Single-molecule localization techniques provide high spatial resolution in protein labeling

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Protein labeling with synthetic fluorescent probes is a key technology in chemical biology and biomedical research. The target proximity achieved by small-molecule probes is essential to exploit the full potential of super-resolution fluorescence microscopy.

Single-molecule localization techniques provide high spatial resolution by reporting on the position of the fluorophore and thus only indirectly on the target molecule itself. Large labels, such as antibodies, can misleadingly position a fluorophore tens of nanometers away from the target. Since single-molecule localization microscopy can achieve almost the ultimate spatial precision.

To overcome these limitations while at the same time achieving a labeling specificity comparable to that of antibodies, a team of Frankfurt scientists has developed the small labeling pair (SLAP) technology, which fulfills all necessary requirements for single-molecule localization microscopy.

This highly sensitive and efficient modular labeling approach, published in the latest issue of the journal *Angewandte Chemie*, is based on a synthetic small-molecule recognition unit and the genetically encoded minimal protein His6-10-tag. It avoids masking by large probes and supplies sensitive, precise, and robust size analysis of protein clusters. The efficient and modular technique will pave the way to high-

throughput high-resolution localization analysis of almost the entire His-tagged proteome.

More information: "SLAP: Small Labeling Pair for Single-Molecule Super-Resolution Imaging." *Angew Chem Int Ed Engl.* 2015 Aug 24;54(35):10216-9. DOI: 10.1002/anie.201503215

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