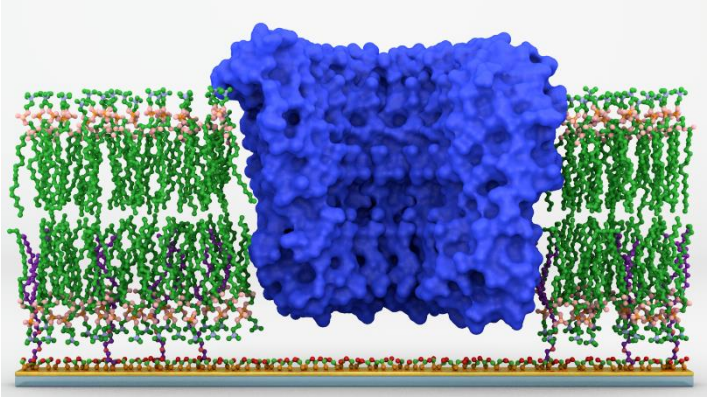
Enabling technology platform to study proteins in membranes

Vilnius University

Brief description of a technology

The variety of tools to mimic a biological membrane as a functional barrier in fundamental research and biotechnological application are available. One of them – tethered bilayer lipid membranes (tBLM) – is the most relevant model with a controllable sub-membrane reservoir. Our technology based on anchoring of lipid-like compounds, enables the production of the stable artificial lipid membranes in a quicker and convenient way. This platform is more suitable for electrochemical approach while also mimics a cell plasma membrane in *in vitro* experiments better.



Proposal

A broad spectrum of tBLM architecture allows to mimic different cell membranes (blood cells, neurons, bacterial, etc.) or investigate particular biological/biochemical processes in various biological fluids such as blood, urine or saliva.

Fields of application

The tBLM-based biosensoric system might be utilized in point of care diagnostics, drug discovery and other pharmaceutical research.

Technology readiness

Technology development (4 level) – components and breadboard validation in laboratory environment.

Intellectual property

Patent: LT2015 080.
Applicant: Vilnius University.

Inventors

Dr. Gintaras Valinčius, electrochemistry impedance spectroscopy method development; dr. Rima Budvytytė, misfolded proteins in neurodegenerative disease development; dr. Tadas Ragaliauskas, lipid membrane models development; dr. Marija Jankunec, visualisation and nanomechanical properties of proteins interaction with lipid bilayer by AFM; PhD student Tadas Penkauskas, practical and theoretical development of lipid–based EIS biosensor.

Relevant publications

Ragaliauskas et al. (2017) *Biochim Biophys Acta Biomembr.*, 2017, 1859(5):669-678
Ragaliauskas et al. (2019) *Sci Rep.,* 2019, 9(1):10606

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