A high-throughput electronic device for screening the biomembrane activity of pharmaceutical compounds

CRACK IT Solutions

We are seeking collaborators to help extend the utility of our novel, high-throughput device for assessing biomembrane toxicity of chemicals.

What could your solution be used for?

The technology can be used for high-throughput screening of chemicals and/or nanoparticles for their biomembrane activity and rapidly reports on the nature and mechanism of the activity and its kinetics. A full performance portfolio on the screening of a wide range of pharmaceutical compounds, toxins, polymers and nanoparticles has been developed.

The device has applications in any area associated with toxin screening such as drinking water monitoring and air screening for security purposes. The technology has already been successfully used to screen engineered nanoparticles for their biomembrane activity.

Need for collaboration

We would like to develop the device as a more sophisticated tool for chemical/pharmaceutical screening and drug discovery. We would like to know

- What parameters are of significance regarding biomembrane activity;
- What particular structural features of a molecule are of interest with respect to its interaction with a biomembrane;
- What are the performance specifications required of the device.

We are seeking collaborations with partners able to provide novel reagents or compounds with preclinical/clinical data available to test in the model thus enlarging the technology's performance portfolio

3Rs impact assessment

The technology provides a reliable means to identify potential membrane toxicants (including mitochondrial toxicity) earlier in drug development, potentially reducing the number of compounds entering animal studies that are destined to fail because of inappropriate biomembrane absorption and toxicity.

Membrane toxicity and membrane damage feature in many examples of drug-induced toxicity, such as drug-induced phospholipidosis in the liver and kidney. Drug-induced organ toxicity accounts for 30% of all drugs that fail prior to reaching the market. Applied to the kidney as target; nephrotoxicity accounts for 2% of failures in the preclinical stages and 19% of all failures in Phase III. A screening technique which eliminates candidates that are potentially biomembrane toxic at a preliminary stage may improve drug development and reduce animal use.

To find out more or to connect with the technology developer contact crackitenquiries@nc3rs.org.uk

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