Background information on Don Helinski, Director of Center for Molecular Genetics

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DON HELINSKI: SOCIETY TO BENEFIT FROM GENE MANIPULATION

Donald Helinski, director of the Center for Molecular Genetics at the University of California, San Diego, has no doubt that this new field is going to change the way we live during the coming decades.

"It is the most explosive, the most exciting, dynamic and changing field right now," says Helinski, a molecular biologist whose profession didn't even exist when he was a graduate student in the late 1950s at Case Western Reserve University in Cleveland. "It's going to have tremendous social impact as far as the human product that will be used to treat disease. Its implications in terms of biomedicine are profound and will continue to be so."

Helinski joined the UCSD Department of Biology in 1965 after serving as a post-doctorate fellow at Stanford and on the faculty at Princeton. He is one of the principal founders of the dynamic new Center for Molecular Genetics.

The new Molecular Biology Building will bring many of the research teams in molecular genetics and recombinant DNA under a single roof and give them the space and equipment they need to probe the structure of genes, to identify the products that specific genes code for, and learn more about the regulation of gene expression.

"By coordinating activities in molecular genetics we can promote multi-lab and multi-disciplinary approaches to solving problems, and we can provide a central resource for essential technologies, facilities or equipment," Helinski said.

He listed three very promising areas in applied molecular genetics including biomedicine, plant genetics and diagnostics.

"We are carrying tens of thousands of genes--each of us as human beings," Helinski said. "There are a lot of genes out there making extremely interesting products, many of which will have pharmacological activity that can be used in therapeutics. Now that the whole gene bank is available to us, it's a matter of discovering those that are potentially very useful in medicine.

"In the plant field, there are again a number of possibilities as far as engineering plants that are nutritionally of higher quality or resistant to stress.

"The whole area of diagnostics is incredibly powerful," he continued. "For instance, it's going to have tremendous implications in regard to the identification of people who are carriers of hereditary disease or people who are destined to come down with an hereditary disease at some stage of their life."

In the area of basic research, "new techniques are allowing us to probe the structure and control of expression of genes at the detailed levels that we couldn't imagine being able to do before," he added. "So we are taking on a

whole new understanding of what makes up genes and how they work. And that's been the tremendous payoff of the area up to now."

Helinski's own research interests lie in the field of nitrogen fixation on plants.

"I'm working on communication between bacteria and plants," he says. "We know that bacteria and plants 'talk' to each other by eliciting chemicals. We're particularly interested in a bacterium which enters the root system of a plant and carries out biological nitrogen fixation."

Helinski's research is aimed at providing a natural alternative to expensive nitrogen fertilizers currently used by farmers all over the world.

"If we can better understand the biological process, we will be able to genetically modify the bacterium so that it is much more efficient in providing certain nutrients to the plant," said Helinski.

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