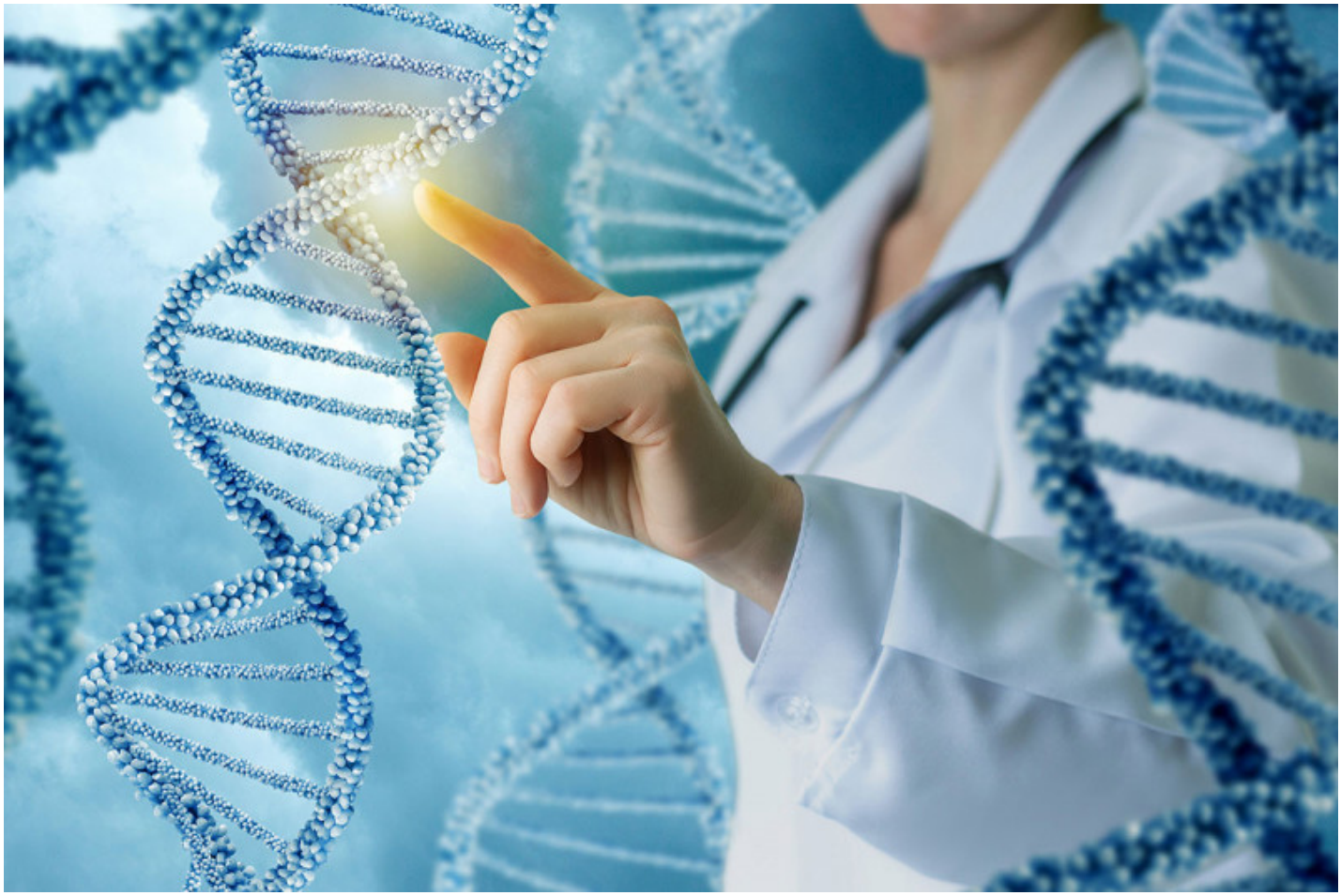
New MSK Initiative Focuses on the Early Detection and Prevention of Cancer

By Julie Grisham, **Thursday, February 22, 2018**



New insights on how genes contribute to cancer are leading to more effective diagnosis and treatment options.

Summary

Cancer is more treatable when it's caught early. This fact is driving MSK's new Precision Interception and Prevention initiative.

Cancer often begins to form years or even decades before symptoms appear. And for most cancers, the longer they remain undetected, the more opportunities they

have to spread, ultimately making them much harder to treat.

That's why early detection is an important focus of cancer research. Memorial Sloan Kettering recently launched the Precision Interception and Prevention (PIP) initiative to advance those developments. This institution-wide, broad-ranging effort will concentrate not only on catching cancer very early but also on preventing it from developing in the first place.

"This concept has always been incredibly appealing, but until very recently, the tools to address it were not there," says MSK Physician-in-Chief José Baselga. "Today, with the capabilities we now have for genomic sequencing of tumors, everything is falling into place. We believe that PIP will change cancer as we know it."

Developing a Tool Kit for Early Cancer Diagnosis

One of the most important tools that has made this effort possible is **MSK-IMPACT™**, a diagnostic test that looks for genetic changes in people's tumors. However, the test goes beyond just analyzing tumors; it also reveals mutations in people's normal cells. Because of that, it's uncovering both the genetic changes that drive existing tumors and the genetic changes that people are born with. Some of these inherited mutations make them more susceptible to developing future cancers.

Rates for any given cancer are low in the general population. That makes it hard to home in on markers for them. But people who have undergone MSK-IMPACT testing for existing cancers and have been found to carry inherited mutations can help in the development of better detection methods.

Family members of those people who have been found to carry cancer genes can also be tested. "Beyond the benefits for our patients, another important goal of our initiative is to identify family members who appear healthy but may harbor inherited mutations in cancer genes," says **Zsofia Stadler**, an MSK medical oncologist and clinic director of the **Clinical Genetics Service**. "These at-risk family members can make more-intensive efforts at cancer screening and risk reduction, with the goal of early detection or even cancer prevention."

Moreover, some of the inherited mutations could affect treatment. Doctors may use this genetic information to select targeted therapies for patients.

A Focus on Blood Cancers

Another major part of PIP is early-detection methods for blood cancers, such as **leukemia** and **myelodysplastic syndrome**. MSK-IMPACT testing has helped detect a condition called clonal hematopoiesis (CH). CH is a genetic signature found in the blood that identifies people who have an increased risk of developing certain blood cancers.

MSK has **opened a CH clinic,** the first of its kind. There, people with CH can be followed to learn more about how these cancers form and, eventually, to develop ways to prevent them.

"Our CH clinic is an important component of PIP, and one of the most novel aspects of the whole initiative," says **Luis Diaz,** Head of MSK's Division of Solid Tumor Oncology, who is spearheading PIP. Dr. Diaz joined MSK in April 2017 but was interested in the importance of developing early-detection and prevention methods even before coming to MSK. "My job is to make it happen," he notes.

MSK Opens New Clinic to Monitor People with a Genetic Risk for Developing Blood Cancer

MSK's new clinic will focus on clonal hematopoiesis, a condition related to aging that increases the risk of developing certain blood cancers.

Learn more

Eliminating Traces of Cancer

PIP will also be looking for better ways to detect and treat the small amounts of cancer that may be left after people have had treatment. This is called minimal residual disease.

Even after someone has had surgery, radiation, and chemotherapy to treat a tumor, some cancer cells may remain. These cells may continue to circulate in the blood or may hide out in the body. Eventually, they can start growing again and form new tumors.

An important tool for both cancer screening and ensuring that all traces of cancer are gone will be liquid biopsies. This approach seeks to detect cancer with a simple blood test. As cancer cells break down in the normal course of cell death, they shed their DNA into the bloodstream. New gene-sequencing technology has made it increasingly possible to detect cancer genes in the blood.

In the case of minimal residual disease, liquid biopsies could be able to tell that there's still cancer in the body so doctors could offer their patients additional treatments. This way, people can make sure that when cancer is gone, it's gone for good.

Focusing on Groups at High Risk

Perhaps the biggest risk factor for cancer, along with aging, is tobacco use. The link between tobacco and cancer has been well established for decades. There are a few methods for detecting tobacco-related cancers early, but none for preventing them.

For several years, MSK has offered **low-dose CT screening** for people at the highest risk of **lung cancer** due to smoking, but this technology can miss some cancers. In addition, CT screening has a high rate of false positives: More than 90% of findings are not cancer. And there are no established screening methods for other tobacco-related cancers, including **head and neck cancers**, **esophageal cancer**, and **bladder cancer**. PIP plans to address those shortcomings.

> “We plan to screen thousands of people to look for tumor markers.”

Luis Alberto Diaz, Jr.
Division of Solid Tumor Oncology Head

“This program will leverage what we can learn from people who are heavy smokers with the ambition of looking for novel markers for detection,” Dr. Diaz says. “We plan to screen thousands of people to look for tumor markers not only in the blood but also in the saliva and urine.”

Eventually, he adds, the program will focus on developing and testing therapies that will actually prevent smoking-related cancers.

“Everyone in the scientific community recognizes and values the merits of these preventive approaches for cancer,” Dr. Baselga concludes. “As we have already shown with the development of MSK-IMPACT, MSK has an amazing operational strength to do whatever we set our minds to doing. Across the institution, our sense of commitment and personal excellence will make us leaders in this area.”

Comments

> Commenting is disabled for this blog post.

Maria J W Adams

Aug 29, 2018 • 4:57 PM
I would like to participate in the PIP clinical trials.

I never smoked, but I heave breast cancer in the family (mother and sister).

I am 66 years old and come from The Netherlands (38 years ago).

Memorial Sloan Kettering

Aug 30, 2018 • 11:15 AM
Dear Maria, we don’t yet have any trials looking at breast cancer risk as part of our PIP initiative, but you may be interested in participating in our RISE program for