Synthesis of Peptides by Using Recombinant Proteins

Significance: In 2001, Aimoto and co-workers reported an approach for the synthesis of polypeptides by using recombinant proteins in combination with peptide thioesters. A thiol-linker-attached peptide for condensation with the peptide thioester was successfully synthesized from a nonprotected peptide through periodate oxidation of an N-terminal serine residue, followed by reductive amination with 4,5-dimethoxy-2-mercaptobenzylamine (Dmb-NH₂).

Comment: A N-2-mercaptobenzyl group on the backbone of a peptide is too stable under acidic conditions. The introduction of two methoxy groups on the benzene ring permitted the Dmb group to be removed, after condensation, by treatment with 1 M TIOH in TFA. Instead of periodate oxidation of serine and threonine, transamination of N-terminal amino groups could also be used in principle, although the stereochemistry resulting from the reductive amination should be controlled.