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://nemametrix.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.

References: