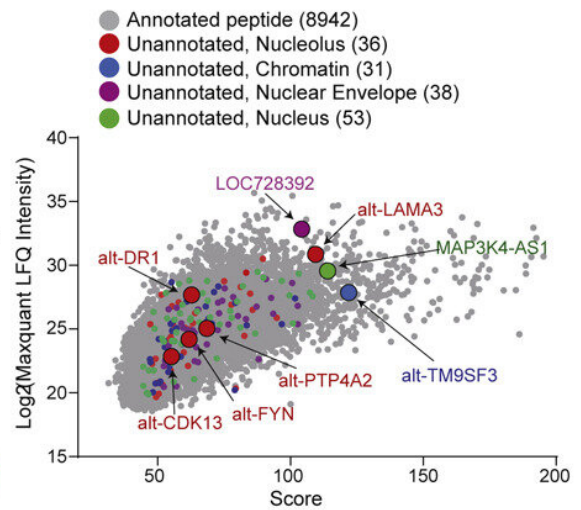
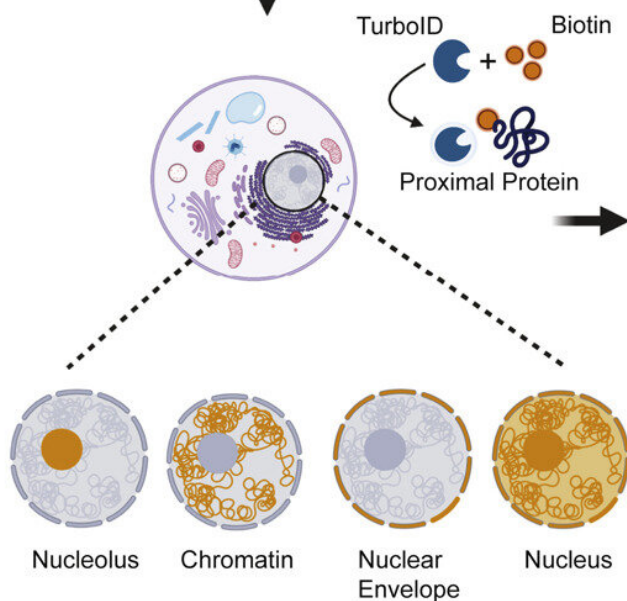
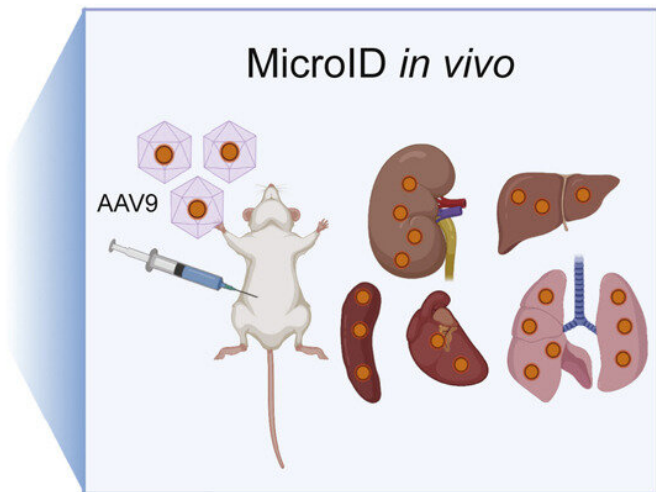
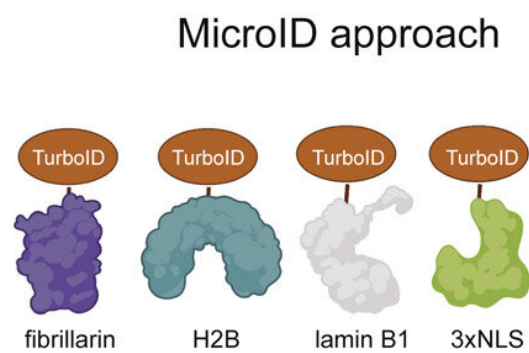


# Scientists 'spray paint' cells to reveal secret genes

August 1 2022, by Dani Flores



Mapping (sub)nuclear-localized microproteins and alternative proteins

Graphical abstract. Credit: *Molecular Cell* (2022). DOI: 10.1016/j.molcel.2022.06.035

Many of the thousands of proteins that help our cells grow and function remain undiscovered, especially the tiniest ones that occupy what some Yale scientists are calling the "dark matter" of our genome.

While thousands of these lesser known "microproteins" have recently been identified, many more remain elusive, and even less is known about their roles and functions.

With the [development](#) of new "MicroID" technology, researchers at Yale have struck upon a novel approach that identifies where microproteins live in our [cells](#) and their functions in the body.

"Our technique is like spray painting various areas of a cell with a tag that allowed us to 'grab' and identify all of the microproteins in that cellular region," said Sarah Slavoff, Associate Professor of Chemistry and of Molecular Biophysics and Biochemistry at the Yale Institute of Biomolecular Design and Discovery. Slavoff is the senior author of the study published today in *Molecular Cell*.

In collaboration with co-first author Xiaoyun Dai, a postdoc fellow in the Chen Lab at the Systems Biology Institute, postdoc Zhenkun Na mapped previously unannotated microproteins and alternative proteins, for the first time validating the MircoID technique in [live cells](#).

"Combining chemical biology tools with modern gene editing methods helps us to move beyond a list of microprotein sequences to figure out which ones might actually be doing something in our biology," said Na, a member of the Slavoff Lab at Yale's West Campus.

"In the future it's not going to take us another hundred years to figure out which of these novel genes are involved in important biological processes."

The new technology brings scientists closer to understanding how these mysterious proteins function in normal [biology](#)—and disease.

**More information:** Zhenkun Na et al, Mapping subcellular localizations of unannotated microproteins and alternative proteins with MicroID, *Molecular Cell* (2022). [DOI: 10.1016/j.molcel.2022.06.035](https://doi.org/10.1016/j.molcel.2022.06.035)

Provided by Yale University

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