

Development of a novel SPR based technique as means to study bio-recognition processes in living cells (Yissum)

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- **Monitors dynamic interactions without cell disruption**

Categories	Research/development tools, Diagnostics, Imaging
Development Stage	Prototype
Patent Status	United States patent application filed
Market	Potential users are big pharma R&D groups, academic research laboratories and diagnostic units in hospitals

Highlights

- New monitoring method for studying dynamic processes in living cells without the use of fluorescent, radioactive or other chemical labels that may alter physiological activity
- IR-based SPR enables research such as measurement of concentrations of glucose in red blood cells, real-time study of lipid membranes of cells cultured on gold films and drug and protein penetration into cells,.
- Main results: Cell morphology changes upon interaction with drugs; human melanoma cells MEL1106, A431 cells, MDCK cells, HeLa cells, Ferrotransferrin injection
- Applications in single-cell-based diagnosis of human pathological conditions and for profiling custom tailored targeted therapies

Our Innovation

Surface plasmon resonance (SPR), wave-guide modes, and a Fourier-transform-infrared spectrometer (FTIR) are employed in a new optical tool for studying real-time changes inside and on the surface of living cells. The observation of wave-guide modes in live cell monolayer film is possible because the infra-red wavelength is of the order of the cell height. The guided modes provide information on the cell morphology.

Key Features

- Direct observations of biological interactions in the living cell, enabling observation of interactions not previously detectable.
- Enables continuous follow up of intracellular dynamic events without the need to label the interacting molecules or to kill the studied cells.
- Useful for the detection of bio-molecules in living cells based on their spectral fingerprints (not possible in the visible range)
- Cells do not suffer photo damage or photo toxicity induced by IR radiation

Development Milestones

Seeking funding for ongoing development, industry collaboration for development of various applications

The Opportunity

- Biochemical and cell based drug discovery applications
- The system offers developers the ability to evaluate promising new drug candidates and targets.
- Tool for future drug discovery and advanced diagnostic methods

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