

2.0 TECHNOLOGICAL CHANGES AND PEPTIDE TOXINS AND BIOREGULATORS

This section reviews the important changes in technology used in peptide chemistry over the period 1975-1990. Included are the isolation, identification, synthesis, and large-scale production of biologically active peptides. Emphasis will be placed on methods of production.

There are two major methods that could be used to produce militarily significant quantities of peptides. First, recombinant DNA-modified microorganisms can be used to produce peptides biologically. This method is newer and holds great promise. The second method is chemical synthesis. While chemical synthesis of peptides has been possible for 25 years, the last ten years have seen major technical improvements in the accuracy of synthesis. Dramatic advances in peptide chemistry in the past ten years have also increased the capability of producing kilogram quantities of peptides. Section 2.4 gives an overview of the increases in production capabilities.

A third method of production exists, although it is more restricted in its application. Enzymatic synthesis makes use of an enzyme catalyst to form a peptide chain. For example, the dipeptide aspartame is mass produced with this technology. A limiting factor is that only very small peptides can be produced with this technique.