

Safe for chromosomes

Increased awareness that environmental factors such as drugs and food additives may damage cells, inducing mutations or tumors, has been followed by an upswing in the number of scientific studies of suspect materials. In many recently reported instances, the suspect has been found guilty. Now, three scientists studying aspirin bring in a verdict of not guilty.

Reporting in the July 10 *SCIENCE*, Drs. Irving Mauer, David Weinstein and Harvey M. Solomon of a research unit at Hoffman-La Roche in Nutley, N.J., say that aspirin does not damage chromosomes in human leukocytes or white blood cells. Some recent studies had offered preliminary evidence to the contrary.

The research team screened aspirin in a classic cytogenetic test in which one evaluates the effect of an agent on the chromosomes and growth of leukocytes in the laboratory. They added aspirin to cultures of human leukocytes at several time periods at concentrations varying from 0.1 to 300.0 micrograms per milliliter and examined leukocytes drawn from the blood of volunteers who had ingested two 300-milligram tablets four times daily for one month. Their findings: "No significant increase in chromosome aberrations."

ANALGESICS

Increasing effectiveness

Many present studies of metabolic interactions of drugs are aimed at preventing undue toxic reactions. Dr. Gerald Levy of the State University of New York at Buffalo suggests that studies of drug interactions can also focus on increasing the effectiveness of certain analgesics. He has been experimenting with nonnarcotic analgesics, including salicylates, to determine how they are metabolized, what breakdown products appear and to what extent these drugs inhibit or enhance each other.

Nonnarcotic pain-killers, Dr. Levy pointed out at a recent New York Academy of Sciences conference on drug metabolism, are metabolized by pathways with limited capacities; pathways are saturated by relatively small doses of drug. Hence increasing doses of drug will not lead to increased pharmacologic effect because the body cannot readily utilize the additional quantity of drug. As new studies refine knowledge of how these nonnarcotic analgesics are handled by the body and how they interact with other compounds, it may be possible to develop useful combination therapies, employing compounds that will alter metabolism sufficiently to skirt the saturation effect and enhance pain-killing action.

BIOCHEMISTRY

An aid to Parkinson's victims

Amantadine hydrochloride (Symmetrel) is an antiviral, antiflu drug which has been reported to have some therapeutic effect in treating individuals with Parkinson's disease (SN: 6/7/69, p. 550). A tentative explanation of this effect is reported in the July 10 *SCIENCE* by investigators from the E. I. du Pont de Nemours and Co., Inc. of Wilmington, Del.

From experiments with dogs, Drs. R. P. Grelak, R.

Clark, J. M. Stump and V. G. Vernier conclude that amantadine releases catecholamines, neurohormones, from storage sites in peripheral nerve tissue. "We think that amantadine may have the same action within the central nervous system," they report. These hormones, particularly dopamine, play an intimate role in the tremors experienced by patients with Parkinson's disease.

While amantadine itself had some effect in triggering catecholamine release, their release was markedly enhanced in dogs primed with dopamine.

AMINO ACIDS

Fetal necessity

In the normal adult, cystine is ranked among the nonessential amino acids—those the body can produce itself and therefore does not absolutely have to procure from the diet. However, this cystine classification may not apply to the human fetus or very young infant.

In the adult, cystine is produced by a metabolic pathway involving the enzyme cystathionase. In the developing fetus, this enzyme appears to be absent from both liver and brain tissue where it should be detectable, according to a report in the July 3 *SCIENCE* by a team of three researchers. They studied fetuses obtained at abortions and one four-hour-old infant who died of hemorrhage.

Though cow's milk is higher in protein than human milk, mother's milk contains far more cystine, suggesting it could be particularly important to normal growth and brain development in premature infants.

The studies were conducted by Drs. John A. Sturman of the New York State Institute for Basic Research in Mental Retardation, Gerald Gaull of the Mt. Sinai Hospital School of Medicine and Neils C. R. Raiha of Helsinki University Central Hospital in Finland.

ZOOLOGY

Sex reversal in fish

Females of a species of fish in the Red Sea, *Anthias squamipinnis*, can become males if the ecological need arises, says Dr. Lev Fishelson in the July 4 *NATURE*. From experiments conducted during 1968 and 1969, he concludes that this sex reversal is regulated by environmental factors.

When 10 to 20 females were housed for several months with only one or two males, there were no behavioral or physiological changes in the females to indicate sex reversal. However, when groups of 20 females were isolated from males, one of the females changed into a male, developing masculine color pattern, behavioral characteristics and degeneration of the ovaries, within two weeks. When this new male was removed from the aquarium, another male developed from the remaining 19 females. "By continuously repeating this process," the scientist from Tel-Aviv University in Israel says, "20 males had been developed from the original 20 females by the end of the year."

In the sea, populations of *Anthias* consist of about 80 to 90 percent reproducing females, some of which become males if the male population is depleted. Observes Dr. Fishelson, "From the point of view of survival, such an arrangement is of obvious value."