

Hepatitis B Mutants Hide in Blood

The first large-scale survey of healthy blood donors for hepatitis B DNA suggests a significant portion of the human population harbors mutant forms of the hepatitis B virus that can't be detected by current laboratory tests. Such forms may be responsible for as many as one-third of the cases now dubbed non-A, non-B hepatitis, says medical researcher and study coauthor Girish N. Vyas of the University of California, San Francisco.

About 4 to 5 percent of U.S. blood-transfusion recipients contract non-A, non-B hepatitis, a poorly defined ailment that is diagnosed when lab tests indicate biochemical signs of liver injury but no signs of hepatitis in the blood.

In a previous study on the Italian island of Sardinia — where hepatitis B infection is 30 times more common than in the United States and so is easier to study — Vyas and co-workers Eliana Lai and Annalena Figus found that one-third of chronic liver disease victims diagnosed as having non-A, non-B hepatitis carried mutant forms of hepatitis B undetectable by standard tests for the virus. But until their recent study, published in the January BLOOD, it was unknown how many

apparently healthy individuals harbor such undetected mutant strains, which could contaminate blood supplies.

Lai and Figus screened 1,411 Sardinian donors who tested negative for hepatitis. The subjects fell into two categories: those with normal and those with abnormal levels of the liver enzyme alanine aminotransferase (ALT). High levels of ALT indicate liver injury and provide today's sole criterion for diagnosing non-A, non-B hepatitis, Vyas says. Using sensitive genetic probes, Vyas found that, of the 793 subjects with elevated ALT levels who originally tested negative for hepatitis B, 68 (9 percent) had hepatitis B DNA in their blood serum, indicating the presence of mutant forms of the virus.

In the United States, in addition to using a single test for hepatitis A and two different tests for hepatitis B, blood banks test for and reject blood with elevated ALT. So, although these 68 individuals would have been misdiagnosed with non-A, non-B hepatitis, their blood would not have been transfused.

But two of the 618 subjects with normal ALT levels had no evidence of hepatitis B by standard measures, and yet had hepa-

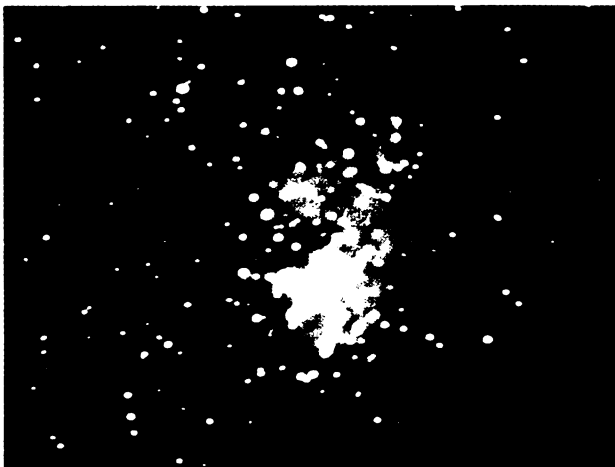
titis B DNA that would have been passed on to transfusion recipients. Vyas theorizes that mutant strains escape detection in the standard test — which uses an antibody to detect viral surface proteins — either by producing a very different-looking surface protein or by producing very little of it.

Vyas says a similar study of the prevalence of mutant hepatitis B is warranted in the United States. Scientists have yet to prove the mutant DNA detected will cause liver disease when passed to recipients. But the findings highlight the need to develop easy-to-use genetic tests that screen blood for a variety of hepatitis strains, he says. The most sensitive genetic test available, called the polymerase chain reaction, now takes at least 12 hours to perform and costs \$150.

Scientists have known for two decades that several agents can cause non-A, non-B hepatitis. In addition to those cases caused by mutant B forms, a significant proportion may be due to the so-called hepatitis C virus, first identified last May by researchers at the Emeryville, Calif.-based Chiron Corp. (SN: 5/14/88, p.308), Vyas says. Chiron has developed a screening test for the C strain that could go on the market as early as late 1989, says spokesman Larry Kurtz. — I. Wickelgren

The Orion Nebula's bright new image

Long featured on astronomical posters and calendars, the Orion Nebula is one of the most familiar sights in astronomy. Barely visible to the naked eye, it appears as a small, fuzzy patch of light just below the three stars in the belt of the constellation Orion. Capturing the multicolored splendor of the nebula's glowing gases on film generally requires special photographic techniques.



Now, astronomer Mark McCaughrean of the NASA Goddard Space Flight Center in Greenbelt, Md., and his collaborators, using a new electronic camera sensitive to infrared light, have penetrated the dust and gas responsible for obscuring the nebula's core. Their image of the nebula reveals a hitherto unseen, dense cluster of young stars.

The color illustration is a composite of three images taken at different infrared wavelengths. It reveals how the Orion Nebula might appear if the human eye were sensitive to infrared

light. The hottest sources appear blue, whereas cooler and dust-obscured sources are red. The nebula, located 1,500 light-years from Earth, is the nearest and brightest of all galactic nebulas, in which recently formed stars are still surrounded by gases left over from the formation process. The image shows at least 500 stars, of which more than four-fifths are visible only in infrared light. All the stars in this cluster, the densest young cluster known, would lie within two-thirds of the distance between the sun and its nearest stellar neighbors.

Recent decades saw wetter continents

Measurements from weather stations show that Earth's land areas have gotten wetter over the last few decades, say atmospheric scientists who have compiled a century's worth of global data. But they say it is not yet clear whether natural climate fluctuations or the predicted "greenhouse" warming have precipitated this change for the wetter.

Data from 2,201 stations for the period 1890-1986 indicate that the mean annual precipitation falling on land areas in the Southern Hemisphere has increased since the 1940s, while the Northern Hemisphere has seen no significant change, report Henry F. Diaz from the Environmental Research Laboratory of the National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colo., and his colleagues in the Jan. 20 JOURNAL OF GEOPHYSICAL RESEARCH. South of the equator, precipitation has increased mostly within the last 15 years.

When the researchers reported the Northern Hemisphere data two years ago, they had not yet compiled precipitation records for the Southern Hemisphere. Now, for the first time, those data enable