Case Study 1

Post-Translational Modification and COVID-19 Infection (PMID: 35858407)

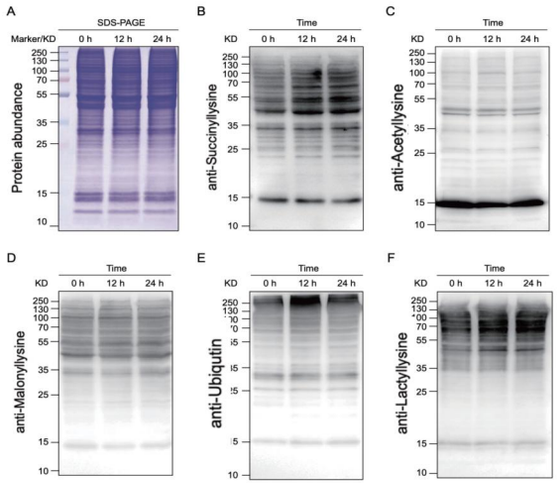
Application Strategy: Analyzing Changes in General Protein Post-Translational Modification Levels Using Western Blot

PNAS RESEARCH ARTICLE | MICROBIOLOGY OPEN ACCESS

The global succinylation of SARS-CoV-2–infected host cells reveals drug targets

Research Scenario |

Post-translational modification (PTM) is a focal point in the investigation of mechanisms underlying infectious diseases and the discovery of drug targets. To explore the impact of early SARS-CoV-2 infection on host PTMs, researchers examined changes in PTM levels within cells subsequent to SARS-CoV-2 infection. The results revealed a significant upregulation of protein succinylation at the early stage of infection, exhibiting a positive correlation with the viral infection period.



Antibodies Cited

PTM-101 (Kac Mouse mAb) | PTM-105 (Kac Rabbit pAb) | PTM-401 (Ksu Rabbit pAb) | PTM-901 (Kmal Rabbit pAb) | PTM-1105 (Ubi Rabbit pAb)

Case Study 2

Post-Translational Modification and Systemic Lupus Erythematosus (PMID: 34384544)

Application Strategy: Assessing the Post-Translational Modification Profile of a Target Protein through Immunoprecipitation Coupled with Immunoblotting (IP/IB)

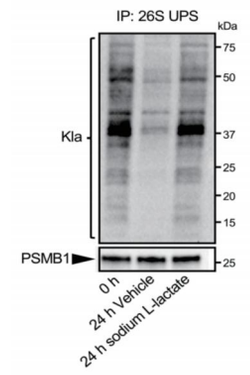
CellPress Cell

Article

Erythroid mitochondrial retention triggers myeloid-dependent type I interferon in human SLE

Research Scenario |

In patients with systemic lupus erythematosus (SLE), red blood cell mitochondria exhibit resistance to degradation, a marked departure from the normal degradation process observed in healthy individuals during cellular maturation. This degradation is dependent on the continuous enhancement of ubiquitin-proteasome system (UPS) activity, which is found to be meticulously regulated through lactylation modification. As cells progress through maturation, there is a notable decline in the prevalence of lactylation modification, leading to a pronounced upregulation of UPS activity and subsequent mitochondrial degradation.



Antibodies Cited: PTM-1401RM (Kla Rabbit mAb)

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PTM Type	PTM Functions	Selected Products
HOT Lactylation First reported in *Nature* in 2019	Closely related to glycolysis and mitochondrial oxidative metabolism, regulating processes such as tumorigenesis, inflammation, metabolism, and hypoxia stress.	PTM-1401RM
HOT Succinylation First reported in 2012	Extensively involved in metabolic regulation. Succinylation modification impacts numerous central metabolic enzymes, and is intricately linked with diseases such as cancer, cardiovascular diseases, and inflammation.	PTM-401, PTM-419
HOT Crotonylation First reported in *Cell* in 2011	Regulates gene expression, stem cell differentiation, reproductive development, tumor metabolism, DNA damage repair, and more.	PTM-501, PTM-502
HOT β-Hydroxybutyrylation First reported in 2016	Closely linked to core cellular metabolism such as fatty acid oxidation, influencing the regulation of cell energy metabolism, DNA damage repair, and tumorigenesis.	PTM-1201RM
HOT 2-Hydroxyisobutyrylation First reported in 2014	Associated with processes like amino acid synthesis and glycolysis, participating in gene expression regulation, germ cell differentiation, and plant pathogenicity.	PTM-801, PTM-802
HOT Phosphorylation Classic PTM	Regulates enzyme-catalyzed reactions, receptor binding activity, and plays a key role in signal transduction, development, differentiation, cancer development, and stress responses.	PTM-702RM (Tyr), PTM-705RM (Thr)
HOT Methylation Classic PTM	Modulates cancer, aging, neurodegenerative diseases, and other processes through the modulation of gene expression, protein function, RNA processing, and other epigenetic mechanisms.	PTM-602 (Kme1/2), PTM-606 (Kme2) PTM-601 (Kme3)
HOT Acetylation Classic PTM	Affects chromatin structure and gene expression, participating in the regulation of epigenetics, signal transduction, metabolic regulation, immune responses, tumorigenesis, apoptosis, and other biological processes.	PTM-105RM, PTM-101
N-Acetylation	Regulates protein stability, protein interactions, and membrane binding, with a significant role in cellular autophagy.	PTM-1601
Malonylation First reported in 2012	Involved in the regulation of cellular energy metabolism, metabolic disorders, immune regulation, plant stress resistance, and other biological processes.	PTM-901, PTM-902
Benzoylation First reported in 2018	Participates in the regulation of signaling pathways, hormone secretion, epigenetics, metabolic regulation, and other biological processes.	PTM-762
Glutarylation First reported in 2014	Involved in nucleosome assembly, gene expression, DNA damage repair, cell cycle, and other chromatin-related functions.	PTM-1151, PTM-1152
Propionylation First reported in 2007	Affects chromatin structure and gene expression, participating in the regulation of epigenetics, signal transduction, and metabolic regulation.	PTM-201, PTM-203
Butyrylation First reported in 2007	Plays a role in gene expression, participating in the regulation of epigenetics, signal transduction, and plant stress responses.	PTM-301RM, PTM-329
NEW Methacrylation First reported in 2021	Isomeric with crotonylation modification, with potential regulatory functions in epigenetics and cellular detoxification, and may be associated with neurological and liver diseases.	PTM-1501
Carboxyethylation	Involved in the regulation of oxidative damage and associated with various diseases such as atherosclerosis, diabetes, uremia, heart failure, and neurodegenerative diseases.	PTM-1701RM
O-linked Glycosylation Classic PTM	Significant impact on protein folding, conformation, distribution, stability, and activity, regulating multiple signaling pathways controlling hormone responses, cellular stress, metabolic diseases, and tumor development.	PTM-951RM, PTM-952
HOT Ubiquitination Classic PTM	Mediates protein degradation, altering protein subcellular localization and activity, participating in the regulation of cell cycle, apoptosis, aging, neurodegenerative diseases.	PTM-1107
SUMOylation	Involved in protein-protein and protein-DNA interactions, and participates in the regulation of diseases including cardiovascular diseases, cancer, neurodegenerative diseases, and immune-related diseases.	PTM-1109