

# **SOUTHWESTERN NEWS**

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## **EMINENT EMBRYOLOGIST TO HEAD NEW RESEARCH EFFORT AT UT SOUTHWESTERN**

DALLAS -- March 25, 1994 -- A top research scientist from the National Cancer Institute is moving his lab and two of his research associates to The University of Texas Southwestern Medical Center at Dallas. Dr. Luis F. Parada will head the newly established Center for Developmental Biology at UT Southwestern.

Basic research conducted in Parada's labs could lay the scientific groundwork for clinical advances in cancer treatment and paralysis.

Parada's research has focused on the development of the nervous system in higher organisms, particularly on the role of cancer genes during normal embryonic development.

"There are many parallels between early embryogenesis and tumorigenesis," the professor of cell biology and neuroscience said. "Both begin with one cell making multiple cells, directing the processes of proliferation and differentiation. In development it is highly organized, while in cancer it is disorganized. Our somewhat simplistic hypothesis was that the genes that show up as dominant role players in tumorigenesis may in some cases be the same genes that regulate development in the embryo. To some extent, this simplistic idea has turned out to be partially true."

The key, he said, is in the way the mammalian nervous system develops before birth. Initially excessive neurons are produced, followed by selective paring of the extraneous ones through a complex process of programmed cell death.

As head of the molecular embryology section of the NCI's mammalian genetics laboratory, Parada directed research into the signaling mechanism that tells nerve cells whether to survive or die, work that led to the discovery of the

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genes for corticospinal tract receptors whose ligands, the neurotrophins, interact with them to signal a nerve cell to survive.

"Ironically, the same signal that tells an embryonic cell to survive can tell a cancer cell to proliferate," the researcher said.

Nerve cells, unlike most other kinds of cell in the body, are formed in the embryo and stay with the animal through most of its life span. "Each neuron lives as long as the organism," Parada said. "That's why their survival mechanism is so interesting and significant."

Dr. William Neaves, dean of Southwestern Medical School, said: "The search committee chaired by Dr. Mike Brown served UT Southwestern exceptionally well in its choice of Dr. Luis Parada. Not only does Dr. Parada fulfill the committee's mandate to recruit the best person to head a new developmental biology program on campus, he also adds substantial strength to other designated priority areas such as neuroscience and cancer biology. Dr. Parada is a gifted and creative scientist whose basic research will influence many fields of medicine."

At UT Southwestern, Parada's research will focus on the molecular and genetic mechanisms that regulate the development and survival of nerve cells and the formation of organs in the embryos of mammals. His special interest is proto-oncogenes -- genes with normal biological functions that can become oncogenes and cause cancer when they function abnormally.

Parada's research eventually could lead to new and effective treatments for neurological trauma or disease and cancer. But his primary interest is in the underlying molecular and genetic mechanisms of normal embryonic development. "I'm interested in why and how development happens," he said. "That's why I'm a scientist."

"The essence of science is trying to understand how things work, but it is extremely important for people to understand that basic research is the intellectual driving force for ongoing medical advances. While a headache can be

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treated with an aspirin, truly understanding what causes the headache will allow more effective treatments to be developed."

Other researchers already are applying Parada's discoveries about the embryonic nerve cell's survival signaling mechanism to the clinical puzzle of nerve regeneration. And Parada says there's more to learn.

"TRK receptors and their ligands, the neurotrophins, aren't by any means the end of the ballgame," the researcher said. "We'll continue to search for novel neurotrophins, novel receptors, even novel mechanisms. We try to keep a very open perspective, or we might miss something. That's one of the primary differences between basic and applied research. We don't want to get too caught up in the application of neurotrophins to nerve regeneration, for example, because maybe there's something even better to be uncovered."

One of Parada's specialties is developing genetically altered mouse models to help researchers understand exactly how various neural pathways develop. The mouse models are a powerful tool for improved understanding of human disease.

Two of Parada's colleagues at the NCI will join him as research associates at UT Southwestern. Dr. Kris Vogel is a developmental neurobiologist with a long-standing interest in the survival of sensory neurons. Dr. Jussi Merenmies specializes in neurotrophic factors and the molecular biology of cell regeneration.

Parada's developmental biology research will be housed in the Simmons Biomedical Research Building on UT Southwestern's new North Campus. The researchers look forward to creative interaction with neuroscience and cancer researchers who work elsewhere in the building. "We anticipate a very synergistic working environment," Parada said. "That was one of the features that attracted me to UT Southwestern."

Parada studied molecular biology at the University of Wisconsin, Madison and earned a doctorate in biology from the Massachusetts Institute of Technology. He did postdoctoral fellowships at the Whitehead Institute in Cambridge, Mass., and at the Pasteur Institute in Paris.

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