# The Study of Possibilities of Using Diazonium Salt of Activated Ester for Peptide Cyclization

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Peptide cyclization is a common chemical modification of linear peptides, resulting in the formation of cyclized frameworks. Compared to their linear counterparts, cyclic peptides are well known for their enhanced stability, greater resistance to enzymatic degradation, and improved cell permeability – properties that are highly valuable in various scientific fields, including modern medicine. Although many cyclization methods have been developed to date, most suffer from drawbacks such as low chemoselectivity, demanding and costly synthesis, or the use of toxic catalysts. Therefore, the development of simple, efficient, and reliable methodologies for cyclic peptide preparation remains a critical challenge. Accordingly, the aim of this project was to develop and experimentally validate a novel methodology for peptide cyclization using the diazonium salt of the activated ester derived from aminobenzoic acid. This compound can serve as a peptide stapling reagent, linking the lysine side chain or N-terminus of a peptide backbone with the phenolic part of tyrosine, and thus enabling the creation of peptide cycle. The proof-of-concept for this newly developed peptide cyclization approach was successfully demonstrated on a series of model peptides varying in length and amino acid sequence prepared beforehand using the solid-phase peptide synthesis. Obtained crude materials were purified by semi-preparative HPLC and subsequently freeze-dried. The resulting solid products were characterized by LC-MS, NMR, and HRMS. The developed peptide cyclization approach shows potential for the development of new cyclic peptide therapeutics, including antibiotic, anticancer, and antiviral agents, as well as for applications in biotechnology, research and more.

**Awards Won:**
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