# BIOLOGY

## Tumor virus on sequence band wagon

A virus known to cause tumors has now been analyzed down to the letters of its genes. At a recent meeting in Cold Spring Harbor, N.Y., Sherman Weissman and co-workers at Yale University reported the exact sequence of the 5,200 nucleotide pairs in the SV40 chromosome. SV40 is the third virus to be completely sequenced, but it is the first animal or tumor virus to be analyzed in such detail.

The SV40 sequence reveals surprises similar to those that accompanied recent discoveries with animal genes, a bacterial virus and another animal virus. The sequence is "in complete violation of bacterial genetics," Weissman says.

The biggest shock was that a segment of DNA containing several protein synthesis stop signals sits in the middle of one SV40 gene. Somehow that DNA usually does not get its message through to the cell's protein-making machinery. Other intervening sequences were recently identified in yeast and animal DNA (SN: 10/1/77, p. 214). Weissman suggests that the SV40 region is jumped when the messenger RNA forms on the DNA template.

Preliminary results from several laboratories indicate that the viral DNA does produce small amounts of a shorter protein represented by the nucleotides before the first stop signal. With a strategy different from that of the bacterial virus phiX174 (SN: 3/5/77, p. 149), this virus seems to pack the information for producing two proteins into a single stretch of DNA.

The sequence findings also confirmed the existence of leader sequences that code for messenger RNA segments that are spliced to the messages of other genes but that do not actually code for any part of the protein. Such sequences have also been detected in adenovirus (SN: 7/30/77, p. 70). Finally, the SV40 virus appears to differ from bacterial phiX174 in its selection of code words to indicate particular amino acids.

## Virus widespread in cat saliva

Leukemia in cats is caused by a virus that spreads from one cat to another. Donald P. Francis and Myron Essex of the Harvard School of Public Health and William D. Hardy Jr. of Memorial Sloan-Kettering Cancer Center in New York are examining how that virus travels. Healthy cats often harbor the virus and can spread it to other cats as efficiently as can diseased animals. The researchers tested the blood, saliva, urine, feces and fleas from pet cats that had been naturally infected with the virus, but that showed no sign of disease. Feline leukemia virus, however, was most highly concentrated in the saliva, which contained as many as 100,000 living virus particles per milliliter. In future experiments the researchers plan to examine transmission of infection via the saliva to other cats and to primates.

Because the presence of the virus is not limited to leukaemic cats (the researchers estimate that 1 to 2 percent of all healthy cats carry it), studies that show no correlation between human leukemia and exposure to a leukaemic cat are not conclusive. "It seems too early to rule out a link between any human disease and exposure to FeLV [feline leukemia virus]," the researchers say in the Sept. 15 NATURE.

## Suspect the lab chow

Many commercial pet foods and laboratory animal feeds contain large amounts of lead, report James G. Fox and George W. Boylen Jr. of the Massachusetts Institute of Technology. A wide variety of ingredients, including animal byproducts, grains and spices are contaminated with the toxic metal. This finding suggests a danger to pets and to humans who eat pet food. Fox also warns scientists to be aware that contaminants in laboratory feed may introduce an unsuspected variable into animal experiments.

# ENVIRONMENT

## Troubling findings in *Troubled Waters*

Despite repeated findings of rampant chemical pollution in the nation's waterways, the government has yet to launch more than occasional attacks against toxic chemical pollution. But the Environmental Defense Fund is trying to spur such action. Its most recent effort was the release last week of a study citing the presence of toxic chemicals in the Hudson River, and the lack of action being taken.

The EDF conducted two earlier epidemiological studies linking ingestion of industrially polluted drinking water and human cancer. This study, titled *Troubled Waters*, was performed jointly with the New York Public Interest Research Group. It cites a chilling list of industrial chemicals entering the Hudson—and remaining there.

EDF worries that several important problems cited in the Hudson study are generic to other rivers that provide drinking water. For example:

- The U.S. Environmental Protection Agency is required to regulate the discharge of at least 74 industrial chemicals, but delay in implementing that regulation has delayed "regulating discharge of toxic pollutants, including carcinogens from industrial point sources," the study says. Further, "EPA has refused to require industry to divulge what chemicals are present in its waste, let alone conduct an analysis of their potential environmental and health effects. As a result ... we are no closer today to knowing the sources of potentially toxic chemicals in our drinking water than we were before the act was signed, five years ago."
- Water filtration plants in this country focus on traditional pollutants, such as total suspended solids, coliform bacteria, and others, but allow toxic chemicals to pass through unhampered, the study says.
- Most toxic-chemical monitoring is initiated only after a crisis, such as the PCB (polychlorinated biphenyl) scandal (SN: 10/16/76, p. 244), "and then efforts have usually been limited to the single pollutant in question." The study charges that no study has examined the broad spectrum of toxic chemicals present in the Hudson. This is important, it says, because more than 350 synthetic organic chemicals have been identified in drinking water (not just the Hudson's). Although more than 50 of these chemicals are suspected of causing cancer, only a few have been tested for carcinogenicity.

What are some solutions? "Technology exists today to significantly reduce or eliminate most toxic and carcinogenic organic chemicals found in drinking water," the study says, and these restrictions should be implemented soon. Also, better monitoring will identify sources of these chemicals so that region-specific programs can be started to clean them out of the water—or, better yet, to eliminate them at the source.

## Benzene dangers in the home

Exposure to benzene, principally in chemical laboratories, has been linked since 1928 with a risk of developing leukemia. Now the Consumer Product Safety Commission (CPSC) is considering a ban on benzene-containing products such as rubber cement, paint strippers and solvents because they, too, pose severe health hazards, such as the possibility of cancer.

Tests reported at a CPSC staff briefing last month disclosed that persons exposed for five minutes to a common paint remover would inhale a mean concentration in air of 130 parts per million benzene—more than 43 times the exposure currently permitted by federal occupational exposure standards. The product contained 52 percent benzene by volume.

Benzene appears in many products in concentrations up to 100 percent. In a Sept. 6 memorandum, the CPSC's Irv Weiss said that as many as 576,000 persons a year may be exposed to benzene vapors from paint removers, and as many as 591,000 to vapors from rubber cement.