

## Accelerating Science – Advancing Medicine

This is a historic time for the Department of Obstetrics, Gynecology and Reproductive Science as we expand our reach throughout New York City and the metropolitan region as a member of the Mount Sinai Health System.

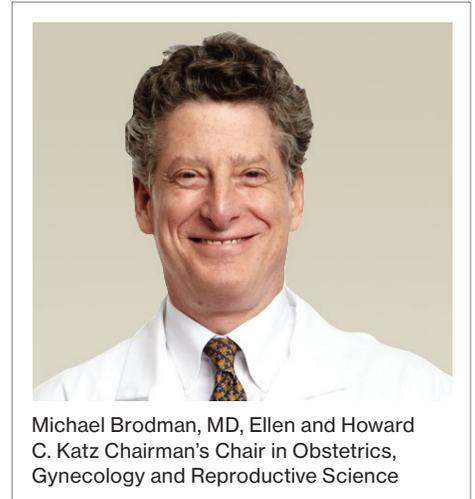
Together, Mount Sinai Beth Israel, Mount Sinai Beth Israel Brooklyn, Mount Sinai Queens, Mount Sinai Roosevelt, Mount Sinai St. Luke's, and The Mount Sinai Hospital offer innovative and collaborative care that elevates our specialty, both locally and globally.

In this *Chair's Report* we highlight advancements being made in our Ovarian Cancer Translational Research Lab that are leading to new diagnostics and therapies, including a test that can assess a tumor's response to treatment.

We also discuss the risk factors in fetal diagnostic procedures, examine how they are

assessed, and explain the latest methods of enhancing the accuracy of prenatal diagnostic testing. Sensitivity to the patient's needs is imperative, especially when it comes to genetic testing. We strongly recommend counseling and follow-up that will enable the patient to make the most informed decision when she is presented with the results.

The highly ranked Icahn School of Medicine at Mount Sinai, which serves as the academic locus for our large Health System, offers numerous fellowships that help develop future leaders in women's gynecological and reproductive health. One of these fellowships focuses on global women's health, teaching



Michael Brodman, MD, Ellen and Howard C. Katz Chairman's Chair in Obstetrics, Gynecology and Reproductive Science

residents how to tackle the complex issues facing women worldwide.

These examples of Mount Sinai's educational, scientific, and clinical initiatives are advancing women's health and developing our legacy as a leader in the field.

## Finding Tumor DNA in a Blood Sample

Physicians and scientists at the Mount Sinai Health System's Division of Gynecologic Oncology have combined state-of-the-art technology with a deep understanding of tumor behavior to create new methodologies that track and destroy resistant tumors and translate this knowledge to a clinical setting.

Their promising findings have led to the development of a new blood test that detects traces of tumor DNA in patients' bloodstreams. Preliminary results show that tumor detection occurred even when other tests that have already been approved by the U.S. Food and Drug Administration were negative. The research team now plans to expand testing to include a larger population of patients.

The genesis for this work stems from a unique biorepository that was created in 2007 by John Martignetti, MD, PhD, Associate Professor at the Icahn School of Medicine at Mount Sinai, and Peter Dottino, MD, Director of Gynecologic Oncology, who wanted to better understand the genetics and genomics of ovarian cancer.



Researchers use a blood sample to look for a single copy of tumor DNA.

The repository contains information from Mount Sinai's gynecologic oncology patients who choose to participate by donating blood and tissue samples over the course of their care. The researchers create cell lines from the patients' tumors and develop mouse "avatar" models that grow the tumors. Each sample is linked to clinical information about the patient, her treatment, and response.

"We are very careful about linking all the biologic samples and patient data in real time," says Dr. Martignetti. "That initial tumor source is not just a static piece of information. It is continuously updated and exponentially more informative."

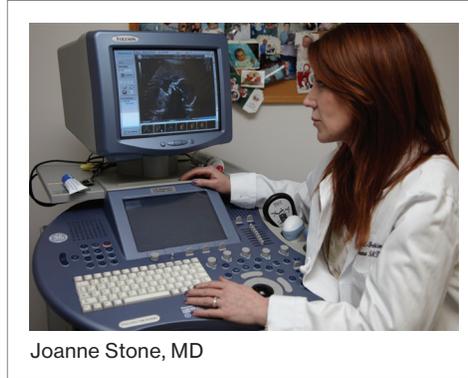
By maintaining high-quality standards, variability in surgical technique and follow-up care for Mount Sinai's ovarian cancer patients is minimized. This consistency, says Dr. Martignetti, means that differences seen among the biorepository's samples likely represent real genetic variation rather than external influences.

## Assessing the Risks of Chorionic Villus Sampling and Amniocentesis

Joanne Stone, MD, Division Director of Maternal-Fetal Medicine, and her colleagues at the Mount Sinai Health System are working to enhance the understanding and safety of chorionic villus sampling (CVS) and amniocentesis, the two preferred methods of prenatal diagnostic testing. The safety of these tests has been shown to be related to operator experience.

With CVS, a small sample of placental tissue (chorionic villi) is obtained either transcervically or transabdominally using ultrasound guidance during the first trimester of pregnancy. Amniocentesis is usually performed for diagnosis of aneuploidy, at or beyond 15 weeks gestation.

Considering the sensitivity of both procedures, Dr. Stone says genetic counseling and follow-up care for each patient are imperative. "In



Joanne Stone, MD

order to make an informed decision about invasive testing, patients need accurate information on risks of fetal loss," she says.

Unfortunately, spontaneous fetal loss rates are difficult to estimate, as large populations have not been followed from early pregnancy. In addition, attempts to estimate background-

loss rates have been biased by different definitions of fetal loss, the variability in length of physician follow-up, and different intervals between ultrasound assessment of viability and fetal demise.

Based on the most recent data for singleton pregnancies, miscarriage rates for both amniocentesis and CVS are the same. They are quoted to be between 1/300 and 1/500, but we estimate that experienced centers have miscarriage rates that are far lower, in the range of about 1/1,000.

While there is less available information about loss rates for multiple gestations, Dr. Stone and her colleagues have examined multiple gestations undergoing fetal reduction. They found patients who had undergone CVS had loss rates equivalent to or less than those who did not undergo CVS.

## Improving Women's Health in Developing Countries

The Icahn School of Medicine at Mount Sinai's Global Women's Health Fellowship prepares third-year residents with the training needed to improve the health of women in developing countries, particularly in rural areas, where access to modern health care is severely restricted.

After fellows complete a preparatory course, they have the opportunity to work abroad at a site of their choosing, with faculty supervision. Mount Sinai's residents have participated in programs in countries that include Guatemala, El Salvador, Honduras, Jamaica, and The United Republic of Tanzania.

Under the leadership of Anmarie Beddoe, MD, Assistant Professor in Obstetrics, Gynecology and Reproductive Science, the program emphasizes reducing maternal morbidity and mortality, implementing family planning, and treating issues surrounding female genital cutting, gender-based violence, and obstetric-related fistulae. In addition, the fellows are taught to initiate screening programs for HIV/AIDS, sexually transmitted diseases, and breast and cervical cancers.

The fellows also participate in the design and execution of their own clinical and/or research projects and apply for Institutional Review Board approval for the studies they initiate. They are trained to focus their services, share knowledge, and develop their research skills by defining direct measures of disease, and factoring in morbidity and mortality, social development, education, and poverty.

According to Dr. Beddoe, the program's "objective is to train future leaders in global women's health and allow them to design research and clinical programs that can be implemented anywhere around the world."

The Department of Obstetrics, Gynecology and Reproductive Science



Mount Sinai residents train birth attendants in Guatemala to perform prenatal exams with basic assessments of maternal health.

also offers fellowships in gynecologic oncology, maternal fetal medicine, minimally invasive pelvic surgery, pelvic medicine and reconstructive surgery, and family planning.

The Icahn School of Medicine at Mount Sinai has a significant impact on graduate medical education, and serves as one of the largest residency training programs in the United States, with 2,000 residents. The medical school is ranked No. 19 nationally, according to *U.S. News & World Report*.

For additional information on Mount Sinai's Department of Obstetrics, Gynecology and Reproductive Science, please visit [www.mountsinaihealth.org/obgyn](http://www.mountsinaihealth.org/obgyn).