cancer. She is also a medical oncologist who treats patients with melanoma and different types of sarcoma and is seeking to develop new targeted therapies for these cancers.

Physician-scientist Ping Chi

In a recent interview, Dr. Chi, who joined Memorial Sloan Kettering in August 2011, discussed her path to becoming a physician-scientist, why she joined Memorial Sloan Kettering, and her goals for the research she is pursuing.

What set you on the path to becoming involved in science and medicine?

I went to high school in China, and then I came to the United States to attend Mount Holyoke College, in Massachusetts. One of the summers I was in college, I participated in the Summer Undergraduate Research Fellowship Program at The Rockefeller University, working in the laboratory of Paul Greengard, who is a neuroscientist and a Nobel laureate. This really started my interest in pursuing a career in science.

But I was also interested in medicine, because my father had some medical conditions, and I felt it would be good to have a doctor in the family. Dr. Greengard suggested I do both, and that led me to the Tri-Institutional MD/PhD Program within Rockefeller, Weill Cornell Medical College, and Memorial Sloan Kettering.

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How did you go from an interest in neuroscience to oncology?

When I graduated from the MD/PhD program in 2003, that's when targeted therapies for cancer treatment were really starting to take off. I saw that what researchers were doing at the bench was making a clear impact on clinical practice.

While I was doing my clinical training at Brigham and Women's Hospital, in Boston, there were a lot of pivotal trials under way that were changing how many cancer patients were treated. These new drugs included imatinib [Gleevec®] for chronic myelogenous leukemia and gastrointestinal stromal tumor [GIST, a rare type of gastrointestinal cancer] and gefitinib [Iressa™] for certain types of non-small cell lung cancer. Oncology was a field that was really blossoming. In retrospect, I'm confident I made the right choice.

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What brought you back to New York and to Memorial Sloan Kettering?

I completed my training in New York with a medical oncology fellowship at Memorial Sloan Kettering, with a concurrent postdoctoral research fellowship

in David Allis's lab at Rockefeller.

When my husband and I were trying to decide where to begin our practices and start our labs — while raising our two daughters — we knew we wanted to be somewhere where we could combine research with being in the clinic. [Dr. Chi is married to Yu Chen, another investigator in HOPP.] What we liked about HOPP is that we would have sufficient time to focus on our lab research without having to let go of our clinical duties.

HOPP researchers have different medical specialties — from pathology to radiation oncology to medical oncology to surgery — and treat many different kinds of cancer, but in the laboratory we tend to ask similar types of questions about the molecular causes of cancer. Our research perspective is somewhat different because we're coming from a combined background rather than only a basic science background or a clinical research background.

Although we work primarily in the lab, we are always interacting with other clinicians. So we are not just learning from our own experiences, we're gaining the wisdom of our clinical colleagues as well. Because we meet regularly with our physician colleagues to discuss new cases, we never lose sight of the practical and clinical considerations that go into making decisions about the treatment for each patient.

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How does your clinical practice relate to your research?

I'm a member of the Melanoma and Sarcoma Service in the Department of Medicine, so I see patients with melanoma and many different types of sarcomas. [Sarcomas are a diverse group of tumors that arise in the body's tissues such as muscles, fat, and cartilage.]

In the lab, I'm focused on discovering and understanding molecular changes in cells that lead to the formation or progression of cancer. I am looking both at genetic changes such as mutations, which affect the sequence of DNA, and epigenetic changes, which do not alter the DNA sequence as such but nevertheless affect gene expression. I also study the cellular context in which these genetic and epigenetic changes occur, which is important because sometimes a change will lead to cancer and other times it will just kill the cells or the tissue, depending on the signals that are activated by other nearby cells.

My lab is using many different approaches — including mapping the epigenome, studying the formation of disease in mouse models, and using high-throughput screens, which can evaluate gene expression in thousands of samples at the same time — to look for novel genetic markers we may be able to target with drugs.

Even though we have come very far with targeted therapy, we still have a poor understanding of the biology of many types of sarcoma, and we don't have a lot of treatment options.

A new focus of my lab is studying something called malignant peripheral nerve sheath tumors. The only treatment for them is surgery, and the surgery is very difficult because the tumors can surround crucial nerves. So I'm trying to identify the biological Achilles' heel of these tumors. Understanding both their genetic and epigenetic factors could lead to the design of clinical trials.

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What's next for your research?

I'd like to get more involved with early-stage clinical trials that exploit the same molecular mechanisms I'm studying in the lab. In particular, there is a new treatment strategy for patients with GIST that targets a gene called *ETV1* and potentially could be used as an alternative and a more effective therapy than imatinib, which targets a different gene. My colleagues and I hope to start a trial for this new treatment strategy early next year.

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