

Breast tumors guide treatment strategies

Within ten years of surgery, half of all breast cancer patients return with cancer spread throughout the body. Drug therapy after mastectomy may prevent some of these recurrences. But how can physicians decide which patients to treat and what type of medication to use? William L. McGuire of the University of Texas in San Antonio reports recent advances in using sound biochemical principles to determine treatment strategies both after mastectomy and for advanced breast cancer.

Cancerous cells infiltrating the axillary lymph nodes at the time of mastectomy are a well-recognized sign that the patient is likely to have a recurrence. McGuire told science writers at the Endocrine Society Seminar in New York of an additional predictive tool. Patients whose breast tumors lack estrogen receptors, and thus the ability to bind and be regulated by that hormone, have a higher probability of cancer recurrence than those whose tumors do bind estrogen. Thus, McGuire says physicians should treat with chemotherapy mastectomy patients whose tumors lack estrogen receptors and whose axillary nodes are tumor infiltrated.

Estrogen receptors on tumor cells can also be important indicators of treatment strategies for advanced breast cancer. Hormone (or endocrine) manipulation is in some cases an effective alternative to chemotherapy. In the past, hormone levels were lowered by removing ovaries, pituitary or adrenal glands. A drug recently approved by the Food and Drug Administration will probably replace such drastic surgery. Tamoxifen, an anti-estrogen marketed by Stuart Pharmaceutical in Philadelphia, paralyzes breast tumors sensitive to estrogen. Early indications are that the effect is specific to tumors. Women taking tamoxifen have normal menstrual cycles, although their tumors regress.

With a simple hormone therapy available, endocrine treatment will probably become more important. McGuire reports two new indications of when such treatment is advisable for advanced breast cancer. Earlier research showed that only patients who have tumors with estrogen receptors are likely to respond to hormone manipulation. Most major medical centers now test breast tumors for those proteins. "The new message this year is the importance of the quantitative relationship," McGuire says. In his studies, only 6 percent of women whose tumors had a few receptors responded to hormone treatment, while 46 percent with intermediate receptor levels and 81 percent with high receptor levels responded.

An even better predictor of success of endocrine therapy is the presence of another type of hormone receptor in

breast tumor cells, McGuire reports. Because estrogen stimulates synthesis of progesterone receptors, their presence indicates that estrogen not only binds but also exerts its normal cell control. In experimental studies, McGuire finds response to endocrine therapy in 25 percent of patients with estrogen receptors only, but in 80 percent of patients with both estrogen and progesterone receptors. McGuire thus recommends endocrine therapy for patients with tumors having both receptors, and trials of both endocrine treatment and chemotherapy for patients whose tumors have only estrogen receptors. □

Antarctic yields Triassic treasures

Antarctica yields yet more treasures. A cache of 116 fossil vertebrate specimens, including several previously unreported species, is making the long journey from the icy continent back to its discoverers at Wayne State University. Combined with geological data from an accompanying Ohio State University team, the find may provide the most detailed picture yet of Antarctica 230 million years ago.

The fossils represent four groups of Lower Triassic amphibians and reptiles — no birds or mammals because none existed in that age. Nine are complete or nearly complete skeletons; another nine are nearly complete, well preserved skulls. Their good condition, plus the four to five newly discovered species, makes these fossils particularly valuable for describing Antarctic Triassic ecology, says expedition leader John W. Cosgriff.

According to Cosgriff, the unreported species belong to the group *Therapsida*, mammal-like reptiles believed to be the ancestors of mammals. Some of the fossils are the size of a deer or a calf, he estimates. A second major group includes labyrinthodont specimens, some as large as a crocodile. These amphibians, named for their intricately infolded teeth, resembled present-day frogs and salamanders. Though therapsids and labyrinthodonts dominate the find, specimens representing members of *Cotylosauria*, the oldest known group of fossil reptiles, and *Eosuchia*, ancestors of modern lizards, were also found.

The Antarctic species were found in the Cumulus Hills, about 450 miles southeast of McMurdo Station, the United States' main scientific post, and 300 miles north of the South Pole. The same species have been found in Africa, Australia and India, indicating that these land masses were joined during the Triassic period and supporting the continental drift theory. By correlating faunal data from other countries, researchers hope to establish the global distribution of these Triassic species and determine where barriers to mi-

gration may have existed.

The Cumulus Hills site was spotted during a much broader 1970 Ohio State University venture. Having a general picture of the area, the Wayne State-Ohio State team thus knew just where to go to fill in the details, explains James W. Collinson of Ohio State's geology department. Collection of the samples was easy pickings because the area is made of dissected plateaus that expose the continent's stratified geologic history. Collinson and his team, Kenneth O. Stanley and Charles Bavra, simply scaled the cliffs, picking surface samples on their way. Cosgriff, graduate students William Hammer and John Zawiskie and Noel R. Kemp from the Tasmanian Museum in Australia collected the fossils during seven weeks of field work.

Preliminary work indicates that the area was a floodplain or braided stream deposit. (A braided stream is one that doesn't completely fill its channel and breaks up around bed deposits.) According to Cosgriff and Collinson's faunal and geological data, the area was temperate to subtropical, though not very humid, during the Triassic period. Considerable vegetation grew along the stream bank where only scattered lichens are prevalent now. The cold-blooded species could not have survived the Antarctic cold and six dark months without food, so the researchers believe the South Pole was not close to the area at the time. Fresh volcanic evidence also leads Collinson to believe mountains and volcanoes lay somewhere to the west of the Cumulus Hills area. □

Viking orbiter 2: Nearing the end?

In the design of the Viking 2 orbiter, as in that of its Viking 1 twin, it was specified that the Mars-bound craft should have an operating lifetime of at least 510 days, including 370 for the flight from earth. It is now approaching 1,000, and there are plans to use it all the way into 1979. But there is trouble: The doughty vehicle has been beset by a succession of leaks in its supply of steering gas. The result could be its abrupt and untimely demise.

Without the gas to fuel the jets that control its orientation in space, the orbiter would no longer be able to keep its solar panels aimed at the sun for power, its scientific instruments aimed at Mars, or its antennas aimed at earth and Mars for communications. It could only drift uselessly, unable to fulfill its mission, report on its condition or even respond to commands to help itself.

The orbiter has two control-gas systems, which were being used in tandem until last November, when a leak in the yaw axis of system 2 prompted flight controllers to entrust the craft to system 1 alone. Then leaks began to appear in *that* system (SN: 3/11/78, p. 149), but they were