

Methods in Enzymology
Volume 289 (A)

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Volume 289

Solid-Phase Peptide Synthesis

EDITED BY

Gregg B. Fields

DEPARTMENT OF LABORATORY MEDICINE AND PATHOLOGY

BIOMEDICAL ENGINEERING CENTER

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SOLID-PHASE PEPTIDE SYNTHESIS



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Preface

It has been nearly forty years since the advent of the solid-phase method for the assembly of peptides. Prior volumes of *Methods in Enzymology* have included certain aspects of the solid-phase technique, such as the synthesis of bioactive peptides and combinatorial libraries, or analytical techniques used to characterize synthetic peptides. However, this is the first volume of the series dedicated entirely to the practice of solid-phase peptide synthesis, including the principles and methods for peptide construction and analysis. Both the *tert*-butyloxycarbonyl (Boc)- and 9-fluorenylmethoxycarbonyl (Fmoc)-based synthetic chemistries are described. A variety of analytical techniques, ranging from the more traditional approaches (amino acid analysis, Edman degradation sequence analysis, high-performance liquid chromatography) to the most current innovations (mass spectrometry, capillary electrophoresis), are presented. A section has been devoted to specialized techniques for creating modified peptides and small proteins, which represent some of the current and exciting peptide-related research areas. Included in this section are the construction of phosphorylated, glycosylated, and cyclic peptides, and assembly of proteins using peptide fragments. The volume concludes with specific applications of synthetic peptides for the study of structural and biological problems of interest. These applications include utilization of several "designed" peptides, whereby site-specific isotopic labels have been incorporated for structural studies or lipophilic compounds have been added to promote the formation of distinct molecular architecture.

The collected works presented in this volume represent the practicality and power of solid-phase peptide synthesis for attacking scientific problems in biological, biophysical, and biochemical disciplines.

GREGG B. FIELDS

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