US biomedical research

Hughes money talks volumes

Washington

In 1975, the Howard Hughes Medical Institute spent less than $3 million on biomedical research. Today the annual expenditure is more than $200 million, and will exceed $300 million by the end of the decade. The institute is now a major national player in the field, and one that is bringing about a fundamental change in how US biomedical research is conducted. As might be expected of an institute with a distinctive formula for supporting research, it has not gone uncriticized.

The rapid expansion has gained pace in the past two years, since the institute's board of trustees decided to sell the Hughes Aircraft Company, of which it was the sole owner. The company was sold on 4 June 1985 to General Motors for around $5,000 million. Since then, the institute has embarked on a massive expansion of its research labratories, improving facilities at existing laboratories and negotiating to provide space for new ones. The two most recent are at the University of California at Los Angeles and at Rockefeller University in New York, bringing the total to 22.

At present, Hughes laboratories have by law to be associated with a hospital or some equivalent institution. Some researchers have expressed concern that the very size of Hughes' resources could cause an undesirable 'brain drain' from non-clinical to clinical research centres. Academic biologists at non-clinical institutions fear that Hughes policies could lead to a resurgence of the 1960s dominance of biomedicine by physicians. But according to the institute's president, Dr Donald Fredrickson, former head of the National Institutes of Health (NIH), things may soon change. The institute has been wrangling for much of this year with the Internal Revenue Service on the interpretation of its legal obligation to be engaged in the "direct active conduct of research" in conjunction with a hospital. Fredrickson thinks that that definition, which dates back to the 1950s, may not be applicable to today's conditions.

Another fear sometimes voiced by academics is that Hughes, by generously supporting large laboratories at a few select institutions, could distort research by creating 'black holes' into which many of the best scientists would disappear, never to be seen outside again. So Hughes, anxious to avoid such criticisms, plans to spread its influence wider and thinner than in the past, by establishing 'mini-laboratories' comprising one or a handful of investigators. And, depending on the outcome of the legal arguments, Hughes hopes to become an important supporter of research students. Already, a small programme is in place that sends 35 medical students each year to get research experience at NIH.

Because Hughes money is concentrated in specific research areas — and fashionable ones at that — its influence in them is proportionately greater. Research so far has been principally in genetics, immunology, neuroscience and cell biology and regulation; Hughes is also taking the lead in supporting several databases of genetic maps. But it now plans a major expansion of its support for structural biology.

The controversy Hughes money is stirring in the research community is at least in part because of the peculiarly generous terms under which support is offered. Recipients are selected on the basis of track record only; not even a research proposal has to be submitted. But once a researcher becomes a Hughes Investigator (necessary because of legal niceties attached to the institute's status as a Medical Research Organization rather than a foundation), Hughes pays salaries and meets all research costs for up to seven years before renewal. Even postdoctoral researchers can expect an unhindered three years' support. And a Hughes investigator is completely free to pursue his own interests, provided annual reviews approve continuation of support.

Hughes also provides equipment for its laboratories over and above that required for its own employees, so there is spare capacity for use by other researchers at the host institution. Expensive items such as automated DNA and protein sequencers are now being bought by Hughes at quantity discounts. Small wonder that most of those approached have no hesitation about accepting a Hughes offer: NIH cannot approach that sort of support.

Fredrickson says Hughes goes out of its way to avoid disrupting normal academic life. Salaries are the same as would be paid normally by the host university or hospital, and though Hughes investigators must have their own research space, collaboration with others is encouraged.

Researchers who are not fortunate enough to be supported from Hughes' bottomless moneybag may therefore be competing year by year for NIH research grants alongside carefree Hughes researchers doing work of comparable importance and quality, a potentially explosive situation. Conflicts over grant support might in future force NIH to start taking account of who is receiving Hughes money in their own funding decisions, according to Stuart Orkin of Children's Hospital Medical Center, Boston, a new Hughes investigator.

Both Hughes and government research officials stress that there is no deliberate competition between the institute and NIH. But Hughes is now undeniably so important a player that all government agencies are having to watch what it is doing.

The sole criterion for supporting a project, Hughes says, is academic excellence, with an emphasis on the unconventional. Hughes' decisions seem likely to be major influence on the development of biomedicine for the rest of the century and beyond.

Tim Beardsley

Engineered organisms

Keeping track of the wild

Washington

US administration officials are planning a new computer database to provide information for evaluating environmental releases of genetically modified organisms. The information would be available to both researchers and government agencies working on what has become the most vexed regulatory issue in biotechnology.

The idea is to devise a system that would allow rapid access to information on species introductions and microbial interactions already available in the ecological and agricultural literature. In the process it is hoped the exercise would indicate the kind of new research that is most needed.

The plan, which has not yet been approved, has been put forward by a subcommittee on research needs of the Biotechnology Science Coordinating Committee, based in the White House's Office of Science and Technology Policy. The problem at the moment, according to David Kingsbury, chairman of the committee, is that "we don't know what we know".

The proposal has been discussed with the National Library of Medicine. The library has extensive experience running a database called TOXNET, which stores information on 4,000 hazardous chemicals. According to Dr Dan Masys, director of the library, the data structures and methods of interrogation devised for TOXNET could be adapted easily to environmental release of altered organisms.

The library has ambitions of its own to develop databases relevant to the new biotechnology, possibly in the future linking environmental and molecular biology data in the same system. Such a scheme is still a long way off, but there is growing interest in the idea; the Howard Hughes Medical Institute, among others (see above) is interested in a similar grand linkup of databases. In the meantime, a meeting of information specialists is planned to discuss the environmental database proposal before next April.

Tim Beardsley