Solving Crimes with the Necrobiome

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Abbreviated Film Guide
Educator Materials

OVERVIEW

Solving Crimes with the Necrobiome is one of 12 videos in the HHMI series *I Contain Multitudes*, which explores the fascinating powers of the microbiome: the world of bacteria, fungi, and other microbes that live on and within larger lifeforms, including ourselves.

This particular video focuses on the microbes associated with decomposing corpses, or cadavers. Following death, the microbiome of a body changes dramatically in composition. The community of organisms associated with a cadaver, which includes these microbes, is known as the necrobiome. In the video, Jessica Metcalf, an associate professor at Colorado State University, describes how she tracks changes in the necrobiomes in, on, and around the decaying bodies of dead animals, including humans, over time. She also explains how the predictable sequence of microbial communities associated with a cadaver can serve as a "microbial clock" for estimating time since death, providing useful knowledge for crime scene investigators.

Additional information related to pedagogy and implementation can be found on this resource's webpage, including suggested audience, estimated time, and curriculum connections.

KEY CONCEPTS

- Living organisms host a complex community of microbes called a microbiome, which is usually regulated by the host's immune system.
- Decomposition is mediated by microbes in predictable stages of ecological succession, which correspond to measurable and consistent changes in the microbial community.
- Decomposition is fundamental for cycling energy and nutrients in ecosystems.

PRIOR KNOWLEDGE

Students should have a basic understanding of:

- the role of microbes as decomposers
- how matter cycles between the living and nonliving parts of the environment
- what a microbiome is

KEY REFERENCE

Metcalf, Jessica L., Zhenjiang Zech Xu, Sophie Weiss, Simon Lax, Will Van Treuren, Embriette R. Hyde, Se Jin Song, et al. "Microbial community assembly and metabolic function during mammalian corpse decomposition." *Science* 351, 6269 (2016): 158–162. https://doi.org/10.1126/science.aad2646.