



IN THEIR WORDS: AN EVENING WITH THE DREAM TEAMS **CAT VASKO**

On September 1, 2009, Stand Up To Cancer held a dinner preceding a day of meetings with its Dream Teams and Executive Leadership Council. The meal was an opportunity for some of SU2C's leaders to meet the visionaries behind the exciting translational science we are helping to fund. One by one, the Dream Teams took the podium to describe, in their words, their projects and their hopes for the future of cancer research.

We want to share with you some of what we learned that evening. First, Laura Ziskin, SU2C co-founder and member of the ELC, took a moment to describe the collaboration SU2C's Dream Team model aims to engender. "No one cancer organization or group, no one institution, no one scientist, not even the government is going to make a dent in the enormous riddle that is cancer," she said. "It is only by our coming together that we have a chance of impacting this disease in our lifetime. And the requirement of success is going to be your absolute unwavering commitment to work together. You are a group of teams. But you are, in fact, one team."

With those words still ringing in their ears, the Dream Teams each took a moment to talk about their work. First up was Stephen Baylin, MD, from the project *Bringing Epigenetic Therapy to the Forefront of Cancer Management*.

"This is, in a sense, a magnificent experiment," Baylin said. "But we have to remember the real heroes of this experiment: the patients. Because they're the ones that really will collaborate with us to try to get this done. So: what is epigenetics? Genes in cancer can be damaged in at least two ways. One is to damage the hard drive that makes that gene. That's the DNA. The hypothesis we have is that we can reverse abnormalities in the packaging that occurs in cancer and restore genes that would be so-called tumor suppressors. So this is where we're starting. We've had some exceptional very early success in patients with advanced lung cancer who have failed previous therapies, and that's about as difficult a challenge and starting point as you can get. And we have some responses that we've been terribly surprised by. Our challenge now is how far can we take this? How many patients? What subsets of patients with lung cancer will there be? Can we use it in other stages of the disease -- early disease? Can we extrapolate this to colon and breast cancer? And this is what we seek to do."

Lewis Cantley, PhD, spoke on behalf of his team, *Targeting the PI3K Pathway in Women's Cancers*. He told the assembled group, "I'm so excited about this pathway. I've been working on it for 20 years. We've managed to pull out information from 2,000 tumors -- breast cancers, endometrial cancers, ovarian cancers. And we found, as we already suspected, that each of these cancers had not just the mutation in the PI3K pathway, but additional mutations in other pathways. It's probably true that no two breast cancer patients in American have exactly the same mutations going on, and that's a sobering thought, but it also shows that many of them have very common mutations. And so our goal is to collect that data on every patient that goes into a clinical trial with these kinds of targeted agents and determine who's likely to respond. That will dramatically accelerate the approval of the drugs. But we also realize that no single drug is gonna cure cancer. We'll need drug combinations. And the drug combinations will have to be selected logically based on what we understand about the pathway. So that's what we're attempting to do. It's an incredibly exciting opportunity."

Joe Gray, PhD, offered a few words on his and Dennis Slamon's, MD, PhD, team's project, *An Integrated Approach to Targeting Molecular Breast Cancer Molecular Subtypes and Their 'Resistance' Phenotypes*. "I think that one of the things that Stand Up to Cancer has done is to really galvanize the entire community to think bigger and faster than we have in the past," he noted. "What this has done is it's given us a team of the breast cancer clinician scientists in the country looking at all aspects of breast cancer. We're applying the latest molecular analysis technologies to try to understand what the bones are that make up these cancers and how it is that we can actually begin to tailor the drugs that are available to individual patients. This requires management of a huge amount of data, and we've got some of the best people in computational biology and mathematics in the country to help us put all of this stuff together. We understand more and more about the biological basis of this disease. I think that this process has brought us to the point where we have a team that can quickly and boldly make a difference in breast cancer."

Craig Thompson, MD, and Daniel Van Hoff, MD, were both on hand to tell the assembled group more about their project, *Cutting off the Fuel Supply: A New Approach to the Treatment of Pancreatic Cancer*. Thompson began by saying, "We're up against a really formidable enemy. And we have to figure out new and bold ideas to attack cancer. Dan and I started up directing teams, each composed with multiple institutions, to really try and think up new paradigms to attack the most deadly of cancer killers -- pancreatic cancer. It's only recently been understood that cancer cells have deregulations of their use of nutrients in the body to be able to fuel their growth. Without those nutrients, they die. We thought there were new therapeutic strategies to approach in that."

Van Hoff added, "Our dream is a real bold one: to increase the number of survivors in the 1st year after diagnosis from the current twenty percent to eighty percent. Some people hate defined goals. It's too risky. It's too hard to hit. But our Dream Team loves goals."

Finally, Daniel Haber, MD, PhD, and Mehmet Toner, PhD, discussed their project, *Bioengineering and Clinical Applications of Circulating Tumor Cells Chip*. Haber began by describing the science behind circulating tumor cells. "What makes cancers incurable by

dissection alone is when they spread from the primary tumor to distant sites," he noted. "These circulating tumor cells in the blood are incredibly rare, so it's an engineering feat to try to pick these up. The CTC chip captures them with very high efficiency so they can be counted, they can be studied and they can be analyzed. What we've found in some cancers, particularly prostate cancers, is that some invasive cancers shed these circulating tumor cells before the cancer actually spreads. One of our biggest areas of emphasis is to collaborate among all the engineers to push the sensitivity of detection so that we can really open the gates to early detection. And the unique part about this team is really the merging of engineering, clinical medicine and biology."

With that, Toner, a biomedical engineer, added: "We have the best, brightest minds in engineering from M.I.T. joining us to develop the next generation of the chip that will get us to even broader applications of the technology, especially in early detection. The other major task we have is we need to roll out this technology to our collaborators, and it's time to do it for real. And we have done it in our laboratories at Mass General Hospital, but now we need to go beyond that. So the Stand Up to Cancer's major goal is to take the existing technology, to roll it out to besides MGH, to Dana Farber Cancer Institute, Sloan Kettering, and M.D. Anderson, and put these chips and devices in their hands. Hopefully that will get us to places where we have never been before and that will be exciting."

The evening ended with the words of Sherry Lansing, ELC member, who said, "It is you scientists who are our heroes. We place our hope and all of our dreams in you. Seeing you speak tonight, seeing you come together gives all of us hope. But this really is just the beginning. Because we really do have a big dream, that all of you will do remarkable things. And that some day because of your work, cancer will be no more."