

Biological Sciences Division

Researchers develop improved protein affinity probe

PNNL scientists have developed a multi-use affinity probe for proteins that has improved properties compared to the parent compound. The new probe, CrAsH, which stands for carboxy-FIAsH (CrAsH-EDT2), is a tetracysteine-binding probe used to identify and validate protein interaction networks. CrAsH is cell permeable and, upon association with a specific tag encoded into a protein of interest, becomes highly fluorescent, enabling researchers to track cellular location and binding interactions.



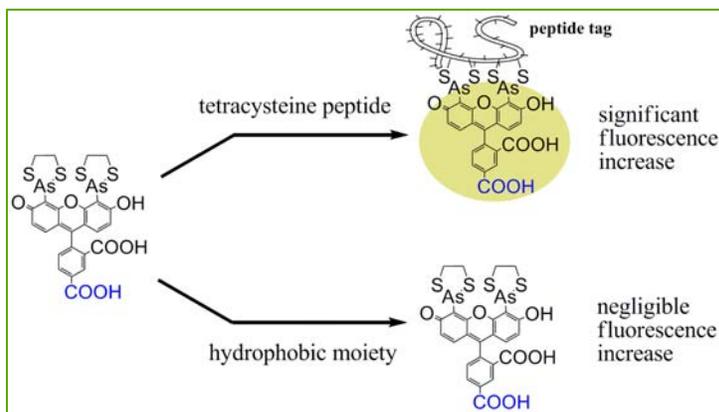
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The parent compound, FIAsH (for Fluorescein Arsenical Helix binder) bound nonspecifically to “greasy” structures, such as membranes and hydrophobic pockets of proteins, and gave a large background signal that made it unusable for most cells. The new CrAsH probe has minimal sensitivity to such structures and is therefore useful for live-cell imaging.

The work was done by Haishi Cao, Baowei Chen, Tom Squier, and Uljana Mayer for the U.S. Department of Energy’s Office of Biological and Environmental Research’s Genomics: GTL program. The results appeared as an advance article in *Chemical Communications*, a publication of the Royal Society of Chemistry.

Reference

Cao H, B Chen, TC Squier, and MU Mayer. 2006. “CrAsH: a biarsenical multi-use affinity probe with low non-specific fluorescence.” *Chemical Communications*, 24:2601-2603 (DOI: 10.1039/b602699k).



CrAsH (left) is a tetracysteine-binding probe, which is insensitive to hydrophobic moieties, resulting in improved fluorescence properties.