High Throughput Measurement of Mitochondrial Membrane Potential

Mitochondrion is a well known drug toxicity target. Mitochondrial toxicity may relate to drug adverse effects and drug attrition, being the loss of membrane potential an early mark of apoptosis. Therefore, detection of chemical compounds-induced changes in mitochondrial membrane potential (mMP) is a very useful tool for early detection of toxicity that would help to select safer compounds.

Moreover, mitocohondrion is also a promising therapeutic target for infectious diseases neurodegeneration, cancer, apoplexy, diabetes, etc. so detection of mMP changes would also be valuable for early drug discovery.

The availability of fluorescent dyes responding to those membrane potential changes has enabled us to design an assay to detect variations in mMP of isolated mitochondria from HEK293 cell cultures by monitoring changes in fluorescence intensity.

The quality of the assay is excellent as validated with known uncoupling agents, with a dynamyc range of more than three orders of magnitude. The assay is easy, homogeneous, fast, miniaturizable and low cost, which allows its transition to high throughput screening platforms.

Note: "The human biological samples were sourced ethically and their research use was in accord with the terms of the informed consents"