

In contrast, levels in the patients with large-cell lung tumors were similar to those of healthy persons.

Baylin and his team then examined levels of the enzyme in small-cell tumor tissue taken from five patients who had high levels of the enzyme in their blood. They found that the levels in the cancer tissue of four out of five of the patients were also high and sometimes in the range previously reported for medullary carcinoma tissue. Healthy lung tissue and other kinds of tissue taken from the patients did not have the high enzyme levels.

So, they conclude, "histaminase levels are elevated in the blood of a number of patients with small-cell lung cancer, and the elevated levels appear to come from cancerous lung tissue."

Baylin told *SCIENCE NEWS* that he hopes the enzyme can be eventually used to improve the diagnosis of small-cell lung cancer and to monitor the effectiveness of treatment of this kind of cancer. He is quick to point out, however, that a number of questions must be answered before the enzyme can be used routinely in this manner.

For instance, why do only some patients with the disease have elevated levels of histamine? What does an elevated level in the blood actually mean? Do therapies alter the enzyme, or does the enzyme change with the progression of the disease? And what is the role of the enzyme in lung cancer tissue? Says Baylin: "We're trying to isolate the enzyme from certain normal tissue where it occurs, such as the placenta, and to compare it with the tumor enzyme."

Might a somewhat elevated level of the enzyme in the blood be used to pinpoint people who are especially at risk from lung cancer? Baylin believes not. "I don't think that the level of the enzyme in the blood of patients with early lung cancer would be high enough to be of predictive value, especially since only one-third of patients with definite disease appear to have abnormal blood levels."

He concedes, however that if the enzyme turns out to be a definitive enough marker for small-cell lung cancer, purified enzyme preparations might be of future use in cancer therapy. Enzyme preparations might be injected into lung cancer patients to stimulate their immune systems to wipe out cancer cells. There is reason to believe that such immunotherapy might be effective. At the recent annual meeting of the American Association for Thoracic Surgery, for instance, Jack A. Roth, a surgeon at the University of California at Los Angeles School of Medicine, reported that lymphocytes taken from lung cancer patients made immune responses in the test tube to a crude extract of lung tumor antigens.

Alternatively, antibodies made to purified preparations of the enzyme might be directed against tumor tissue in persons with small-cell lung tumors. □

Knocking a galaxy into a cocked hat

Galaxies are generally considered to be among the flattest things in nature. They are large thin disks that can be characteristically 100,000 light years in diameter but only about 10,000 or 15,000 light years thick. However, at least two of them now have a distinctly 3-D image thanks to recent work of David H. Rogstad of the Jet Propulsion Laboratory, M.C.H. Wright of the University of California at Berkeley and Ian A. Lockhart of the California Institute of Technology.

Radio observations they did at Caltech's Owens Valley Radio Observatory give a distinct reverse twist to the galaxies M33 and M83. Results are to be published in the *ASTROPHYSICAL JOURNAL*.

The three radio astronomers were mapping the hydrogen in M33. Normally the hydrogen in a galaxy should lie in the same disk as the stars, but M33 showed, in addition to the expected disk, a strange new configuration, a cloud that was either intermingled with the disk or between it and the earth. The cloud was rotating with M33 but at only half the rotation speed of the disk (typically about 300,000 kilometers per hour).

Two other mysteries about the gas in M33 were already on the books. The disk gas itself did not have the usual flat shape but had wings that gave it an S-shaped appearance, and the edges of the disk cloud near those wings ended abruptly.

The key to the mysteries came from observations of M83. This proved to have a similar cloud, and the sight angle to M83 allowed the astronomers to deduce that its gas cloud was warped into an S shape, flat in the middle of the disk but bent up and down at the edges like the brim of a cocked hat. The same model fits M33 if they assume that the line of sight is such that the strange cloud they first observed is the bent edge of the brim through which they are looking toward the center of the disk.

Slight warping from gravitational attraction by a nearby galaxy is known for

several galaxies, but what could cause bends like these (up to 40 degrees) is less obvious. The observers speculate the warps may be gas from intergalactic space falling into the galaxy and therefore a transient phenomenon. □

Last rocket flight for X-24B

On December 9, 1946, the Bell XS-1 (later called the X-1) became the first U.S. aircraft to fly under pure rocket power. On Oct. 14, 1947, it made the world's first supersonic flight. Six years later, the rocket-powered Douglas D-558 II was the first plane to exceed Mach 2 (twice the speed of sound), followed by the Bell X-2, which broke both the Mach 3 and the 100,000-foot altitude marks. The superstar of rocketplanes was the North American X-15, which set records that still stand in both speed (Mach 6.7—4,520 miles per hour) and altitude (354,200 feet, more than 67 miles) before it was grounded in 1968.

The only rocket-powered aircraft now known to be flying is the X-24B, built by Martin Marietta Corp. and used for research by both the U.S. Air Force and the National Aeronautics and Space Administration. Like its three most recent ancestors, the M-2, HL-10 and X-24A, the ungainly looking craft has no wings, depending instead on its body shape for aerodynamic lift in studies of controlled-reentry spacecraft and never exceeding Mach 1.9. On Sept. 23, using the same kind of engine that powered the old XS-1, the X-24B made its last powered flight.

Are more rocketplanes to come? The Air Force and NASA are considering an X-24C, with a hydrogen-fueled engine promising speeds above Mach 6, and it may come to pass. But at the NASA Flight Research Center in California on Tuesday, says one official, they had an "End-of-an-Era Party." □

U.S. Rocketplane History

Aircraft	Dates Flown	Flights	Max Speed (mph)	Max Speed (Mach)	Max Altitude (in feet)	Manufacturer
X-1 (3 planes)	1946-51	156	957	1.45	71,902	Bell
X-1A	1953-58	21	1612	2.435	90,440	Bell
X-1B	1953-58	27	1282	1.9		Bell
X-1D	1953-58	1	subsonic			Bell
X-1E	1955-58	26	1471	2.2	73,458	Bell/NASA
X-2 (two)	1955-56	20	2094	3.20	126,200	Bell
D-558 II (two)	1948-56	161	1291	2.005	83,235	Douglas
X-15 (three)	1959-68	199	4520	6.70	354,200	Rockwell Int'l.
M-2 (two)	1966-72	43	1064	1.675	71,501	Northrop
HL-10	1966-70	37	1228	1.861	90,303	Northrop
X-24A	1969-71	28	1036	1.60	71,400	Martin Marietta
X-24B	1973-75	29	1158	1.752	74,132	Martin Marietta