

# Linking microbial sex and virulence

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Two opportunistic pathogens that were once thought to be very different have evolved some sexual reproduction and disease-causing habits that are not only similar but also suggest that in the microbial world sex and virulence are closely linked, according to a review published this week in the online journal *mBio*.

"Although the mechanisms used by bacterial and [fungal species](#) to promote genetic exchange are distinct, recent studies have uncovered surprising parallels between pheromone signaling in these species," says Richard Bennett of Brown University who co-authored the article with Gary Dunny of the University of Minnesota.

[Sexual reproduction](#) in bacteria involves the joining of two parent cells and the exchange of genetic materials. In sexual reproduction, the offspring will have a mixture of the parent cells' traits. Most bacteria reproduce asexually by simple cell division so that the newly formed cells carry the exact [genetic makeup](#) of the original cells.

Bennett's primary area of research is focused on understanding the sexual [reproductive cycle](#) of the opportunistic human pathogen *Candida albicans*, a yeast that generally grows harmlessly in the human digestive tract but under certain circumstances can cause disease. Dunny studies genetic transfer and virulence in *Enterococcus faecalis*, a bacterium that, like *C. albicans*, is a common component of the digestive tract but can also cause life-threatening opportunistic infections.

Telesensing, or probing of the environment by releasing chemical

messengers such as pheromones, plays a central role in the sexual reproduction of microorganisms. In the review Bennett and Dunny examine recent evidence that indicates that these two very different microorganisms actually show similar modes of pheromone signaling to regulate the exchange of genetic material. More importantly, they make the connection to evidence that shows these same mechanisms can be used by the pathogens to cause disease.

"It is now apparent that pheromone signaling not only controls sexual reproduction and genetic exchange but can also activate expression of potential [virulence](#) factors in diverse opportunistic pathogens," say the authors. "It will therefore prove revealing to determine whether other microbes have adapted their mating machinery for novel purposes, with particular emphasis on the role of these processes in opportunistic pathogens that colonize and infect the human host."

**More information:** [mbio.asm.org/content/1/4/e00181-10](https://mbio.asm.org/content/1/4/e00181-10)

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