Industry Readies for Interferon Market

Spurred by signs of clinical success, a number of groups are pumping additional millions into the manufacture and clinical testing of interferon, the protein produced by virus-infected cells that fends off viruses and apparently some types of cancer. G. D. Searle & Co. of Chicago announced on 4 March that it will soon begin the largest clinical trial yet of fibroblast interferon, a type not yet extensively studied. Searle and Abbott Laboratories of Chicago have separately announced plans to boost production of the drug.

The American Cancer Society (ACS), meanwhile, announced on 25 February that it will add $3.4 million to a study of leukocyte interferon, in which it has already invested $2.4 million. The additional dollars will enable the society to more than double the number of patients, now 150, being treated. Saul B. Gusberg of Mount Sinai School of Medicine, the national president of ACS, said [in a statement] that results of the clinical trial so far were "promising." He added that "the unprecedented size of the society's appropriations for interferon is due to the very high cost of the material. There is little expectation that much less expensive material will become available for research purposes in less than 2 to 3 years."

Lured by the potential market, more than a dozen firms are now planning to make one or more of the several kinds of interferon, according to Nelson Schneider, a drug industry analyst for the investment firm E. F. Hutton. Initial investments already may have reached $100 million, he said. "If the drug works the way some people think it does, you could be talking about the forerunner of a line of products with an impact like antibiotics, which has a $15 billion market worldwide with a lot more than a dozen companies involved." Leukocyte interferon, made from white blood cells from blood donors, costs about $50 per million units. A daily dose costs about $150 and a course of treatment can run to $30,000. Although much of the $3.4 million will go for purchase of additional interferon, ACS expects that "substantial amounts" will go into projects aimed at purifying the material and increasing its production.

Daniel Azarnoff, senior vice president of Searle's research and development division, said the company hopes to make fibroblast interferon at a cost of only $25 per million units. Beginning in about a month, Searle will test the drug on 30 cancer patients at M. D. Anderson Hospital and Tumor Institute in Houston, Texas.

A Cramp in Fermilab Style

Robert Wilson, who designed and built the Fermi National Accelerator Laboratory at Batavia, Illinois, always prided himself on the aesthetics of the place. The main body of the accelerator, which runs through a 4-mile tunnel, is painted bright red, blue, and yellow. Over the main entrance to Fermilab is a 30-foot-high sculpture that Wilson made out of scrap iron from the deck of a decommissioned battleship. Now, under pressure from the Department of Energy (DOE), the Wilson tradition is suffering something of a setback.

J. K. Mansfield, DOE's Inspector General, in a 14 January report to DOE Secretary Charles Duncan, said a 1976–1977 audit indicates the lab spent at least $47,000 in federal funds on such "aesthetics and amenities" as stained-glass elevator ceilings and jewelry for retiring employees. "It is fundamentally wrong for DOE to fund amenity-type projects of the kind discussed in our report," Mansfield said in an accompanying letter. The letter contrasted the situation at Fermilab with conditions at the nearby Argonne National Laboratory at which, he reported, "There are extensive leaks in many of the roofs of the prefabricated buildings that dot the Argonne site."

The DOE report listed the following expenditures by Fermilab officials: $11,965 for stained-glass elevator ceilings, $9,819 for a conference table, $7,310 for a dining table, $4,340 for jewelry, and "various plaques and personal gifts totaling about $3,700."

Leon Lederman, who now directs Fermilab, says he has now clamped a $15,000 ceiling on "aesthetics and amenities" and has cut back on the staff of the Fermilab model shop, where many of the amenities were produced. But he made it clear that the Wilson tradition is not dead.

"The lab must be a place of beauty," he said, "both to attract scientists and to relate to people who come for sightseeing. They're the taxpayers.

Leon Lederman

It's their money. It's not easy to explain what we're doing. It's an abstract program so it is important to know that science and aesthetics are related."

In any case, he added, "I think the bookkeeping made it look much worse than it was and that's why the Department of Energy didn't really come down on me hard, because they understood it. And then I promised I would monitor the thing more closely and try to err on the side of austerity."

A Bank for Nobel Sperm

"I'm very excited about this," wrote one of the women. "I'm tentatively going to select Number 13 because he is the youngest of the donors and has the highest IQ."

Number 13 is one of five Nobel prize winners who have contributed to a sperm bank founded by California business tycoon Robert K. Graham. Three women, according to a front-page story in the 29 February Los Angeles *Times*, are now pregnant after being artificially inseminated with Nobel sperm.

Graham, 74, a developer of plastic lenses for eyeglasses, was a friend of the late Hermann J. Muller, who won the Nobel prize in 1946 for his work in genetics and who advocated sperm banks for famous, exceptional people—not just Nobel prize winners. After Muller died in 1967, Graham began to write Nobel laureates, asking

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for sperm donations. Five said yes, and Graham made collections in the San Francisco and San Diego areas for the Hermann J. Muller Repository for Germinal Choice, as he calls his subterranean sperm bank on his 10-acre estate in Escondido, California.

The only Nobel prize winner who has so far admitted having his sperm on ice is William B. Shockley of Stanford University, who shared the Nobel Prize in Physics in 1956 for work on the development of the transistor. "I don't regard myself as a perfect human being or the ideal candidate," he says, "but I am endorsing Graham's concept of increasing the people at the top of the population." Shockley, who has written several controversial papers suggesting that blacks are genetically inferior, has also backed negative eugenics. In an address to the American Psychological Association, for instance, he proposed that the government pay $1000 for every IQ point below 100 to welfare clients willing to submit to sterilization. This, he said, would shrink welfare rolls within a generation.

Many observers take a dim view of Graham's project, not the least of which is Thea Muller, the widow of Hermann J. Muller. She has demanded that the California sperm bank stop using her Nobel-winning husband's name. In 1971, she rejected a request from Graham for permission to name the sperm bank after Muller. "I wrote him saying I could not agree," she says, "but he's done it anyhow. The program has fallen into the wrong hands." She says her husband discussed with Graham the idea of a sperm bank emphasizing not only a donor's intelligence but also his "human" traits. She says, however, that he dropped out of the venture when the principles could not be agreed upon, and she now feels the program has been given the wrong slant.

Pressed by reporters, laureates across the country have expressed a variety of views on the Nobel sperm bank, the most frequent seeming to be bemused indifference. "On one hand," says Howard Temin, who won the 1975 Nobel prize for his work in genetics, "genes may directly control personality, and therefore progeny of Nobel laureates will be equivalent to Nobel laureates—which would be awful. Who would want a world full of such people? On the other hand, genetics may have nothing to do with it—so why bother? In either case, it's a no-win situation."

Do the children of Nobelists in fact ever amount to anything? Many, of course, do not. But there are at least five sets of laureate parents and offspring on the Nobel roster. In 1975, Aage Bohr won the Nobel Prize in Physics, while his father, Niels, did the same in 1922. In 1970, Ulf von Euler won the prize for his work on the chemistry of nerve impulses. His father, Hans von Euler-Chelpin, won the prize in 1929 for his research on the chemistry of fermentation enzymes. In 1937, the English physicist G. P. Thomson won the prize for his work on the diffraction of electrons by crystals, while his father, J. J. Thomson, received the prize in 1906 for work on the conduction of electricity through gases. In 1935, Irene Joliot-Curie shared the prize in chemistry with her husband, Frederic Joliot, for synthesizing new radioactive elements, while her mother, Marie, received the prize not only in 1911 in chemistry, but also with her husband in 1903 for discovering radioactivity. And finally, the father-and-son team of W. H. Bragg and W. L. Bragg won the prize in 1915 for their work on studying crystal structure by means of x-rays.

All of which, of course, says little about how children reared away from the intellectual and social influence of their Nobel parents will grow up. And there are other unknowns. Nobel sperm may be bright, but the donors are usually far along in years. Shockley, for instance, is 70, and recent studies suggest that the chance of having a Mongoloid child increases not only with the mother's age, but also with the father's. Then too, brighter may not necessarily be better. "There is no guarantee that high IQ people produce better people or a better society," says Daniel Callahan, director of the Hastings Institute of Society, Ethics, and the Life Sciences. "It is not the retarded kids of the world who produce the wars and destruction."

Despite mixed reviews, at least Temin has found a bright side to the Graham episode. "The world," he says, "can't be in such bad shape if a thing like Nobel sperm banks makes front-page headlines. Usually you only get something like this in the dog days of August. Maybe things aren't as desperate as I was afraid they were."

William J. Broad

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ken says, after observing so many similarities, that it is tempting to conclude that "native ability will show itself over a broad range" of backgrounds. So either a seriously impoverished or a greatly enriched environment is required "to significantly alter its expression."

Such an idea, if it gained broad acceptance, would have major impacts on social policies. But Bouchard wants to keep his study separate from politics, emphasizing instead that the research is "very much exploratory."

The data, once assembled and analyzed, should provide a gold mine of new hypotheses. If a great many pairs of twins are collected, says Bouchard, they may be able to present the findings quantitatively; otherwise, the findings will be in the form of case histories. Tellegen, however, whose main interest is the methodology, says "we want to invent methods for analyzing traits in an objective manner, so we can get statistically cogent conclusions from a single case." He points out that psychoanalytic theory was developed from intensive study of small numbers of people and that behavioral psychologist B. F. Skinner similarly was able to develop his theories by studying small numbers of animals. Take the twins with the identical headache syndromes: with just one pair of twins the door is opened to a new field of research.

The twin study may also make it clear that estimating the relative contribution of heredity and environment to mental and psychological traits can never be boiled down to percentages. Some people, for example, may have authoritarian personalities no matter what their upbringing; the authoritarianism of others may be directly traceable to their environment. Similarly, with intelligence, some people may be smart or dumb regardless of outside influences, whereas the intelligence of others may be extremely malleable. Theoretically, variations from individual to individual in malleability and susceptibility may be so great that any attempt to make a generalization about the relative contribution of "innate" characteristics to a certain trait across a population would have no meaning.

Twin studies have been regarded with suspicion in some quarters because, according to Gottesman, the behavioral geneticist who worked with James Shields in England, they were "originally used to prove a genetic point of view." The most notorious of these were the studies of Cyril Burt on intelligence of twins reared separately, which were sub-