

How Wolbachia bacteria controls vectors of deadly diseases

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Researchers at Boston University have made discoveries that provide the foundation towards novel approaches to control insects that transmit deadly diseases such as dengue fever and malaria through their study of the *Wolbachia* bacteria. Their findings have been published in the current issue of *Science Express*.

"*Wolbachia* are widespread, maternally-transmitted intracellular bacteria that infect most insect species and are able to alter the reproduction of innumerable hosts," said Horacio Frydman, assistant professor of biology at Boston University and the study's principal investigator. "An important aspect of this relationship is that *Wolbachia* often alter their host's reproductive ability, yet very little is known about how this is achieved." In this paper, PhD student Eva Fast and her colleagues in the Frydman lab describe a study in *Drosophila mauritiana* that offers insights into the [cellular mechanisms](#) through which *Wolbachia* upregulates [egg production](#) by their hosts.

Specifically, the BU team demonstrate that *Wolbachia* in *D. mauritiana* have a remarkable tropism for terminal filament and cap cells in the female germline stem cell (GSC) niche (and a similar tropism in hub cells, the male GSC niche). They also show through extensive analysis of proliferation and cell death markers in multiple experiments that infected *D. mauritiana* have higher rates of GSC division and lower rates of germline cyst death in the germarium relative to uninfected counterparts. Finally, they provide compelling evidence suggesting that *Wolbachia* affects GSC division through effects on the niche. "Knowledge emerging from this research will be relevant for the basic [stem cell biology](#) as well for the development of cell biological strategies for disease control," said Frydman.

Provided by Boston University Medical Center

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