Define the isoform-specific substates of protein kinase MEK1 and MEK2

蛋白激酶 MEK1 和 MEK2 異構體特異底物的研究

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With the support from the Tung Centre, we have made significant progresses in establishing novel proteomic pipelines for identifying disease targets and biomarkers. We established a bioorthogonal conjugation-assisted purification (BCAP) workflow that utilizes the Staudinger chemoselective ligation to label and isolate surface-associated proteins while minimizing the binding of endogenous biotin-associated proteins. We applied this method and successfully identified new markers of senescent cells (Analytical Chemistry #1). Moreover, we designed a β-gal-activated probe, MB-βgal, based on the methylene blue (MB) fluorophore, to detect and eliminate senescent cells (Analytical Chemistry #2). Moreover, we also established a set of "cysteine-reactive sulfonium-based (C-Sul)" probes, which form the basis of a low-toxicity method for proteomic profiling reactive cysteines in live cells (Analytical Chemistry #3). Finally, we established a technical pipeline that uses as little as 20 ul of serum to effectively explore the immnuoglobulin-associated proteome (IgAP) (Journal of Proteomics). These tools will facilitate biomarker development and the IgAP pipeline has been filed for a new patent application in China.