

serious problems. This is partly due to incompatibility between the mammalian polypeptides and the bacterial hosts. Research has subsequently led to two advances that might overcome the difficulty of using bacteria as the host for production. Both advances depend on the transfer of genes which code for the production of the desired peptide in domestic animals and plants. Companies in North America and Europe have developed large-scale production capabilities using transgenic hosts. Although this is not a proven capability, it may hold important applications for the future.

The amino acid sequence of a given biologically active peptide usually differs slightly from species to species. However, a peptide derived from animals is usually active in humans. Some bioregulators do not require the presence of all amino acids of the parent molecule to maintain biological activity. For example, the adrenocorticotropin hormone (ACTH) is a single chain peptide containing 39 amino acids, of which the first 24 amino acids are responsible for its biological activity. In fact, when the last 15 amino acids are removed, it does not affect the hormone's biological activity.

Naturally occurring small peptides can be synthesized by direct chemical means or by recombinant DNA technology. Somatostatin is a 14-amino-acid hormone which regulates the release of growth hormone, glucagon, and insulin. It was among the first hormones made by genetic engineering and was the first for which