



# ANTH 203 Introduction to Anthropogeny

- FORMAT:** 2 HOUR LECTURE AND 1 HOUR DISCUSSION, in person SSRB 310
- READING:** Broad review or book chapters, posted on the website as downloadable pdfs in advance
- DAY:** THURSDSDAY
- TIME:** 1-3:50 PM
- LOCATION:** SSRB 310
- EXAM:** A) Student questions about each reading sent to instructor each week.  
B) Student presentation in teams of two.  
C) 10 page essay "key questions in anthropogeny".
- GRADES:** Grades will be based on student participation throughout, student questions about the reading, quality of the team presentation, and quality of the ten-page essay.

**WEB PAGE:**

September 22: HUMANS AS PECULIAR MAMMALS AND PRIMATES

Instructor: Pascal Gagneux

Learning Objectives: Our place on the evolutionary tree of life. The molecules of life and how these help piece together the relationships between humans and all other organisms. Phylogenies as "grand summaries" of successful past reproduction. Primate mating systems and cultural impact on human mating systems. The importance of parenting and the delays in human development (childhood and adolescence).

Levels covered: phylogeny, the hominin fossil record, biochemistry (nucleotides, glycans, lipids, and proteins), reproductive biology, development, ecology, social organization.

No Reading

September 29: GENETICS AND THE EVOLUTION OF THE HUMAN GENOME

Instructor: Pascal Gagneux

Learning Objectives: Origins of the human genome structure and sequences as inferred from comparison with other primate genomes. Qualitative and quantitative character of genetic variation in the human population and how that compares to other well studied species. Genetic distinctness of Homo sapiens.

Levels covered: genome biology, DNA sequences, mechanisms of gene variation and its functional consequences, population genetics, mating systems.

Reading:

1. [The evolution of human reproduction: a primatological perspective](#). Martin RD. Am J Phys Anthropol. 2007;Suppl 45:59-84
2. Genetic and Genomic Features Unique to the Human Lineage. O'Bleness, M., Searles, V., Varki, A., Gagneux, P. and Sikela, J. 2012. Nature Reviews Genetics.

October 6: NUTRITION, ANATOMY, AND PALEONTOLOGY

Instructor: Pascal Gagneux

Learning Objectives: You are what you eat and (until very recently) you eat where you are. Understanding the paleontological record as living ecology. Human nutrition in its comparative context. Homo coquinus?

Levels covered: nutrition, ecology, metabolism, anatomy, bone development, chemistry, paleoclimate, bones and stones.

Reading:

3. Evolution of Early Homo: an integrated perspective. Anton, S.C, Potts, R., Aiello, L.C. 2014. Science.
4. Thompson, J., Carvalho, S., Marean, C., & Alemseged, Z. (2019). Origins of the human predatory pattern: The transition to large-animal exploitation by early hominins. Current Anthropology, 60(1), 1– 23.

October 13: COMPARATIVE BRAIN ANATOMY

Instructor: Pascal Gagneux

Learning Objectives: How brains with many shared characteristics, but with big size differences, can generate very different minds.

Levels covered: anatomy, cell biology, cellular architecture, neurobiology, histology, development, comparative anatomy.

Reading:

5. The Human Brain: Evolution and Distinctive Features. [T.M.Preuss](#). in "[On Human Nature](#) -Biology, Psychology, Ethics, Politics, and Religion. 2017.

6. Human brain evolution, Andrey Verendeev, Chet C Sherwood, Current Opinion in Behavioral Sciences, Volume 16, 2017,Pages 41-45,

October 20: COMPARATIVE MEDICINE

Instructor: Pascal Gagneux

Learning Objectives: Using disease differences between Humans and "Great Apes" as a window into "Human Uniqueness". The price of human evolutionary novelty. Medical consequences of mismatch between environment of evolutionary adaptation and "modern" life.

Levels covered: genetics, biochemistry, immunology, physiology, evolution in health and disease, society and mental health.

Reading:

[7. Biomedical differences between human and nonhuman hominids: potential roles for uniquely human aspects of sialic acid biology](#). NM Varki, E Strobert, EJ Dick Jr, K Benirschke, [A Varki](#) - 2011 - Annual Review of Pathology: Mechanisms of Disease

8. Evolutionary medicine: its scope, interest and potential [Stearns Stephen C](#). 2012 Proc. R. Soc. B.2794305–4321.

October 27: LANGUAGE AND COMMUNICATION

Instructor: Pascal Gagneux

Learning Objectives: Contrasting the uniqueness of human language with the many complex communication systems of other animals. Contemplating the behavioral consequences of language as a species-specific, open-ended communication system with rapidly arising understanding barriers between different languages.

Levels covered: animal communication, origin of language, basic linguistics, anatomy of speech, molecular aspect of speech e.g FOXP2, theory of mind, sharing brains through language.

Reading:

[9. Human Variability and the Origins and Evolution of Language](#). TW Deacon . in "[On Human Nature](#) -Biology, Psychology, Ethics, Politics, and Religion. 2017

10. The role of the lie in the evolution of human language, Daniel Dor, Language Sciences,Volume 63, 2017,

November 3: CELL BIOLOGY AND NEUROSCIENCE

Instructor: Pascal Gagneux

Learning Objectives: Appreciating biology at the level of a cell. From cells to organisms and societies. How cellular processes contribute to body and mind. The use of stem cells as evolutionary toolkits to generate and test trans-disciplinary hypotheses.

Levels covered: cell biology, biochemistry, gene expression, cell fate: from cells to tissues and organs.

Reading:

11. Induced pluripotent stem cell technology: a decade of progress. Y Shi, H Inoue, JC Wu, S Yamanaka-

Nature reviews Drug discovery , 2017.

12. Marchetto, M.C., Hrvoj-Mihic, B., Kerman, B.E., Yu, D.X., Vadodaria, K.C., Linker, S.B., Narvaiza, I., Santos, R., Denli, A.M., Mendes, A.P., Oefner, R., Cook, J., McHenry, L., Grasmick, J.M., Heard, K., Fredlender, C., Randolph-Moore, L., Kshirsagar, R., Xenitopoulos, R., Chou, G., Hah, N., Muotri, A.R., Padmanabhan, K., Semendeferi, K., Gage, F.H. [Species-specific maturation profiles of human, chimpanzee and bonobo neural cells.](#) (2019) Elife. 8. DOI: 10.7554/eLife.37527

November 10 BIOLOGICAL ENCULTURATION

Instructor: Pascal Gagneux

Learning Objectives: Organizational bases of social life and the power of cultural phenomena: the ethnographic record. Humans are biologically cultural and culturally biological. Reconstructing past social and cultural behavior based on fossils and archeology. How Humans study humans: research methods of classical anthropology, the standard cross-cultural sample. Studying human societies in a globalized world.

Human biology and culture —often seen as separate— have interacted over evolutionary and historical time in rich and complex ways. Special emphasis will be put on how cultural practices and traits such as cooking, animal domestication, writing technology, art, and mathematics, have actually affected and modified the very biological phenomena that made us the animal we are: from anatomical features to the immune system, from the genome to the brain.

Levels covered: Levels covered: social systems, social norms and sanctions, rituals, rites of passage and institutions. cultural evolution, archaeology, paleontology, history of anthropology, social versus natural sciences, sociology of science, the problems with studying ourselves.

human cultural niche, cooking and tool use as cultural forces that shaped human biology.

Reading:

[13. Darwin's Unfinished Symphony: How Culture Made the Human Mind. Chapter 1. Laland, Kevin 2018 Princeton](#)

[14. Is there really an evolved capacity for number? Núñez, R., 2017. Trends in cognitive sciences.](#)

November 17: ANTHROPOGENY & CULTURAL EVOLUTION

Instructor: Pascal Gagneux

Learning Objectives: Contrasting Biological and Cultural evolution.

Reading:

[15. Anthropogeny. Gagneux. P., \(2021\) In: Saitou N. \(eds\) Evolution of the Human Genome II. Evolutionary Studies. Springer, Tokyo. https://doi.org/10.1007/978-4-431-56904-6\\_1.](https://doi.org/10.1007/978-4-431-56904-6_1)

[16.](#) The origins and psychology of human cooperation. J Henrich, M Muthukrishna. Annual Review of Psychology 72, 207-240

December 1: STUDENT PRESENTATIONS

Instructor: Pascal Gagneux & Student teams

Learning Objectives: Appreciate the common yearning for “umbrella” type hypotheses, focusing on a single factor to explain a large suite of human attributes. Student teams each pick one umbrella hypothesis and critique it for the class. Umbrella hypotheses include: Savannah Ape; Aquatic Ape; Machiavellian Ape, Handy Ape, Domesticated Ape; Warrior Ape; Religious Ape, Performative Ape, Cooking Ape, *Homo economicus* etc....

No Reading

Statement on Academic Integrity:

“Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating or any other forms of dishonesty will not be tolerated because they undermine learning and the University’s ability to certify students’ knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. So, think carefully before you act. Before you act ask yourself the following questions: a) is my action honest, fair, respectful, responsible & trustworthy and, b) is my action authorized by the instructor? If you are unsure, don’t ask a friend—ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at [academicintegrity.ucsd.edu](http://academicintegrity.ucsd.edu)”  
(Source: Tricia Bertram Gallant, Ph.D., UCSD Academic Integrity Office, 2017).