

USING PRECISION MEDICINE TO TREAT CANCER



Located at UW Medicine at South Lake Union, ISCRM brings together researchers from many disciplines for collaboration and discovery.

The Institute for Stem Cell and Regenerative Medicine

Pam Becker, M.D., Ph.D., is a member of the Institute for Stem Cell and Regenerative Medicine (ISCRM). Founded in 2006, ISCRM brings together more than 140 people from various medical disciplines and institutions. Together, they are pursuing the promise of stem cells in repairing or regenerating damaged tissue.

With stem cell medicine, ISCRM scientists see the opportunity to make great strides in treating diseases, injuries and conditions such as heart disease, blindness, cancer, Alzheimer's disease and other conditions that affect millions of people worldwide.

About the Quellos Core

As a service to UW Medicine's scientific community — and to other scientists — ISCRM provides fast, sophisticated testing capability through the Quellos High-throughput Screening Core. Scientists, including Dr. Becker, use the core's equipment to test the efficacy of hundreds of drugs and compounds against disease. We are searching for funding to update this equipment.

EVERYONE'S CANCER IS DIFFERENT; a one-size-fits-all approach to treatment simply won't work. Instead, we need to rethink how we treat cancer through a precision-medicine approach: providing specific treatments tailored to an individual's biology and cancer type. Our challenge is to develop drugs or therapies that can target each person's cancer.

Thus far, approved drugs exist for only about 10 cancer-causing mutations, and these mutations are found in only a small fraction of all cancer cases. For precision medicine to fulfill its potential as a powerful cancer-fighting tool, more data on the genetic mutations that lead to cancer must be gathered. And medications needed to treat each mutation must be developed. This is exactly what Pam Becker, M.D., Ph.D., and her team at UW Medicine are doing with the help of the Institute for Stem Cell and Regenerative Medicine at the University of Washington.

The Power of Clinical Trials

Dr. Becker specializes in treating people with blood disorders, including acute myeloid leukemia (AML), a rapidly progressing and often fatal cancer. In an effort to bring precision medicine into the clinic, where it can benefit patients, Dr. Becker and her group are involved in a number of clinical trials.

The first clinical trial on leukemia: a success. Dr. Becker's team took blood or bone marrow samples from 15 patients. They ran the patients' tumor cells in a high-throughput test — undertaken at ISCRM's Quellos High-throughput Screening Core — against a panel of 160 drugs, some FDA-approved, some under investigation. Finally, they conducted a clinical trial in which the patients were treated using the drug indicated by the screening as being effective against their cancer type. Nearly all of the patients experienced a decrease in the leukemia cell count in their blood.

The second, pending clinical trial on leukemia: an expansion. Dr. Becker's team has developed a second-generation trial for adults and children with refractory acute leukemia (a condition in which the tumor cells have resisted the original treatment). They hope to recruit 15 participants. This trial will take into account patient information on gene mutations, gene expression and *in vitro* testing. Tumor samples will be run against individual drugs and drug combinations from a new panel. This new trial will allow researchers to determine which medication — or combination of them — works best on individual patients.

A third trial: on multiple myeloma. Multiple myeloma forms in plasma cells, a type of infection-fighting white blood cell. The disease allows cancer cells to accumulate in the bone marrow, where the proteins they create may cause kidney problems. For this trial, Dr. Becker’s team is seeking funding to prepare for high-throughput compound testing, a process that includes purifying cells and other steps.

Opportunities for Partnership

We are seeking support for the second and third research trials, detailed above. While the results of both these trials are highly specific to AML and multiple myeloma, developing this model of precision-medicine research is likely to benefit all types of cancer research. As we improve our ability to link more mutations to treatments that work, a larger proportion of the patient population will be able to benefit from precision medicine. **In other words, a single gift can have a great deal of leveraging power.**

Below are the expenses and philanthropic investments associated with Dr. Becker’s work, as well as the cost associated with updating the Quellos Core.

Expenses for the Refractory Acute Leukemia Trial	Investment
Enrolling patients and purchasing the most promising drug combinations.	\$300,000
Underwriting salaries for the clinical staff who will support the research trial.	\$100,000
Conducting genomic analysis needed to determine the best drug or drug combination.	\$100,000
	\$500,000

For the **multiple myeloma trial**, we are searching for funds to underwrite pre-clinical trial expenses.

Expenses for ISCRM’s Shared Resources	Investment
Update equipment for the Quellos High-throughput Screening Core	\$1.5 million

Your Support

Dr. Becker’s research has the potential to revolutionize how we treat leukemia patients and other patients with cancer.

If you would like more information on these research trials, on precision medicine or on the Institute for Stem Cell and Regenerative Medicine, please contact Christine Chan Anderson, associate director for philanthropy, at 206.221.3286 or ccanders@uw.edu, or Jim Boyle, senior director for philanthropy, at boyleje@uw.edu or 206.543.7252.



Key Faculty

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