Biography

Jolanta Vidugiriene is a Group Leader in R&D at Promega leading development of new technologies for mechanistic studies of cell survival and adaptation, particularly those involved in regulation of cellular energy metabolism.

Prior to joining Promega, Jolanta was a Principal Investigator of a Howard Hughes International Grant, where she conducted collaborative research between the Department of Biochemistry, University of Wisconsin-Madison and Vilnius University, Lithuania. Jolanta received her Ph.D. in biochemistry from Vilnius University, completed post-doctoral studies at Boston Biomedical Research Institute and Laboratory of Molecular Parasitology, Rockefeller University.

Abstract

The growing trend towards understanding the role of cell metabolism in cancer, immunology, obesity, diabetes, and neurodegenerative disease has presented specific challenges in developing rapid and reliable methods for measuring the changes in metabolic pathways. In this seminar, I will introduce luminescence metabolite detection assays (e.g. glucose uptake, glucose, lactate, glutamate, NAD(P)/NAD(P)H detection) and provide examples of using those assays for studying changes in metabolic pathways of cancer cells, monitoring activation of T cells or evaluating insulin sensitivity in primary adipocytes. I also will discuss the advantages of incorporating real time viability measurements in metabolite detection workflow and multiplexing different assay chemistries for obtaining more information from the same set of samples.

1. Cell viability and toxicity assays

Developed RealTime Viability Assay for measuring changes in viability in real time in live cells. Working on bioluminescent LDH release assay. The assay allows repeated measurements from the same sample and has been validated in 3D cultures/micro tissues as well as for ADC/ADCC applications.

2. Bioluminescent Metabolite assays

NAD(P)/NAD(P)H-Glo Assays – have been launched; Developed protocols for HTS applications as well as measuring total and individual (oxidized and reduced forms) dinucleotides in different cell types and tissues.

Glucose uptake assay – have been launched; Developed protocols and tested for measuring changes in glucose uptake under different growth conditions (hypoxia), in response to changes in signaling pathways, screening/evaluating glucose uptake inhibitors or measuring insulin sensitivity.

Glucose, lactate, glutamine, glutamate assays – have been launched; Developed protocols and tested for measuring changes in metabolite levels under different growth or treatment conditions in mammalian cells and tissues.

Lipolysis and lipogenesis assays – early technology development stage; no samples are available for testing but interested in getting customer input for the need of such assays or other lipid metabolism assays.

3. Cholesterol/PCSK9 targeting assays

Multiple assays are in development for studying LDL receptor/PCSK9 biology: 1)Cell-based LDLR and PCSK9 interaction assays using NanoBiT technology, 2) PCSK9 secretion assay using NanoBiT technology, 3) Bioluminescence LDL uptake assay.