

COMPARATIVE ANTHROPOGENY: FROM MOLECULES TO SOCIETIES

Virtual Public Symposium · Saturday, October 16, 2021

Co-chairs:

Pascal Gagneux, University of California, San Diego

Alyssa Crittenden, University of Nevada, Las Vegas

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BIOGRAPHICAL SKETCHES: CO-CHAIRS



Pascal Gagneux is a Professor of Pathology and Anthropology, UC San Diego, and Associate Director, Center for Academic Research and Training in Anthropogeny (CARTA). He has a strong interest in the evolutionary mechanisms responsible for generating and maintaining primate molecular diversity. The Gagneux Lab studies how this diversity affects susceptibility to infection and reproductive compatibility by comparing cell surface molecules, glycans (sugar chains), in closely related primates species. Past pathogen regimes have shaped these molecules in different species and sexual selection (via cryptic female choice) might have contributed to reproductive incompatibility and speciation due to female immune rejection of sperm or fetal cells decorated with incompatible glycans.



Alyssa Crittenden is an Associate Professor, Department of Anthropology, and Adjunct Associate Professor, School of Medicine, University of Nevada, Las Vegas. She is a human behavioral ecologist and nutritional anthropologist who has worked with the Hadza hunter-gatherers of Tanzania since 2004. Her primary research interest is the study of the evolution of human behaviors as a function of socioecological context. Her other research foci include: evolution of the human diet; evolution of childhood; children's foraging and food sharing; nutritional and behavioral correlates of cooperative breeding; life history theory.

BIOGRAPHICAL SKETCHES: SPEAKERS



Carol Marchetto is an Assistant Professor of Anthropology at UC San Diego. She earned a BSc in Biological Sciences in 1998 and a Ph.D. in Microbiology in 2005 from University of Sao Paulo, Brazil. Marchetto moved to San Diego in 2005 for her postdoctoral research in stem cells and neuroscience in the lab of Fred Gage at the Salk Institute. Prior to her appointment at UC San Diego, she was a Staff Scientist at the laboratory of Genetics at The Salk Institute where she led projects that studied neuronal development using human and nonhuman primate stem cells. Her current work focuses on using patient-derived induced pluripotent stem cells to study the cellular behavior of human neurons in neuropsychiatric and neurodevelopmental conditions such as Autism and Bipolar Disorder. Marchetto's work is also focused on human evolution in the context of human brain expansion and neuronal development. Her innovative approach uses stem cell models from human and nonhuman primate species to test hypotheses about the role of disruptions to human-specific cellular and molecular signatures in development and their potential impact on mental health. She is a BRAINS Program Fellow, and her work has received funding from National Institutes of Mental Health and the Larry L. Hillblom Foundation.

BIOGRAPHICAL SKETCHES: SPEAKERS (CONTINUED)



Joseph Hacia is an Associate Professor of Biochemistry and Molecular Biology at the University of Southern California (USC) Keck School of Medicine. His laboratory focuses on identifying human adaptations to diet, such as the increased exposure to animal fats. They have uncovered human-specific differences in the metabolism of phytanic acid, a branched chain fatty acid present in ruminant fats, dairy products, and certain fish, relative to the great apes, which could affect the function of multiple organ systems and transcriptomes of these species. Similar human-specific differences were observed when investigating the levels of red blood cell plasmalogens, membrane ether phospholipids critical for numerous physiological processes ranging from cognition to reproduction to aging. His group also focuses on identifying the genetic and molecular basis for a group of human neurological disorders caused by impaired peroxisome function, such as peroxisome biogenesis disorders and X-linked adrenoleukodystrophy (X-ALD). In addition, Hacia's laboratory is engaged in collaborative projects aimed at identifying more effective therapeutic intervention for these disorders. This is especially important given the impending nation-wide screens for affected newborns. He was a Howard Hughes Medical Institute Predoctoral Fellow, a recipient of the American Society of Human Genetics Postdoctoral Translational Research Award, and a V Foundation for Cancer Research Scholar. He has served on the editorial boards of *Genome Research*, *Nucleic Acids Research*, and *BMC Genomics*. He is also a member of the American Society of Human Genetics, American Society of Gene and Cell Therapy, and NIH grant review panels. Furthermore, he is active in graduate and medical education and is a Chair of Medical Education at the USC Keck School of Medicine.



Ajit Varki is a Distinguished Professor of Medicine and Cellular & Molecular Medicine, UC San Diego, Adjunct Professor, Salk Institute, Co-Director, Center for Academic Research and Training in Anthropogeny (CARTA), Co-Director, Glycobiology Research and Training Center (GRTC), Executive Editor of *Essentials of Glycobiology* (Cold Spring Harbor, 2009), Co-author of *Denial* (Hachette, 2013), and Member of the National Academy of Medicine and the American Academy of Arts and Sciences. He served as President, Society for Glycobiology, Editor-in-Chief, *Journal of Clinical Investigation*, and President, American Society for Clinical Investigation. His research focuses on sialic acids in biology, evolution and disease - in relation to explaining human origins.



James Rilling is a Professor of Anthropology at Emory University, with a secondary appointment in the Department of Psychiatry and Behavioral Sciences. He is also an affiliate scientist at the Yerkes National Primate Research Center, and a faculty member of the Center for Translational Social Neuroscience. Rilling and his colleagues use non-invasive brain imaging techniques to compare brain structure and function in monkeys, apes and humans, with the goal of identifying human brain specializations and informing our knowledge of human brain evolution. In addition, his lab conducts research on the biological bases of human social behavior, with an emphasis on cooperation and paternal caregiving.



Nissi Varki is Professor of Pathology at UC San Diego. She obtained her primary medical degree at Christian Medical College, Vellore, India, one of the foremost medical institutions in South-East Asia, and became US Board Certified in Anatomic and Clinical Pathology, following pathology residencies at Creighton University, Omaha, Nebraska, and St. Louis, Missouri. She went on to acquire postdoctoral training in tumor immunology, first at Washington University in St. Louis, and then at the Research Institute of Scripps Clinic in San Diego. After a short stint on the faculty in the Department of Pathology at UCLA, she moved to UCSD in 1985. After a period of NIH-funded basic research on the mechanisms of cancer metastasis, she started up four histopathology core laboratories at UCSD, helping investigators analyze normal and diseased tissues, particularly those from genetically altered mice. Varki serves on the School of Medicine Recruitment and Admissions Executive Committee and teaches sophomore medical students. She also teaches immunohistochemistry and histopathology to medical and graduate postdoctoral fellows, and helps students attain histotechnology certification. She also teaches an elective course for graduate and medical students entitled "Practical Histopathology in Mouse Models of Human Disease." In recent years, she has focused her expertise in immunohistology and pathology towards comparisons of humans and great apes, our closest evolutionary cousins, discovering several differences that are of known or potential biomedical importance.

BIOGRAPHICAL SKETCHES: SPEAKERS (CONTINUED)



Polly Wiessner is a Professor of Anthropology at Arizona State University and a Research Professor at the University of Utah. She has conducted fieldwork among the Kalahari Bushmen for 44 years, focusing social security networks to reduce risk in the hunter-gatherer way of life. Her recent Kalahari work has been on the anthropology of the night to understand what is accomplished socially in the hours around the hearth at the close of the day. Her second field site is among the Enga of Papua New Guinea where she has conducted 35 years of research on exchange, ritual and warfare. Currently she is studying restorative justice in customary courts among the Enga and how it is being used to update norms and practices to address problems introduced by new technology, a rapidly growing population, and entrance into the global economy.



James O'Connell is a Distinguished Professor Emeritus of Anthropology at the University of Utah. He is a member of the National Academy of Sciences, USA, an Honorary Fellow of the Australian Academy of Humanities, and a Fellow of the American Association for the Advancement of Science. He is on the editorial boards of the *Proceedings of the National Academy of Sciences* and the journal *Australian Archaeology*. O'Connell earned his undergraduate and postgraduate degrees at UC Berkeley (Ph.D. 1971). Working with Robert Heizer and Robert Rodden, his Ph.D. dissertation examined the prehistoric archaeology of the western Great Basin. After graduation, he took a post at UC Riverside for three years before accepting a Research Fellowship at the Australian National University (ANU). There, he undertook ethnoarchaeological work with Alyawarra and Anmatjere speakers (dialects of Arrernte) near Bunday River Station in the Northern Territory of Australia. Though originally planned as a study of site structure, O'Connell had been influenced by Robert MacArthur's Geographical Ecology, which led him to undertake quantitative observations of subsistence behavior in addition to studies of material remains. After several years at ANU, O'Connell accepted a position at the University of Utah in 1978 where he continued ethnoarchaeological and archaeological research in Western North America and Australia. He also started additional projects in Africa, most notably his research with Hadza hunter-gatherers in Tanzania. Collaborating with Kristen Hawkes (Utah) and Nicholas Blurton Jones (UCLA), their research sought to explain the evolution of human life histories, Plio/Pleistocene hominin hunting strategies and the emergence of the genus *Homo* from an evolutionary ecological perspective. To date, O'Connell has published over 150 books, journal articles and book chapters, including seminal work applying evolutionary ecology to human behavior, novel ethnoarchaeological work linking behavioral ecological explanations of human behavior to its material consequences and applying these insights to prehistory. Applications of the latter include recent work with Jim Allen (LaTrobe University, Melbourne) directed toward understanding the Pleistocene colonization of Sahul (Pleistocene Australia/New Guinea).



Dietrich Stout is a Dietrich Stout is an Associate Professor of Anthropology at Emory University, where his Paleolithic Technology Laboratory (scholarblogs.emory.edu/stoutlab) investigates the role of technology in human evolution. He is also Associate Director of Emory's cross-disciplinary Center for Mind, Brain, and Culture (cmbc.emory.edu), which promotes diverse and integrative research into human nature and experience. Stout received his Ph.D. in Paleoanthropology in 2003 from Indiana University, Bloomington, where he studied with Professors Kathy Schick and Nicholas Toth. He then spent one year as a Visiting Assistant Professor in Anthropology at George Washington University and four years as a Lecturer (equivalent U.S. Asst. Prof.) in Paleolithic Archaeology at the University College London Institute of Archaeology before relocating to Emory in 2009. His research focus on Paleolithic stone tool-making and brain evolution integrates field research at Plio-Pleistocene archaeological sites in Ethiopia with laboratory and museum research including artifact analysis and experimental replication, functional and structural neuroimaging, behavioral analysis, and psychometric testing. His work is published in discipline-specific journals ranging from *Current Anthropology* and the *Journal of Archaeological Science* to *Neuroimage* and the *Journal of Neuroscience*, as well as multidisciplinary venues such as the *Proceedings of the National Academy of Sciences*, and *Science*.



Rafael Núñez is a Professor of Cognitive Science at UC San Diego. He investigates cognition from the perspective of the embodied mind. Núñez is particularly interested in high-level cognitive phenomena such as conceptual systems, abstraction, and inference mechanisms, as they manifest themselves naturally through largely unconscious bodily/mental activity (e.g., gesture production *co-produced* with a variety of conceptual mappings). His multidisciplinary interests bring him to address these issues from various interrelated perspectives: mathematical cognition, the empirical study of spontaneous gestures, cognitive linguistics, psychological experiments, neuroimaging, and ethnographic field research investigating spatial construals of time in the Aymara culture of the Andes, and more recently, in the remote Yupno culture of the mountains of Papua New Guinea. His 2001 book, *Where Mathematics Comes From: How the Embodied Mind*

Brings Mathematics into Being (with UC Berkeley linguist George Lakoff) presents a new theoretical framework for understanding the human bio-cultural nature of mathematics and its foundations. He is the director of the Embodied Cognition Laboratory at UC San Diego with lab space and members dedicated to investigating how cognition is grounded on the peculiarities, experiences, and limitations of the human body. Originally from Chile, he is also a Swiss citizen after living many years in Europe.