The melanocyte stimulating hormones, $\alpha$- and $\beta$-MSH, are found in the pituitary glands of mammals. These substances are linear polypeptides composed of 13 to 22 amino acids. In very small concentration they can darken the melanocytes of frogs and some other marine animals. The metabolic role of these hormones in man and other mammals is unknown. However, there is good evidence that MSH, when released by the pituitary gland in excessive amounts as in patients with adrenal cortical insufficiency, produces hyperpigmentation of the skin. Thus far only a single $\alpha$-MSH but 3 $\beta$-MSH’s have been found. $\alpha$-MSH from hogs, cattle and sheep is made up of 13 amino acids which are the same as the first 13 amino acids of corticotrophin (ACTH). However, the N terminal serine has an N-acetyl group and the C terminal valine is in the form of an amide. Recently $\alpha$-MSH was found in human and monkey pituitary glands. The structure of $\alpha$-MSH from human and monkey sources will be described if current investigations are completed before the meetings. Experiments on the isolation and determination of the structure of $\beta$-MSH from human and monkey pituitary glands also will be presented.

The synthesis of $\alpha$-MSH by K. Hofmann and collaborators has made available many intermediate peptides ranging from 5 to 13 amino acids as by-products. Most of the small peptides can darken frog skin. Darkening activity increases as the peptide structure becomes more similar to that of natural $\alpha$-MSH. The activity of synthetic $\alpha$-MSH with and without various blocking groups will be discussed.

Synthetic and natural $\alpha$-MSH, porcine $\beta$-MSH and porcine ACTH will be given to a human subject at different times. The skin darkening effects of these four peptides after parenteral administration to human beings will be compared.