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Genetic analysis of human hematological malignancies rewarded

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News

This year's recipient of the Stanley J. Korsmeyer Award is D. Gary Gilliland of Harvard Medical School. The Stanley J. Korsmeyer Award, named in honor of the first recipient of this annual award, recognizes the outstanding achievements of an ASCI member in advancing knowledge in a specific field and in mentoring future generations of life science researchers. The JCI had the opportunity to speak with Gilliland about his scientific achievements and plans for the future. JCI: How did you feel when you were told that you were being awarded the 2007 Stanley J. Korsmeyer Award? Gilliland: Extraordinarily honored and humbled. The work of Korsmeyer established the paradigm that identifying the genetic basis of a disease allows you to understand its molecular pathogenesis and thereby develop rational approaches to treat individuals with the disease, and this has inspired much of my own work. JCI: You are being recognized for your contributions to our understanding of the genetic basis of human hematological malignancies. What do you consider your greatest scientific accomplishment? Gilliland: I cannot take credit for any single advancement, but I'm most proud of the contributions that my group has made to developing new treatments for cancer, including discovering the genetic basis of hematological malignancies, developing targeted therapies based on these insights, and translating this into phase I/II clinical trials. Perhaps […]

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JCI: You are being recognized for your contributions to our understanding of the genetic basis of human hematological malignancies. What do you consider your greatest scientific accomplishment?

Gilliland: I cannot take credit for any single advancement, but I'm most proud of the contributions that my group has made to developing new treatments for cancer, including discovering the genetic basis of hematological malignancies, developing targeted therapies based on these insights, and translating this into phase I/II clinical trials. Perhaps as importantly, we have relayed "bedside-to-bench" responses into an understanding of disease mechanisms. Therefore, I would view our ability for bidirectional translation between the laboratory and the clinic as our most important contribution to cancer medicine.

JCI: When and how did you become interested in hematological malignancies?

Gilliland: At graduate school in UCLA, where I worked with John Collier on bacterial toxins. We became interested in using antibodies to redirect bacterial toxins to cancer cells to destroy them. At the time it had limited applications because of the immune response induced by the antibody-toxin conjugates. However, with the advent of antibodies that more specifically target cancer cells and evade immune recognition, many of the problems we faced have been addressed and such anticancer strategies have shown considerable promise. In any case, my graduate work involved many interactions with clinicians and patients, and this interface with patients dying of cancer compelled me to be involved in translational research in oncology. To be in the best possible position to do this, I felt that it was necessary to go to medical school, and then, during my postdoctoral training, I focused on hematology and oncology. The reason I chose to focus my research on hematological malignancies specifically was largely because studying them was more tractable than studying solid tumors — it was much easier to get samples in sufficient quantities. However, it seems clear now that much of what has been learned about hematological malignancies, such as the idea of leukemia stem cells, will be widely applicable to solid tumors.

D. Gary Gilliland, recipient of the 2007 Stanley J. Korsmeyer Award.

JCI: What are your future research plans?

Gilliland: Recently my laboratory has begun studying cancer stem cells in the context of leukemia, and this will be an area of focus in the future. My interest in these cells comes from the fact that although therapeutics such as Gleevec cause long-term remission in individuals with leukemia, they do not cure the individual, and eventually the cancer returns. It is thought that cancer stem cells are resistant to the effects of current therapeutics. Therefore, defining the molecular identity of these cells should lead to therapeutic targets to prevent them reinitiating disease. One potential problem with targeting these stem cells is that we currently have little understanding of how they differ from HSCs, and our initial work has begun investigating the differences between HSCs and leukemia stem cells.

JCI: What are the biggest changes you have seen during your time in research?

Gilliland: The advances in technology have not only changed the way in which we do experiments but also the way we approach science. When I started, experiments were always designed to test a hypothesis, but now technologies such as SNP arrays and high-density epigenetic analysis should allow us to generate testable hypotheses that would have been unthinkable without these sophisticated genome-wide technology platforms. These advances mean that scientists need to be part of large collaborative networks. However, a challenge of this approach in academia is how to promote and reward such team efforts.

JCI: What other contributions to science are you proud of?

Gilliland: What I am more proud of than any of my scientific achievements is that I have had the opportunity to nurture some truly talented young scientists. It has been tremendously rewarding for me to work with absolutely extraordinary physician-scientists. I understand that my most important legacy, more important than any accomplishment I might make as an individual, will be the cadre of young investigators whose development I have supported. This is what Dr. Korsmeyer did for me, and I am honored to be able to do all that I can to pass along Dr. Korsmeyer's support and compassion to others. We would all do well to emulate him.

Karen Honey