

EVOLUTION

Men and apes close blood relatives

From comparative studies of red blood cells of men and apes, two University of California scientists conclude that the two are more closely related than had been supposed. In fact, the Berkeley researchers speculate, mankind split off from his progenitors, the African great apes, no more than five million years ago. Some anthropologists have estimated that the split occurred as long as 30 million years ago.

In the August PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, Drs. Allan C. Wilson and Vincent M. Sarich report that a sequence analysis of hemoglobin from man and chimpanzees reveals an identical order of amino acid molecules. Comparing human and gorilla hemoglobin, they found that amino acid sequence varies in only two positions in the 300-amino-acid blood protein. Man and monkey differ at 12 positions.

BIOCHEMISTRY

Growth hormone and lactation

In 1966, Dr. Choh Hao Li reported the complete primary structure or amino acid sequence of human growth hormone. The hormone is imperfectly understood but is thought to stimulate the production of ribonucleic acid and hence the growth of cells. In addition, Dr. Li, of the University of California at San Francisco, postulates that HGH plays a role in lactation in women.

Now, he and his colleagues may be able to prove that theory. They have deciphered the primary structure of the hormone that regulates lactation in sheep (ovine lactogenic hormone) and found it to be similar to HGH. The sheep hormone contains 198 amino acid molecules; HGH has 188. From comparative studies, Dr. Li hopes to determine which portions of the HGH molecule serve a lactogenic function and which portions play a role in promoting growth. With this information, it might be possible to synthesize the active portions of HGH for clinical use. At present, HGH is used to treat dwarfism, which occurs in about 20,000 individuals in the United States. But the hormone, which must be extracted from pituitary glands at autopsy, presents supply problems.

ENDOCRINOLOGY

Clue to gene-hormone mechanism

Though hormones probably play no direct role in genetic expression, the hormonal environment of the body is thought to influence gene behavior. From research on the effect of growth hormones on chromosomes of a member of the fly family, Northwestern University scientists have clues to the mechanism of gene-hormone interactions. The process they observed in the larvae of *Chironomus tentans* may be analogous to that set in motion in human beings by human growth hormone.

Drs. Lawrence I. Gilbert and Markus Lezzi administered synthetic ecdysone, an insect hormone, to fourth-stage larvae and observed salivary gland chromosomes. Ecdysone, they reported at the annual meeting of the Entomological Society of America in Chicago, activated

a Balbiani ring—an area of the insect chromosome known to produce messenger-RNA. The activation induced by ecdysone is the first demonstration that the hormone triggers gene function at the Balbiani ring, the scientists said.

NUTRITION

Protein an inadequate measure

Protein consumption is not an entirely valid measure of nutrition or malnutrition, according to Dr. George Owen, professor of pediatrics at Ohio State University. Other measures must be taken into account.

Nearing the halfway point in a project in which he is sampling 5,000 children between the ages of one and six, Dr. Owen reports surprisingly normal protein levels in undernourished children from low income families. However, his tests show a clear relation between biochemical and nutritional deficiencies and low income profiles.

After assessing a nutritional history that compared diet and family resources, Dr. Owen tested each child for calorie count and calcium and protein intake. The biochemical tests included determination of levels of cholesterol, iodine, vitamins B-1 and B-2, hemoglobin, serum-iron and serum-protein in blood and rates of excretion of amino acids and nitrogen. He found that approximately 80 percent of the children from the lowest income quartile of the population studied were generally low in these factors, considered as a whole, even though their serum-protein measure was near normal.

The median income of the families in the study was under \$1,500 per person per year.

CELL BIOLOGY

Cell membranes and malignancy

Biochemical and physical differences in cell membranes are among the factors distinguishing normal from malignant cells. Gangliosides, chemicals in cell membranes, may be the key to the abnormal growth processes of cancer cells, researchers from the National Institutes of Health report.

Gangliosides, when present on the cell surface, may influence the surface charge and adhesiveness of the cell. These in turn could affect the cells' ability to control or limit each others' division by coming into contact with one another—a process called contact inhibition.

Drs. Peter T. Mora and Roscoe O. Brady, with assistants Vivian McFarland and Roy Bradley, studied mouse cells deliberately infected with the tumor-causing SV40 (Simian) virus, and cells that showed spontaneous transformation.

Virally transformed cells showed a marked reduction in the amount of gangliosides, they report in the July PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. No such decrease was noted in the cells that underwent spontaneous transformation. The virus-transformed cells were considerably more crowded together as they grew in tissue culture, presumably because of changes in patterns of contact inhibition.