medical sciences

A cancer-specific enzyme

One of the toughest challenges facing cancer researchers is determining what properties belong exclusively to cancer cells. Edward Reich and his team at Rockefeller University report in the January JOURNAL OF EXPERIMENTAL MEDICINE that they have come up with a clear-cut biochemical difference between cancer cells and normal cells.

After normal cells are transformed to cancerous cells, they release a factor not formed by normal cells. The factor interacts with a blood protein. This interaction activates an enzyme that degrades fibrin, a blood-clotting and wound-healing protein.

Fibrin degradation might provide quick nutrients (protein) for rapidly growing cancer cells. It might also prevent clotting and wound healing and allow cancer cells to burgeon into a tumor. Tests to detect the fibrin-degrading enzyme might lead to better diagnosis of cancer. Drugs might also be designed to wipe out the enzyme.

Loss of DNA with aging

One explanation of aging is that DNA (genes) no longer function or repair themselves. Another is that proteins make errors in self-replication. Still another is that normal cell replication is blocked (SN: 11/4/72, p. 294). In the Dec. 15 NATURE, Roger Johnson and Bernard L. Strehler of the University of Southern California report the selective loss of DNA from the brain cells of aging (10-year-old) dogs.

The lost genes code for ribosomal RNA, which plays a major role in the replication of DNA into RNA and then into proteins. The key observation by the Los Angeles biologists was that DNA from 10-year-old dog brains hybridized (crossed) 29 percent less with ribosomal RNA than did DNA from younger dog brain, liver and spleen. The results, the authors say, are most readily interpreted as selective loss of DNA coding for ribosomal RNA. Such a substantial loss of genetic material, they believe, could not help but impair the brain function of the aging dogs.

Smoking, carbon monoxide and the fetus

There has been building clinical and animal evidence during the past 15 years that cigarette smoking during pregnancy can cause premature or low-weight births, spontaneous abortions and stillbirths. One study suggested that the offending substance is nicotine. In the Dec. 9 LANCET, Poul Astrup and his colleagues at the Rigshospitalet in Copenhagen suggest that carbon monoxide in tobacco smoke is the offender.

They followed 176 smokers and 177 nonsmokers through their pregnancies. There was a definite correlation between smoking women, somewhat elevated blood levels of CO and low birth weights. They also exposed pregnant rabbits to higher levels of CO than smoking women are exposed to. The animals experienced much higher blood levels of CO than the smoking women experienced. Their exposure also resulted in a 20 percent decrease in birth weight and a neonatal death rate of 35 percent, compared with one percent for a control group.

The Danish investigators conclude, on the basis of this clinical and animal evidence, that CO may well be the factor in cigarette smoke that can harm the fetus.

behavioral sciences

Beautiful is good

Beauty may be more than skin deep. Physical beauty makes a first impression that can play an important role in molding the personality of an attractive person. Karen Dion and Ellen Berscheid of the University of Minnesota and Elaine Walster of the University of Wisconsin designed a study to determine if a physical attractiveness stereotype exists and, if so, to investigate its content and effect.

They report in the December JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY that college students tend to relate physical beauty with interior beauty. Sixty students made personality assessments of photographs of attractive, unattractive and average persons. As suspected, the beautiful people were judged to have more socially desirable personalities. Such first impressions may be logical, say the researchers, because inward character can influence outward beauty and vice versa. A calm, relaxed person may develop fewer lines and wrinkles than a tense, irritable person. An attractive person who is consistently treated as a sincere, noble and honest individual may become one.

Diazepam syndrome

Diazepam (Valium) is often prescribed for relief of tension and anxiety due to stress. It is useful in psychoneurotic states manifested by apprehension, fatigue, depressive symptoms or agitation. Alcohol withdrawal, skeletal muscle spasm and convulsive disorders are also treatable with diazepam. At low dosage, side effects are rare. Even at higher than normal dosage, the drug is considered to be nontoxic. But Richard C. W. Hall and Joy R. Joffe at the Johns Hopkins University School of Medicine warn that diazepam can produce a toxic syndrome in some individuals. Six case studies are reported in the December AMERICAN JOURNAL OF PSYCHIATRY. The six patients showed signs of tremulousness, apprehension, insomnia and depression. These symptoms were followed by suicidal tendency of an ego-alien type ("I feel as if I am going to kill myself but I really don't want to die"). None of the symptoms was present before diazepam therapy and all subsided when the drug was discontinued. Since this syndrome leads to a type of suicidal tendency that is not easily recognized, the researchers warn of the extreme hazard of continuing diazepam therapy in patients who begin to show any toxic side effects.

Hormones and sexual stimulation

Hormones are known to influence behavior by acting directly on the brain. On the basis of behavioral responses in animals, it has been proposed that hormones also act on peripheral neuronal mechanisms (outside the central nervous system) to affect behavior by altering sensory input. In the Dec. 22 SCIENCE Barry R. Komisaruk of the State University of New Jersey, Norman T. Adler of the University of Pennsylvania and John Hutchinson of Cambridge University give neurophysiological evidence that hormones do change peripheral neural activity. Recordings were made of neuronal activity in the genital area of estrogen-treated rats whose ovaries had been removed. The sensory field of the genital area nerve was found to be significantly larger in the hormone-treated rats than in uninjected controls.