

# SUSCEPTIBILITY OF *WOLBACHIA*, AN ENDOSYMBIONT OF *BRUGIA MALAYI* MICROFILARIAE, TO DOXYCYCLINE DETERMINED BY QUANTITATIVE PCR ASSAY

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**Abstract.** Lymphatic filariasis, caused by filarial nematodes, is a mosquito-borne disease that affects over 120 million people in the tropics and subtropics. The disease is caused mainly by *Wuchereria bancrofti* and *Brugia malayi*. Fertile adult female worms release offsprings (microfilariae) into the host blood circulatory system. Transmission-blocking agents as well as antimicrobial agents have been used to reduce microfilarial density in human and animal reservoir hosts. Doxycycline and rifampicin have an effect on the obligate intracellular gram-negative bacteria, *Wolbachia*, which appears to exert an influence on filarial nematode embryonic and larval development, adult female fertility, and filarial survival. We investigated the effects of doxycycline, rifampicin and ciprofloxacin on *B. malayi* microfilarial motility, expressed as minimum effective concentration (MEC), and on *Wolbachia* proliferation using quantitative PCR, expressed as the concentration of the drug to inhibit bacteria growth by 50% (IC<sub>50</sub>). MEC of doxycycline was 128 and 32 g/ml at 12 and 52 hours, respectively, but rifampicin and ciprofloxacin were ineffective (MEC >256 g/ml). IC<sub>50</sub> of doxycycline was 32 and 2 g/ml at 12 and 52 hours, but this for rifampicin (8 g/ml) and ciprofloxacin (32 g/ml) were obtained only after 52 hour treatment. Thus, MEC and IC<sub>50</sub> assay methods used in this study could be applied to screen other agents targeting filariae and their endosymbiont bacteria.

**Keywords:** *Wolbachia*, microfilaria, minimum effective concentration, IC<sub>50</sub>, qPCR

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