

*“We bring the power that we have —the science and the patients — and industry brings their strengths.”*

# INNOVATION OFFICE — CONNECTS — Moffitt and Signal Genetics For Myeloma Research

INDUSTRY AND RESEARCH COLLABORATION  
HOLDS HOPE FOR MYELOMA PATIENTS

*By Nancy Christie*

*Photography: Ray Reyes*

**Developing new and better ways of treating cancer is not unlike putting together a puzzle. All the pieces have to be there and linked in the proper configuration before the picture can emerge.**

For Moffitt medical oncologist and clinician scientist Kenneth H. Shain, M.D., Ph.D., the “puzzle” centers on multiple myeloma, a type of cancer that develops in the plasma cells found in bone marrow. The second-most common hematologic malignancy/blood cancer, multiple myeloma remains a mortal disease despite numerous advances. Importantly, researchers are still seeking ways to more specifically tailor the treatment to achieve the best outcome for each patient, and they are showing marked improvements, notes Dr. Shain, who is the scientific director of the Moffitt Myeloma Working Group.

That takes both money and industry collaboration, but with the assistance of Moffitt’s Office of Innovation and Industry Alliances and the efforts of physicians such as Dr. Shain, there is hope for new advancements in the treatment of multiple myeloma.



KENNETH H. SHAIN, M.D., PH.D.

### **THE LINK BETWEEN INDUSTRY ALLIANCES AND CANCER SCIENTIFIC RESEARCH**

Although the laboratory may be where much research begins, Dr. Shain notes that industry partners are an integral part of the successful “bench to bedside” progression, especially given the reduction in government funding for the past 10 years, “which makes doing clinical research or translational research very difficult.”

For example, he says, new pathways have been identified through research that may be critical targets for different drugs. “And to demonstrate these pathways are critical, not just in a petri dish or in a flask in a lab but also clinically relevant, you need to partner with pharmaceutical companies or industry and academic centers who have therapies that might target these pathways.”

Although industry alliances have long been a part of research, Dr. Shain says, “we’re turning to it now even more so because there is this need to continue to move forward and strive to

improve our sense of understanding and our translational research. And that part of that goal aligns very well with industry.”

That’s where the Innovation Office comes in, as the critical liaison between academic or cancer research center investigators and industry. The Innovation Office identifies industry partners whose pharmaceutical library of specific compounds or assay system aligns with research being done at Moffitt.

“We bring the power that we have — the science and the patients — and industry brings their strengths: their technology or their capital to help fund the research,” explains Dr. Shain. From there, the Innovation Office works at defining the parameters of the relationship: timelines, goals, decision points and any intellectual property protections.

The Signal Genetics alliance currently in place is an example of the collaboration between science and industry that holds hope for myeloma patients.

As Dr. Shain explains, “Signal Genetics developed a gene expression profile in multiple myeloma that is prognostic, which in simplest terms, helps categorize patients as either high risk or low risk, meaning how well or poorly they are expected to do. Through our partnership, we hope to either improve on that profile or develop a new one that might be more predictive in terms of drug response or specific parts of therapy. Ultimately, by working together, we hope to develop new patterns and predictive signatures using gene expression profiles.”

The collaboration, which took three years to coordinate and includes both technology and funding from Signal Genetics, encompasses three separate projects.

**PROJECT 1** aims to identify patients who are at high risk to advance from the slow-growing (indolent) disease stage to active disease, and start them on the appropriate treatment before the disease has a chance to progress.

**PROJECT 2** aims to identify a gene expression profile or signature that will predict early relapse post-transplant in patients for whom the disease has reached active stage, as well as seek other and better alternatives to stem cell transplant.

**PROJECT 3** aims to use the outcomes of current therapeutics patients are receiving at Moffitt to identify gene expression signatures that will predict either a response or lack of response to those drugs, leading to personalized therapy for individual patients to improve results.

Signal Genetics is bringing not only its technology to the partnership but also the funding to help support the work Moffitt researchers are doing. “It’s a great example of the collaborative process and what every strategic alliance should be like,” Dr. Shain says. “We are all working together to develop new tools to maximize efficacy and avoid toxicity on a per-patient basis to create a personalized treatment regimen.”

In addition to the Signal Genetics partnership, the Innovation Office has other alliances in the pipeline, including those with TG Therapeutics, Lion Biotechnologies, Celgene, Acetylon Pharmaceuticals and Rosetta Genomics.

For Dr. Shain, his focus on research was influenced in part by his father, William G. Shain, Ph.D., a neuro-biologist at Seattle Children’s Research Institute, whose most recent work involved examining the neural microenvironment in Parkinson’s disease.

While his father deals with the micro-environment of the brain, “you can say I deal with the micro-environment of myeloma,” Dr. Shain explains. He attributes this focus to his time as a research graduate student at the University of South Florida in the late 1990s.



*Dr. Shain divides his time among clinic work, conducting clinic trials and performing research focused on multiple myeloma and other blood disorders.*

There, he worked in the lab of William Dalton, M.D., Ph.D., the former CEO of Moffitt Cancer Center and now CEO of M2Gen®. “With his mentorship and leadership, I learned much about translational research — the ‘bench to bedside’ concept — which I found very enjoyable and exciting,” Dr. Shain says. “So I finished my Ph.D. under his leadership and went back to medical school. Myeloma was the disease he taught, so since 1997, I have known what I wanted to do.”

Since then, Dr. Shain completed his residency in internal medicine followed by a fellowship in hematology/oncology at the University of South Florida. Currently, he is conducting clinical trials with the aim of improving the standard of care for patients with myeloma.

With the latest technological advancements and the increase in industry alliances, researchers can look forward to discovering a variety of new therapeutics and protocols to help develop better ways to identify and treat patients with cancer.

As for Dr. Shain, his goal is both deceptively simple and far-reaching:

*“To personalize our care for patients — using the right drug at the right time in the right way for the right patient.”*