Peptides such as gastrin I, VIP, and CCK could not, until very recently, be synthesized by solid-phase peptide synthesis (SPPS). Nevertheless, solution peptide techniques allowed characterization of peptide segments (generally protected) that could be purified by crystallization.

Some biologically active peptides are readily available because they can be chemically synthesized. The synthetic replicas of the peptide represents the most economical and readily accessible source of peptides under 50 amino acids. Table 1 lists novel toxins and bioregulators that have been synthesized by SPPS.

Owing to Merrifield's solid-phase approach to peptide synthesis (SPPS), duplication of a given structure can be accomplished in a few days. Even though the homogeneity of the peptides thus generated has been questioned, a new technique of analysis and isolation (reverse-phase high pressure liquid chromatography, RPHPLC) allows an evaluation of the peptide's purity. Other valuable separation methods include ion-exchange chromatography, partition chromatography, countercurrent distribution, and affinity techniques. Proper amino acid composition can be verified using sensitive automated sequencers.

Recently, in the field of structure-activity relationships, fragments or substituted analogues have been found to be of equal or greater potency when compared to the parent molecule. They can also exhibit long-acting or antagonistic activities. This is in