Research article: Advancing Sustainability in Peptide Synthesis

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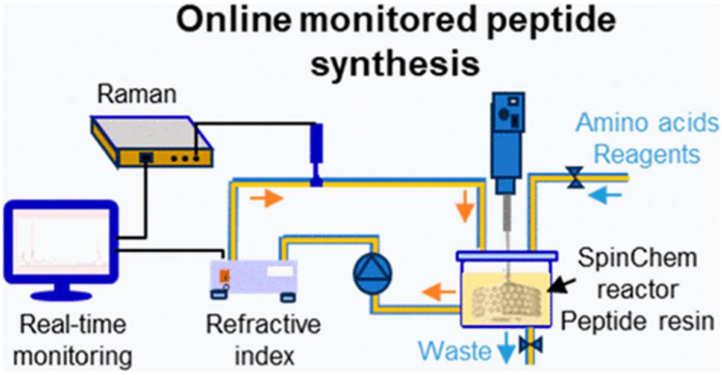
EUROAPI's Research and Development teams have made significant strides in enhancing the sustainability of solid-phase peptide synthesis (SPPS). The recent study, led by Eugenie Fournier, Arjun Vijeta, Oleg Babii, Mohamad-Jamal Wawi, Bernd Henkel, and Hélène Adihou, introduces a groundbreaking method that combines real-time monitoring using Raman spectroscopy, the use of a rotating bed reactor, and the substitution of traditional solvents with greener alternatives.

This pioneering work published in *Sustainable Chemistry & Engineering* of the American Chemical Society by EUROAPI's dedicated team not only advances the field of peptide synthesis but also sets a new standard for sustainability in the pharmaceutical industry.



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More about the study

The team has successfully integrated Raman spectroscopy as a process analytical tool (PAT) for real-time monitoring and optimization of reaction steps. This innovative approach allows for precise control of reaction endpoints, leading to accelerated development, reduced waste generation, and enhanced reaction efficiency. Additionally, the study replaces the environmentally concerning N,N-dimethylformamide (DMF) with a green solvent mixture of dimethyl sulfoxide (DMSO) and ethyl acetate (EtOAc).

A notable highlight of the research is the introduction of the SpinChem rotating bed reactor. This unique design facilitates easy integration of PATs, enabling efficient solid-phase synthesis. The combined use of PAT, green solvents, and the SpinChem reactor has demonstrated significant improvements in the synthesis of peptides such as Gonadorelin and Aib-enkephalin.

The study also showcased the effectiveness of real-time monitoring in overcoming challenges such as steric hindrance during peptide coupling and optimizing reaction conditions under varying temperatures. The integration of these technologies not only improved the purity and yield of the peptides but also significantly reduced the Process Mass Intensity (PMI), underscoring the enhanced sustainability of the approach.

Acknowledgements
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