

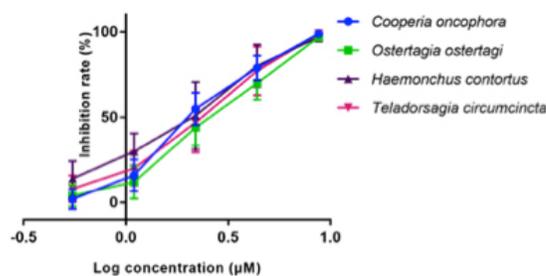
WMICROTRACKER VALIDATED FOR LIBRARY SCREENING AND DRUG DISCOVERY IN PARASITIC NEMATODES

“Most motility assays of anthelmintic activity for parasitic nematodes are laborious and low throughput, and therefore not suitable for screening large compound libraries.....using a wMicroTracker instrument (with parasitic nematodes), we established a practical, automated and low-cost whole-organism motility assay and screened a repurposing library to discover novel candidate anthelmintics.” Liu et al. (2019)

Motility assays are widely used to screen libraries for drug candidates. Automated quantification of motility typically involves optical identification of worm profiles, requiring a microscope, camera and image-recognition software. The wMicroTracker platform makes collecting and analyzing worm motility data faster, cheaper and simpler, by eliminating optical imaging. Instead, motility is quantified by counting how often infrared microbeams are interrupted by worm movements. wMicroTracker is well validated with *C. elegans* (learn more at <https://nemamatrix.com/wmicrotracker/>), but what about parasitic nematodes?

In a groundbreaking study, Liu et al. (2019) used the wMicroTracker with a ruminant parasite, *Cooperia oncophora*, to efficiently screen a library of almost 3000 compounds for potential repurposing as anthelmintics. *C. oncophora* larvae were placed in the wMicroTracker in 96-well microplates, the wMicroTracker was placed in an incubator (to maintain the worms' environment), and worm motility in each well was quantified every 30 min, for 3 hrs. The wMicroTracker motility screen successfully identified known anthelmintics in the library (= positive controls) as well as identifying four novel hits. Concentration-response curves and EC50 values for motility inhibition were derived for the four candidate compounds, using *C. oncophora* in the wMicroTracker.

Furthermore, anthelmintic bioactivity was confirmed in three additional parasites: *Ostertagia ostertagi*, *Haemonchus contortus* and *Teladorsagia circumcincta* using the wMicroTracker motility assay. One of the novel hits (EVP4593) shows particular promise as a new anthelmintic.



The concentration-response curve of EVP4593 on four ruminant parasites (mean ± S.D., n = 3). (Liu et al. 2018)

This study validates the use of wMicroTracker motility assays to screen a large drug library on parasitic nematodes. Liu et al. (2019) limited their study to gastrointestinal parasites of ruminants, but wMicroTracker motility assays can be applied to many other nematode species. This platform may also prove useful for parasitic trematodes such as *Schistosoma* spp, and other small organisms such as zebrafish.

References:

Liu M., Landuyt B., Klaassen H., Geldhof P., Luyten W. (2019) Screening of a drug repurposing library with a nematode motility assay identifies promising anthelmintic hits against *Cooperia oncophora* and other ruminant parasites. *Veterinary Parasitology* 265:15-18

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