BREAST CANCER

Army Doles Out Its First $210 Million

The Army is used to traversing mountains. But even experienced troops might balk at climbing this one: 2700 grant proposals averaging 60 pages apiece, copied 20 times—3 million sheets of paper, enough to fill a half mile of shelving in a warehouse at Fort Detrick, Maryland. Those are the dimensions of what may be the largest single peer-reviewing effort the U.S. Army has tackled—a breast cancer research program, created with a $210-million windfall from Congress in 1992. "The logistics have been a challenge," concedes Colonel Irene Rich, the program's director since March. But last week, with a touch of pride, the Army finished its year-long slog over a mountain of paper and announced 433 winning proposals.

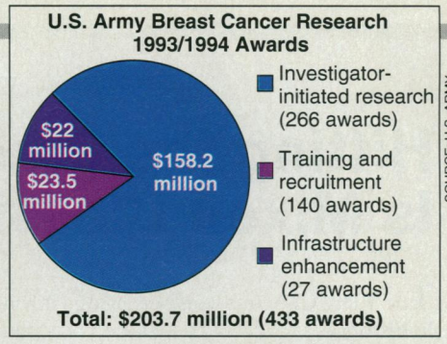
Scientists, even those who have said they would prefer to see the money channeled through the National Cancer Institute (NCI), are welcoming the results, which are heavily weighted toward investigator-initiated projects in basic cancer biology. Frederick Becker, a member of NCI's National Cancer Advisory Board and research chief of the M. D. Anderson Cancer Research Center in Houston, says he's "buoyed" by the award list. "These are really good projects. ... and the mix of people seems to be remarkable—some very well-known names but a lot of people I would have to guess are young or middle-level scientists," Becker says.

Becker's opinion is significant, given that some scientists had been concerned about how the interests of scientists and breast cancer activists would be balanced after the National Breast Cancer Coalition (NBCC), an advocacy group composed mostly of breast cancer survivors, got Congress to put the funds in the defense budget. Others worried that the money would go for mammography equipment rather than for basic science. But those fears were eased when the Army reacted favorably to an Institute of Medicine (IOM) study that recommended spending the bulk of the money on peer-reviewed biomedical research (*Science*, 21 May 93, p. 1068).

The Army then solicited proposals, and last winter, a contractor scrambled to organize 615 reviewers into 41 study sections to gauge the scientific merits of 2680 submissions. A 19-member integration panel organized by the Army narrowed the list to 408 winners. At least 25 more proposals on a wait list will be funded with the $24.2 million Congress gave the program for 1994.

The final breakdown matches the IOM plan quite closely. Investigator-initiated research grants make up 78% of the awards, with one third in genetics and the remainder spread among molecular biology, clinical, psychosocial, and etiological projects. Topics range from sequencing breast cancer genes to the role of radiation in causing breast cancer to a study of the cancer's effects on Puerto Rican women. Also following the IOM closely, another 12% will pay for training grants to support graduate students, postdocs, and midcareer scientists who want to switch to breast cancer studies. The remainder will fund "infrastructure" projects such as tissue banks and information networks. (About 7% of the total was spent on administration.)

Breast cancer activists also seem to have received much of what they wanted, according to University of Maryland epidemiologist Kay Dickersin, who is an NBCC board member, a breast cancer survivor, and a member of the integration panel. Dickersin says the Army has been "excellent to work with," and that the awards meet the expectations of NBCC. But, she says, next time her group would encourage more psychosocial and epidemiologic proposals. In addition, it wants activists to be included in the study sections, not just the final integration panel.



Following orders. Distribution matches plan drafted by the Institute of Medicine.

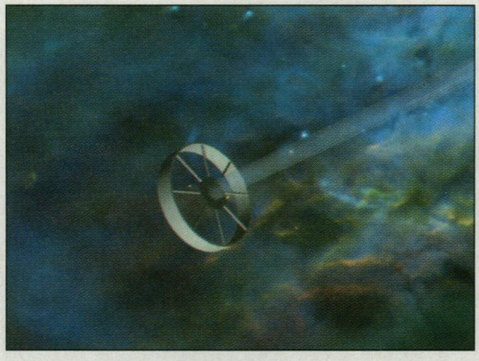
And it seems there will be a next time. Two weeks ago, Congress allocated $115 million in the Army's 1995 budget to begin the proposal process anew. That came as a surprise to researchers such as Becker, who thought the Army program was one time only. But "we didn't," says Dickersin. "The importance is, this is a whole new pie."

–Jocelyn Kaiser

SPACE EXPLORATION

Visionaries Swap Pointers on Star Flight

Most space scientists spend a lot of their time worrying about how to get their instruments into orbit around Earth. But a small band of nearly 100 scientists, engineers, and visionaries who gathered at New York University (NYU) in late August had a much bigger problem on their minds: how to fly a robotic probe to a nearby star. They discussed dozens of strategies—many, they argued, only just beyond current technology—and some daunting hurdles the venture would face.



High hopes. Riding a particle beam to the stars.

Perhaps the biggest technical problem is a kind of Catch-22: A craft small enough and fast enough to satisfy the propulsion experts may be too small to send a detectable signal back home. And in interstellar flight, even small and fast does not mean cheap. But this was not a defeatist gathering. "There has been incremental advance in every aspect of this field," said Edward Belbruno, the University of Minnesota research associate who organized the meeting with support from NYU, the United Nations, and the Planetary Society. Added Lawrence Livermore National Laboratory physicist Jordan Kare, "We are within striking distance of proposing a precursor mission" that would fly beyond the solar system, if not to a nearby star.

To have any chance at all with funding agencies, participants agreed, a mission to the stars must last no longer than 50 years, so that prospective funders and participants would have some chance of seeing the results. Reaching a star such as Tau Ceti (11.4 light-years away) or Barnard's Star (6 light-years) on that schedule would mean traveling at up to a third of the speed of light. And that implies a probe weighing no more than a few kilograms.

Thanks to advances in microelectronics and sensor technology, building an instrument package that small may be a feasible goal, said Kare, who helped develop sensors for the lightweight Clementine mission to the moon and is now working on a Pluto mission called the Pluto Fast Flyby. And the propulsion system that accelerates the craft need not add much weight—because most or

ILLUSTRATION BY ED BELBRUNO AND DAERON MEYER / THE GEOMETRY CENTER

*Practical Robotic Interstellar Flight: Are We Ready? 29 August–1 September.