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# High-Throughput Generation of Block Copolymer Libraries via Click Chemistry and Automated Chromatography

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**What was achieved?:**
Researchers developed a high-throughput strategy to generate large libraries of well-defined block copolymers by integrating automated chromatography with click chemistry and robotic synthesis. Starting from a single reactive parent diblock copolymer, the team produced a library of 90 materials spanning a wide range of compositions and functionalities without requiring individual optimization of synthesis or purification conditions. This modular workflow enables rapid and systematic exploration of structure–property relationships across broad chemical space while maintaining precise control over polymer architecture.

**Why is it important?:**
Exploring the vast design space of block copolymers is traditionally limited by slow, iterative synthesis and purification workflows. By combining automation with modular polymer chemistry, this work demonstrates a scalable strategy for accelerating materials discovery and enabling efficient screening of diverse polymer compositions and functionalities. The ability to rapidly generate well-defined libraries of materials supports faster identification of structure–property relationships and advances the design of polymers for applications such as membranes, nanostructured materials, and advanced coatings.

**How did BioPACIFIC MIP enable this?**
BioPACIFIC MIP enabled this work through access to automated chromatography and robotic synthesis infrastructure that supports high-throughput polymer discovery. These capabilities allowed rapid generation of diverse block copolymer libraries and efficient exploration of structure–property relationships across a broad compositional landscape.

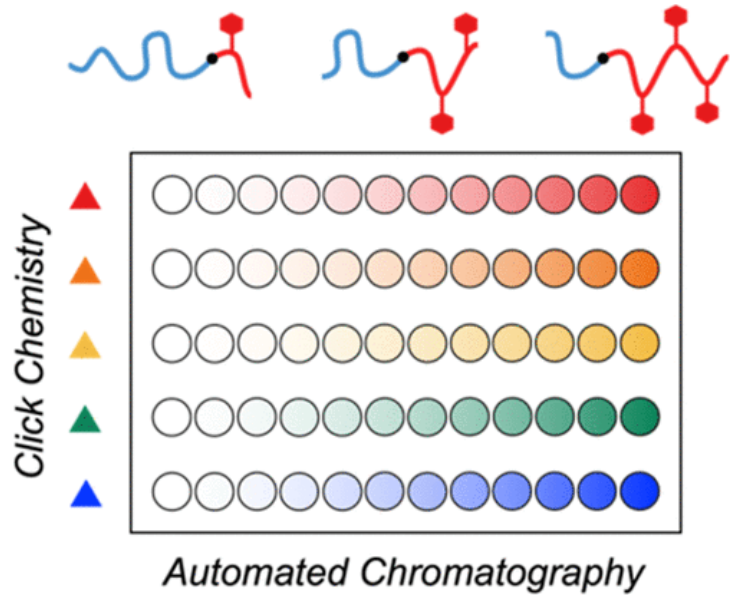



***Figure 1**. A modular workflow integrating automated chromatography and click chemistry enables efficient exploration of block copolymer chemical space.*

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