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# Wolbachia interactions with its filarial nematode host: transmission mechanisms and roles of the symbiont.

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## Résumé

Wolbachia are gram-negative, obligate, intracellular bacteria carried by millions of arthropods worldwide. Wolbachia are also symbiotic with filarial nematodes, but exclusively with members of the parasitic Onchocercidae family. Wolbachia are transmitted vertically through the female germline, similar to mitochondria. In nematodes, the Wolbachia-host symbiosis has evolved toward mutualism and bacteria removal interferes with worm development and eventually leads to nematode death.

Filarial nematodes are causative agents of devastating diseases such as elephantiasis and river blindness. These diseases affect ~120 million people in tropical areas. There is currently no drug treatment against adult filarial nematodes. Because Wolbachia is essential to adult worm survival and fertility, Wolbachia is a promising drug target. Using *Brugia malayi* as a filarial model, a causative agent of elephantiasis, we are focusing on two fundamental aspects of this symbiosis :

- the mechanisms of Wolbachia transmission, from the fertilized egg to the adult tissues.

- the role and contribution of symbionts to the filarial host.

Using cell biology techniques we designed for studying these parasitic worms, we show that Wolbachia asymmetrically segregate during embryogenesis to reach only the hypodermis of the worm, and an ovarian tropism allows the symbionts in the hypodermis to colonize the adult female germline. We will present the defects induced during oogenesis and embryogenesis in the absence of Wolbachia.

**Mots-Clés:** Filariasis, Wolbachia, symbiosis, nematode, bacteria

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