2.2 Genetic Engineering and Peptides

Genetic engineering has generally been equated with recombinant DNA technology. However, genetic engineering also uses many other technologies, such as DNA sequencing and synthesis, protein sequencing and peptide synthesis, monoclonal-antibody generation, microbial genetics, and computer analysis. For the purpose of this report, genetic engineering is considered to be the procedures performed on genes. These include: the isolation, expression and modification of DNA that encodes specific genes.

One of the most powerful techniques for the construction of peptides (and proteins) has been the cloning of genes. This is followed by the expression of the corresponding naturally occurring proteins in suitable host systems. Many peptides are derived from larger proteins and, therefore, cloning of the protein may be an option for production. To obtain modified protein structures, the techniques of site-directed mutagenesis have been used to modify the gene structures. Alternatively, with the considerable progress that has been made in DNA synthesis, both natural and modified proteins can be prepared through the expression of corresponding synthetic genes.

From 1975 to 1985, most work concentrated on using bacteria to express polypeptides. A number of problems exist with recombinant DNA techniques. Low yield, lack of secretion out of the host organism, and difficulty in purification are among the more