CRADA fever has struck hardest at the cancer institute, which records a total of 60.

Adler notes that the second measure of NIH's bent for technology transfer is the patent count. That too is climbing. In 1987, the institutes filed 90 patent applications. In 1988, 150 were filed. This year, there will be more than 200. In Adler's opinion, prompt patent filing is an important part of NIH's effort to keep communications open. Once a patent is filed, all pertinent data are public.

Cancer institute director Samuel Broder shares the view that quick patent filing is the answer to disclosure issues. "People are worried that if they talk too much about their CRADA research, they may inadvertently disclose proprietary information and be sued by the company. The ideal thing is to file a patent quickly and then fully disclose everything right away," Broder told *Science*.

Broder sounds enthusiastic about the advent of CRADAs. "Invention is in the American psyche," he said, and CRADAs encourage researchers to find useful applications for their work. "AZT [the AIDS drug] would never have become available without industry collaboration," he says.

Indeed, there is considerable enthusiasm for CRADAs, especially among NIH scientists who have them. Thomas Kindt of the allergy institute has been working with the gene for CD4—the protein that regulates the entry of HIV (human immunodeficiency virus) into cells—and wanted a good animal model for studying CD4 gene expression in lymphoid tissue. After reading one of Kindt's early papers, people from a Massachusetts company that makes transgenic animals called to propose a collaboration. They would make rabbits with the human CD4 gene, using their expertise at creating transgenic animals. Kindt would have the animal model he needed.

Says Kindt, "This is a nice, focused collaboration and provides my lab with resources we needed. I don't have the facilities for making rabbits." It does not cost Kindt a thing—the company pays for the breeding and care of the animals. And what does it get in return? The possibility that the rabbit will, in fact, turn out to be a good model for studying AIDS. Then, the company could make money selling these genetically special animals to people studying AIDS or testing AIDS drugs.

What would Kindt have done 3 years ago, before CRADA fever? He would have gone "hat in hand" to colleagues in academia who do research with transgenic animals. "I would have been asking for a favor," Kindt says, "and even if someone agreed, making animals for me would not necessarily be a top priority. With a CRADA I have a true collaboration."

Richard Jed Wyatt of the National Institute of Mental Health is another investigator who has made use of a CRADA to get needed research rabbits. A neuroscientist interested in how the AIDS virus gets into the brain, Wyatt began collaborating with a colleague at NIH who had developed an animal model. But she did not have facilities for breeding and keeping rabbits. Neither did Wyatt. The solution: find investors to form a company that can make rabbits. Wyatt did and RRI of McLean, Virginia, was formed. Then Wyatt and his colleagues signed a CRADA with RRI. The researchers have their rabbits, the company has a possible product. Another good deal.

But traditionalists worry. If CRADAs become common, will they really be true collaborations with intellectual, scientific input from both sides? Or will they just be another form of contract—one in which NIH benefits without having to pay?

Conversely, could CRADAs eventually turn NIH into little more than a giant contract lab if companies lure NIH scientists into cooperative agreements that serve the companies' need for NIH brain power at the expense of basic research?

Jonathan Eberhart, a long-time NIH scientist who is now a senior adviser to the director, has expressed concern about this. He would like NIH to eliminate liaisons with industry, leaving it free to concentrate on basic research without "commercial distractions." Martin Gellert, another long-time NIH scientist, also worries that CRADAs may simply invite companies to "shop" at NIH for research they want done. And NIH deputy director Joseph E. Rall fears that CRADA fever will irrevocably change the NIH culture because emphasis on the quick development and application of technology is "bound to influence scientists."

On that point, no one could argue. But the key question is whether that new influence will be ultimately beneficial, as the sponsors of the technology transfer act believe, or whether in the rush to transfer research ideas to the bedside and the marketplace something vital will be lost.

What is certain is that the future is going to be different. In 1983, just 5 years ago, Health and Human Services Secretary Margaret Heckler had this to say during a visit to the campus: "NIH is an island of objective and pristine scientific research excellence untainted by commercialization influences." She could not say that today.

■ BARBARA J. CULLITON

Gene Mappers Meet on Strategy

"It's almost unique in science to do something like this," says Norton Zinder, chairman of the National Institutes of Health (NIH) Human Genome Advisory Committee, speaking of last week's "retreat" at Cold Spring Harbor's Banbury Center, where a small group of research leaders got together on 28 to 30 August to plan the future of the U.S. genome project.

The meeting was unencumbered by the usual bureaucratic constraints. There was no formal agenda, reporters were banished from the room, and attendees were told to roll up their sleeves and get down to business.

Participants included members of the NIH and Department of Energy genome advisory committees as well as staffs of the two agencies and some additional invited scientists. Agency staff will use the ideas generated at the meeting to write a plan that will be presented formally to the two agencies' advisory committees later this year, and then submitted to Congress next February.

"I think it's going to be a fairly non cohesive draft based on the discussions we had," says Benjamin Barnhart, head of the DOE genome office. Zinder agrees: "You really can't plan because you never know when a new, good idea is going to come. And to have a new, good idea presented right in the middle of a planning meeting is really exciting." That seems to have happened last week when a new approach for physical mapping of chromosomes came out. The meeting centered on a technique called polymerase chain reaction (PCR) which amplifies sections of DNA. The idea is to place tagged probes along the length of a particular chromosome and use these as starting points for PCR to generate the intervening fragments. "The more [tagged probes] you have on a chromosome, the better the map," says Barnhart. Although this concept is brand new, he says scientists at the DOE genome centers are anxious to try it right away.

As always, future plans depend on money. Congress appears likely to reduce by some $40 million NIH's $100-million budget request for the genome project. DOE's genome budget looks safe at $27.6 million—the amount the agency requested.

■ JOSEPH PALCA