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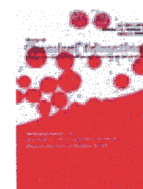
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Introducing Freshmen Students to the Practice of Solid-Phase Synthesis

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A one-semester laboratory project on solid-phase peptide chemistry was designed pedagogically to cater to freshman science students. The approach not only permitted multistep syntheses that would be considered impractical in solution, but also gave students insight into fundamental aspects of research at an early stage of development. Young scientists prepared Bz-Asn-Asn-Phe and Bz-Asn-Gln-Phe--peptides envisaged as potential competitive inhibitors of chymotrypsin. The synthesis, defined by an attachment-deprotection cycle, two elongation-deprotection cycles, and a benzoyl-capping protocol, was completed manually on Wang resin using Fmoc chemistry. Students quantified the yield of each condensation and deprotection reaction by measuring levels of dibenzylfulvene chromophore, a stoichiometrically afforded by-product. Benzoylation of the N-terminus was confirmed by employing a cadmium-ninhydrin reagent. The group also ascertained, through use of a chromogenic substrate, that chymotrypsin-catalyzed hydrolysis was impeded slightly when carried out in the presence of target peptides. Supplementary analyses supporting peptide purity and composition were given to students. Grading was based on laboratory participation, project proposals, reports, and a concluding slide-show presentation made to peers and colleagues. While the project was time-consuming overall, students acquired an impression of research work and an appreciation of the utility of solid-phase methods.



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