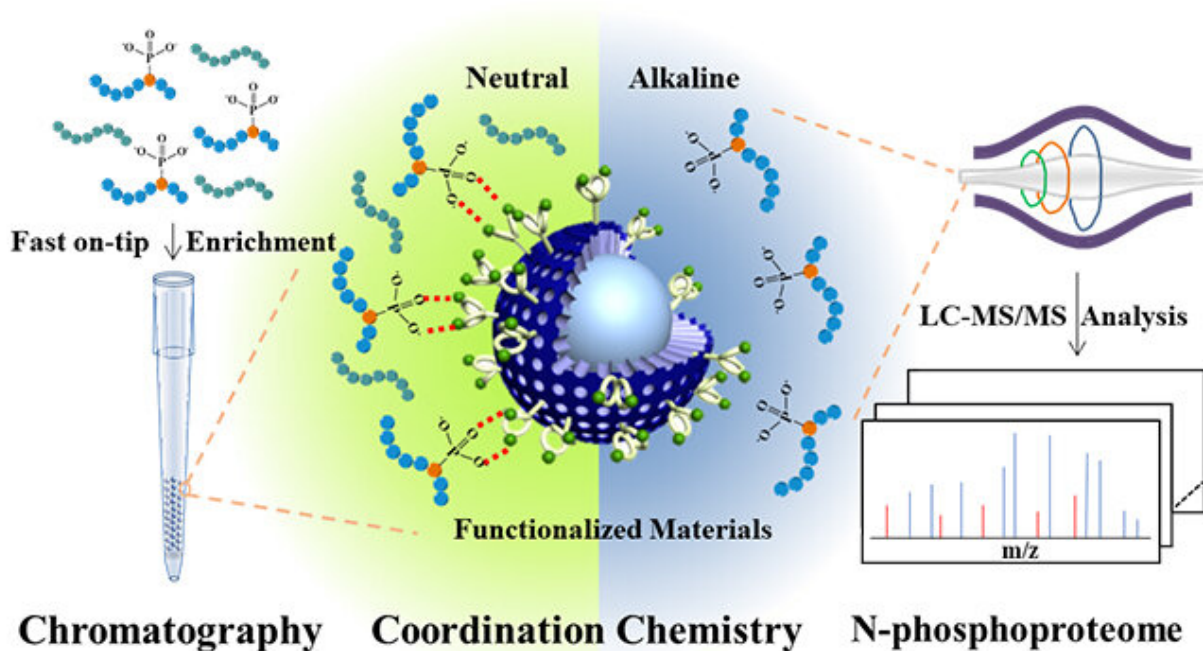


Researchers tailor rapid and effective N-phosphopeptides enrichment strategy

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Bis(zinc(II)-dipicolylamine)-functionalized sub-2 μm core-shell microspheres for the analysis of N-phosphoproteome. Credit: JIANG Bo and HU Yechen

Protein N-phosphorylation plays a critical role in central metabolism and two/multicomponent signaling of prokaryotes. Furthermore, it exists as intermediates of some important enzymes in mammals.

However, the current enrichment methods for O-phosphopeptides are not preferred for N-phosphopeptides due to the intrinsic lability of P-N bond under acidic conditions. Therefore, the effective N-phosphoproteome analysis remains challenging.

Recently, a research group led by Prof. Zhang Lihua and Pro. Zhang Yukui from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences (CAS) proposed a rapid and effective N-phosphopeptides enrichment strategy.

Their study was published in *Nature Communications* on Dec. 4.

Inspired by naturally occurring phosphatases, which provide specific Zn(II)-central enzymatic pockets to bind phosphate units of substrates, the researchers designed bis(zinc(II)-dipicolylamine) molecular (DpaZn) for phosphate targets recognition under neutral conditions.

Combing the fast mass transfer ability of sub-2 μm core-shell silica microspheres, DpaZn-functionalized sub-2 μm core-shell silica microspheres ($\text{SiO}_2\text{@DpaZn}$) were designed for on-tip N-phosphopeptides enrichment under neutral conditions. In total, 3,384 N-pho sites, containing 611 pHis, 1618 pLys and 1155 pArg, were identified from HeLa cell lysates.

The new N-phosphorylated proteome analysis method provides not only basic data for in-depth study of its biological function, but also technical support for promoting the development of precision medicine, synthetic biology and other fields.

More information: Yechen Hu et al.

Bis(zinc(II)-dipicolylamine)-functionalized sub-2 μm core-shell microspheres for the analysis of N-phosphoproteome, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-20026-1](https://doi.org/10.1038/s41467-020-20026-1)

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