

***In vitro* Bioassay for Ectoparasite Repellents**

Opportunity offered:

- R&D Collaboration
- Screening service

Intellectual Property:

Method and Know-how

Description of the Assay

□ Background

Increasing public awareness of the severity of tick-borne diseases such as Lyme borreliosis and tick-borne encephalitis has fuelled the number of new tick repellent products entering the market. However, to date no standardised and reliable screening method exists for initial efficacy testing in a situation that mimics tick responses on the host. The novel bioassay described herein addresses this need and allows for rapid identification of effective tick repellent products.

□ Test Principles

- Ticks climb onto hosts by responding to body heat and other host stimuli. Ticks will equally climb on an artificial warm surface mimicking the warm-blooded host. This forms the basis of the *in vitro* assay.
- Once a tick has engaged with a human host it climbs up in search of a predilection site to feed (negative geotaxis). Tick repellents interfere with this innate behaviour and cause ticks to drop off or climb down the host (positive geotaxis).

□ Development status

- Optimised warm body device that mimics the behavioural responses of ticks on hosts
- Predictive and reproducible quantitative method to evaluate the geotactic behaviours of ticks in response to repellents
- The *in vitro* assay reproduces closely the responses of ticks to repellents *in vivo* (human leg assay)

□ Main advantages / Partnership potential

- ✓ low cost and scalable test system
- ✓ suitable for fast and reliable identification of leads from a compound library
- ✓ suitable for dose range analyses
- ✓ suitable for testing new compounds of unknown toxicity and dermatological effects
- ✓ tests can be customized
- ✓ know-how to develop further assays for other ectoparasites

□ Potential application

- For large scale screening of repellent compounds targeting ticks and other ectoparasites

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