Pronuclear Microinjection Produces Transgenic Animals For Research

Ohio University

Research facilities throughout the country are benefiting from the work of Ohio University's Thomas E. Wagner, Ph.D., and Peter C. Hoppe, Ph.D., from the Jackson Laboratory in Bar Harbor, Maine. In the early 1980s, the scientists made groundbreaking history when they were among the first to demonstrate successful gene transfer in laboratory mice and transmission of the "transgene" to offspring. The process has since been applied to animals outside the laboratory, from rabbits to cattle, for a wide variety of purposes. Development of the technology was initially funded through the support of Ohio University and the state of Ohio.

Two U.S. patents were issued on the technology (U.S. Patents 4,873,191 Genetic Transformation of Zygotes and 6,872,868 Transgenic Mammals), which were exclusively licensed to a succession of licensees and extensively

sublicensed to biotechnology and pharmaceutical companies, among other commercial users. At least 242 U.S. patents cite the first patent, a dramatic measure of its impact on other patentable inventions.

The Wagner-Hopper work showed that genes could be transferred through the injection of DNA when an animal was still a one-cell embryo, which then could lead to the production of a functional protein and ultimately be passed on to subsequent generations.

> *The innovative platform technology, called Pronuclear Microinjection, has produced transgenic animals, especially mice, for academic research as well as for commercial applications.*

The technology has been used to make transgenically produced biopharmaceuticals, proteins and xenografts, and literally thousands of research models of benefit to society.

Transfer of the technology spawned one of the early examples of a startup company based on university technology and was the foundation for the creation of the Edison Biotechnology Institute at Ohio University. The institute retains this early emphasis on technology development and transfer and has been the source of platform technologies for a number of companies and products currently on the market.

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