



DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

# ***Ancient foods, fiber, and bugs: Exploring the ancient human microbiome to understand human nutrition during evolution***

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(guest of Prof. P. Candela)

## **Abstract**

Humans have curious dietary proclivities with regard to their evolutionary history. Humans are the only ape to cultivate and process their food post extraction, and it is thought that these activities enable humans to develop and maintain a large metabolically expensive brain. Anthropologists take great interest in the activity of human food production, which is often contrasted with that of modern great apes in order to reconstruct the intervening 6 million years of evolution since the last common ancestor between humans and chimpanzees. Yet, observations of modern human hunter-gatherers demonstrate that extensive food processing is not essential for survival, and that although food processing technologies were developed thousands of years ago, these activities are not always incorporated into the food systems of various human societies. Notably, the Hadza hunter-gatherers of Tanzania subsist on a variety of wild foods including berries, tubers, baobab, honey, and wild game, and yet food processing in preparation for consumption is rare or situational, despite the high fiber content of their foods. The human digestive tract is not well suited to digesting large amounts of fiber, and there is an open question as to how much nutrition groups like the Hadza can obtain from their challenging high-fiber diet. The microbiota of the gut present one possible solution to this problem, and so investigations into the activity of the gut microbiota of the Hadza as well as other traditional human societies has provided anthropologists with a new framework for thinking about how ancient human societies subsisted in the absence of extensive food processing technology, and to revisit assumptions about what dietary components may be optimal for human health. In this presentation I talk about the role of plant foods in the human diet and its evolutionary legacy. In doing so, I present some of my earlier research on wild plants that came about from working with the Hadza and move on to demonstrate evidence for how the gut microbiome may facilitate nutritional acquisition. I end with more recent efforts to reconstruct the microbiome of ancient populations, the techniques used in the lab, and a discussion on the state of this research and what may be expected in the future.

## **Bio**

Stephanie Schnorr is a biological anthropologist who studies the role of diet and the gut microbiome in human evolution. Stephanie began this line of inquiry during her dissertation research at the Max Planck Institute for Evolutionary Anthropology by studying wild underground storage organs (or tubers) consumed by modern human hunter-gatherers, in which the microbiome plays a critical role. After her PhD, Stephanie moved to the University of Oklahoma to focus more specifically on microbiomes in anthropology at the Laboratories of Molecular Anthropology and Microbiome Research. While there, she used her post-doctoral time to research ancient



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microbiomes as well as the microbiome of edible termites, and has since moved on to complete a project in understanding how the microbiome may facilitate lipid metabolism for diverse hosts and ecosystems. This body of research is united under the goal of understanding how the human microbiome may be an adaptable system that tracks human environment and lifestyle, and how this may have impacted human dispersal and diversification during human evolution. Importantly, Stephanie, along with colleagues, works to promote joint efforts in anthropology and microbiology in order to tackle these questions.