"Phospho-Totum"
Phosphorylation Analysis Platform

SOCIUM

Comprehensive intracellular phosphorylation measurement and seamless measurement data analysis software

Comprehensive intracellular phosphorylation measurement

✓	Protein arrays with 1492 human recombinant proteins	• 845 proteins comprising 293 phosphorylation pathways • 816 substrate proteins of 190 protein kinases
✓	Extracts from cells/tissues under diverse environmental conditions were used as samples.	• Mimic intracellular phosphorylation by kinases on the array • Simultaneous measurement of on/off targets
✓	Quantitative measurement of phosphate groups of all protein structures with general-purpose reagents	• Detect phosphorylation by Tyr kinase and Ser/Thr kinase and is not limited to known pockets

Measurement data analysis software

Extract the following information from the data of a single measurement

✓	Extraction of phosphorylation substrate specific to the measurement conditions (Patent number 6356015)	
✓	Quantitative estimation of phosphorylation pathway activation level (BMC Sys. Biol. 2, 84, 2008)	Estimation of global On/Off pathway for each measurement condition
✓	Visualization of activated phosphorylation pathways	Intuitive understanding of phosphorylation status
✓	Quantitative estimation of kinase activity level (Journal of Biomedical Research.38, 195-205, 2024)	Estimation of On/Off target kinase for each measurement condition (inhibitor)

Features of Phospho-Totum (differentiation from other methods)

	"Phospho-Totum".	Modalities of other companies
Equipped with	Total proteins (kinases and substrates)	Subparts (peptides or specified antibody molecules)
Proteins to be measured	Protein	Residue (part of protein)
Measurement environment	Cellular environment (many-to-many kinase and target molecule)	Population environment (1 : 1 for kinase and target molecule)
Estimation Target	On/Off target protein/pathway	On target residue
Number of measurements	1 time	Multiple times

Major Applications of Phospho-Totum

Global understanding of intracellular phosphorylation status	Importance of understanding the activation state of the entire phosphorylation pathway (Review of Phospho-Totum)	Journal of Biomedical Research. 38, 195-205, 2024
Visualization of signal transduction by external stimuli	Visualization of signal transduction by stimulation and inhibition using the EGF pathway as an example (Joint research with AIST)	Proteomics, 21(16):e2000251, 2021
Elucidation of the mechanism of anticancer drug resistance: Estimation of bypass molecules	Mechanism of osimertinib resistance (Collaborative work with Keio University)	Mol. Cancer Res. 549-559, 18, 2020
Estimation of Target Molecules of Novel Compounds	Prediction of target kinases of novel synthetic compounds / Inhibition by binding in non-known pockets (collaboration with Nanjing Medical University)	Journal of Medicinal Chemistry. 66(21): 14609-14622, 2023/ Ongoing
Elucidation of the mechanism of drugs with different effects	Differential risk mechanisms of hepatocellular carcinoma development between two drugs administered to patients with chronic hepatitis B (Joint research with Kanazawa University)	Hepatology Communications 8(1):e0351, 2024
Elucidation of the mechanism of synergistic effect of two drugs in combination	Mechanisms of the Combination Effects of Kinase Inhibitors and MCL-1 Antagonists in Acute Myelogenous Leukemia (collaboration with Virginia Commonwealth University)	Signal Transduction and Targeted Therapy, 10:50, 2025/ Ongoing
Phosphorylation state by phosphatase Alteration	Effects of mutant phosphatases on phosphorylation (Collaborative research with Columbia University)	Ongoing
Estimation of Off-targets of ALK inhibitors	Estimation of Off-target kinases of 5 ALK inhibitors on the market and their relationship with inhibitor side effects (Collaborative study with Saitama Medical University)	Proceedings of the AACR (in press)/ Ongoing

Service Flow

Step 1	Contact to SOCIUM Inc. or our agency in US or China (See below)
Step 2	Meeting to plan the analysis (NDA can be signed in advance upon request)
Step 3	SOCIUM submits the analysis plan to the client **(2 weeks from Step 2 to Step 3)**
Step 4	Contract for the analysis plan and its cost is signed.
Step 5	Preparation of samples and payment of costs at the client's laboratory
Step 6	SOCIUM receives the samples and analyzes them
Step 7	SOCIUM submits analysis report **(1 month from Step 6 to Step 7)**
Step 8	Review of analytical report

Contact to

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