Science Fiction Meets Science Fact

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Ongoing Work on Fungal Infections and Renal Disease

Those with access to HBO may have seen the recent hit series “The Last of Us.” If you missed it, the plot is based on the presumption that fungi can cross host barriers and infect otherwise healthy human cardiovascular systems, turning people into zombies, and pushing humanity to extinction. The real-life organism chosen for this role is Cordyceps, a parasitic fungus with a unique and disturbing mechanism for host (often ant) infections. By all means, feel free to look into it … but be forewarned that it may seem a bit frightful!

It turns out that fungal infections actually do occur within our bodies, but surprisingly little is known about them. Along with our colleagues at the University of Tennessee Health Science Center in Memphis, we are trying to connect the dots between bloodstream fungal populations and end stage renal disease. A main goal is to apply modern combinatorial methods along with traditional statistical tools to uncover latent relationships between fungal and clinical variables so that medical professionals may have an opportunity to refine disease diagnosis and personalize patient treatment.

This is an exceedingly difficult problem, in large part because graph theoretical methods rely on edge weights, which in turn depend on pairwise correlations, and these have thus far suffered from a lack of both baseline and temporal data. Nevertheless, we are optimistic that meaningful results can be found as more data comes online. Our efforts have been orchestrated by Tyson Beach, working alongside other Langston Lab regulars including Cheng Chen, Levi Dojcsak, Stephen Grady, Daniel Mishler, and Haoran Niu.

Potential dangers posed by fungi remain a popular topic in the entertainment industry. HBO has confirmed that Season 2 of “The Last of Us” is set to debut in 2025. Of course, this is merely science fiction. Cordyceps can’t really survive in humans or vertebrates of any sort. At least as far as we know. And unless they adapt…