also working to develop a second, more permanent field station on the nearby Soroopta peninsula, an area currently being considered for purchase as a forest tract and additional site for field courses and research. Ultimately, the goals are to continue integration of Yale research and education with the conservation and community goals of ITEC, and emphasize preservation and commitment to the Bocas populations – both human and nonhuman. It is hoped that CHaPRE investigations may eventually become part of this field course, thereby expanding the potential opportunities for field training and research among Yale graduate and undergraduate students. For more information on the course, contact Gary directly at (gary.aronsen@yale.edu).

- Gary Aronsen, Ph.D.

CHaPRE Sponsors Intensive Laboratory Training at Biodemography Laboratory, U Washington

Thanks to the generosity and cooperation of Drs. Kathleen O'Connor and Eleanor Brindle of the Biodemography Laboratory at the University of Washington, CHaPRE sponsored Yale Ph.D. candidate in Biological Anthropology Sholly Gunter, to travel to Seattle and engage in an intense one week training session during January of 2006. During her stay, Gunter engaged in learning enzyme immunoassay methods in assessing gonadotropin and steroid hormones in non-human primate urine. Gonadotropins are regulatory protein hormones produced by the pituitary gland at the base of brain. They play central roles in the overall physiology and function of ovarian and testicular function. The significance of this training is that it will allow Gunter to assess previously undescribed reproductive hormone values in wild chimpanzees in order to understand the underlying sources of steroid hormone variation in response to ecological stresses. It will also be possible to examine age related changes in these hormones in

previously collected samples from captive chimpanzees.

CHaPRE is grateful to O'Connor and Brindle for their gracious services and hopes this is only the first of many interactions and exchanges.

For more information on the Biodemography Laboratory at the University of Washington, please refer to: <http://depts.washington.edu/%7Eendolab/>.

CHaPRE supports research project on the reproductive ecology of premenstrual syndrome



Chris Rieber, Ph.D., MPH., Assistant Professor of Anthropology, Binghamton University

CHaPRE is currently supporting research by Dr. Chris Rieber on the etiology and evolutionary biology of premenstrual syndrome. Here, she discusses her interest in this topic and her present research.

Premenstrual Syndrome (PMS) is truly a puzzle. It has been written about since at least the early Greeks, recognized in medical contexts for centuries, and documented and studied in rural and urban women the world-over (Asia, Africa, Europe, Australia, and the Americas). Prevalence estimates range between 8 and 90 percent of women affected, and between 3 and 40 percent incapacitated by PMS each month. The true prevalence of PMS is difficult to determine for a variety of reasons, including self-treatment and differences in treatment-seeking behavior, cultural factors, discrepancies in medical access, and differences in definitions and diagnostic practices. No definitive test exists for PMS. No etiological agent has ever been found; and no underlying proximate mechanism has been revealed. There are currently over 65 different

instruments used for assessing PMS, and over 150 symptoms associated with the syndrome. Moreover, standard definitions and diagnostic criteria differ greatly between authorities (DSM and ICD), and even more between physicians. Thus, women with nothing in common but their gender can be diagnosed with the same syndrome! In essence, we all know that PMS is real, and we recognize it when we see it or experience it, but no one knows what it really is.

The adaptationist paradigm offers a logical framework from within which to investigate PMS. Like the evolutionary understandings of pain (Alexander, 1986), psychological pain (Thornhill & Thornhill, 1990), and moods and emotions (Nesse, 1991), the changes associated with PMS may represent an affective pattern that functions to change the behavior of self and/or others in fitness-enhancing ways. It might function variably, for instance, by calling attention to the reproductive cycle, recalibrating reproductive decision-making, allowing women to negotiate help, expel mates who have been ineffective reproductive partners, or a wide variety of other behaviors that alter ultimate reproductive schedules and output. At the most basic level, if patterns of cyclic physical and psychosocial changes are an adaptive response designed by natural selection, they should be related to evolutionarily relevant factors such as reproductive value, resources, and number of children.

My current collaboration with CHaPRE is allowing me to explore this possibility. In addition to collecting *a priori* self-reports of PMS and symptoms, I am collecting symptom ratings as well as saliva samples from women every day across two menstrual cycles. These data will allow me to evaluate the evolutionary model and examine the relationships between the model components, symptoms, and progesterone and estradiol levels. This is important because, while previous research exploring the role of sex hormones in PMS has failed to find any significant or explanatory relationships, it has been carried out without the benefit of an ultimate theoretical framework to guide the exploration.

I envision continuing work on this topic to include investigations of whether and how the impact of differing environmental and ecological stressors on sex hormones may affect the experience of PMS, and the cross-cultural patterns in the relationships between hormonal states, evolutionary predictors of symptomatology, and PMS epidemiology.

- Chris Reiber, Ph.D., MPH.

Professor Reiber received her doctoral degree in Physical Anthropology from the University of Pittsburgh. After cross-training as a post-doctoral fellow in Epidemiology, working in the biotechnology industry, and directing the analytical division of a research consortium, she has returned to academia and joined the Anthropology Department at Binghamton University. Her research

interests revolve around novel applications of the Darwinian medicine framework to women's reproductive health (Premenstrual Syndrome, menopause), cardiovascular health (perimenopausal changes and cardiovascular risk factors in women), substance abuse and treatment (addictions; women and substance abuse), and epidemiological sciences.

Supporting and Collaborating with CHaPRE

If you are interested in supporting or collaborating with CHaPRE, please contact the director, Richard G. Bribiescas (203-432-3671). Proposals are accepted at any time.

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