Controlling Autophagy with Stapled Peptides

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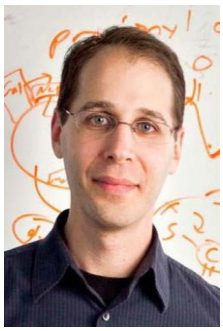

Autophagy is a cellular recycling process important for health and disease, and a major focus for new types of targeted protein degradation. We used structure-based design to develop stapled peptides that bind the critical autophagy proteins LC3B and GABARAP with nanomolar affinities. Small changes in staple structure produced ligands with very different binding modes, leading to differences in paralog selectivity. The stapled peptides exhibited considerable cytosolic penetration and resistance to biological degradation. They also reduced autophagic flux in cultured ovarian cancer cells and sensitized ovarian cancer cells to cisplatin. These small, potent stapled peptides represent promising autophagy-modulating compounds that can be developed as novel cancer therapeutics and novel tools for targeted protein degradation.

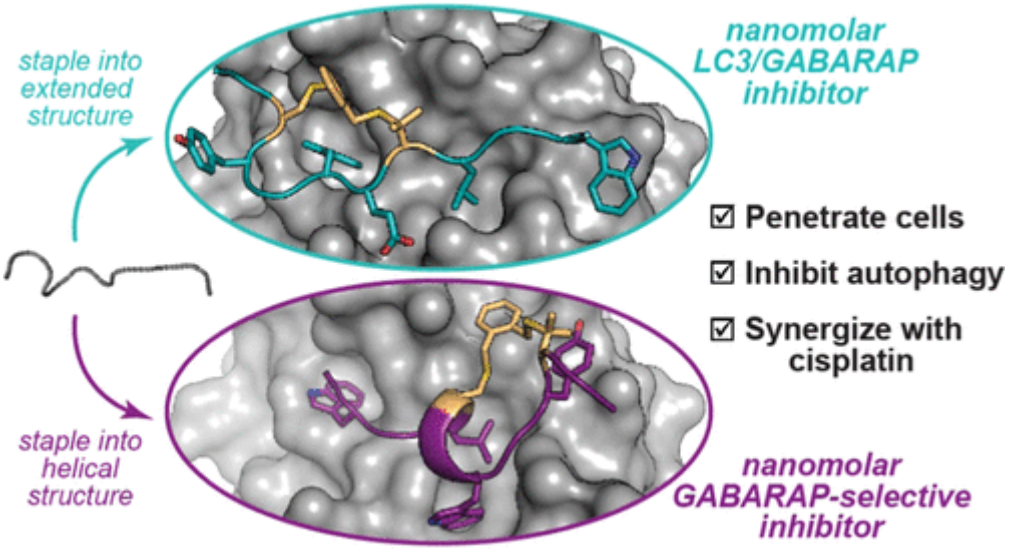

Figure 1. Graphical summary of structure-based design of stapled peptides that bind autophagy proteins LC3B and GABARAP.

Reference

[1] H. Brown, M. Chung, A. Üffing, N. Batistatou, T. Tsang, S. Doskocil, W. Mao, D. Willbold, R.C. Bast Jr., Z. Lu, O.H. Weiergräber, J.A. Kritzer. *Journal of the American Chemical Society* 2022, **144**, 14687-14697.