

MSKLife: Bringing MSK's Genomics Expertise to Ghana

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As we celebrate [World Cancer Day](#) on February 4, there's reason for optimism when it comes to cancer in Africa: Cancer diagnoses and outcomes in Ghana may improve, thanks to the **Cancer Genome Project Ghana** partnership, a collaboration between Ghanaian medical research institutes and MSK's Genomics, Pathology, and Pediatrics departments.

"Our intent is to bridge the disparities so that access to treatment, more knowledge, and better outcomes will be there for patients in Ghana," says **Tanya Trippett**, a pediatric and hematologic oncologist at MSK and founder of the partnership. "This will be a tremendous legacy for us to offer to the next generation. It is a great privilege for our institution to be involved."

For the first time ever, leading researchers and clinicians in infectious disease, pathology, cancer, and pediatrics from MSK and around the world gathered in Ghana to exchange ideas and technology, and train one another on using diagnostics in cancer research. The event, called the [Cancer Genomic Research and Training Conference: Scaling Up Cancer Research in Ghana](#), was held from October 14 to 18, 2019, in Accra, the capital of Ghana.

The conference was co-led Dr. Trippett and **Ben Gyan**, Associate Professor and Head of the Immunology Department at the [Noguchi Memorial Institute for Medical Research](#) at the University of Ghana.

Cancer Incidence in Ghana

In 2018, according to a [World Health Organization report](#), Ghana had a total population of 29 million people. It also had 22,823 new diagnoses of cancer and approximately 15,000 cancer-related deaths. The highest number of deaths were related to cervical, ovarian, and breast cancers, followed by prostate, liver, colorectal, non-Hodgkin's lymphoma, and stomach cancer.

Despite the growing prevalence of cancer in Ghana, especially cervical and prostate cancer, members of the Cancer Genome Project Ghana say that cancer research and treatment in Ghana lag behind the research and treatment of infectious diseases. There is also a need for more accurate documentation of cancer-related incidence and deaths in the country.

"In Ghana, genomic research is strong in infectious diseases, such as malaria and tuberculosis," says **Michael Roehrl**, Director of MSK's Precision Pathology Biobanking Center, a physician-scientist in the Department of Pathology, and a member of the Cancer Genome Project Ghana



partnership. "But cancer care in Africa overall has been lacking while the incidence of cancer is growing."

"Ghana is no longer considered a developing country, but it will still benefit greatly from partnerships such as the Cancer Genome Project Ghana to co-create more actionable cancer care and research initiatives in the region," says **Nana Yaa Mensah**, a technologist and quality control lead in the Diagnostic Molecular Pathology Service at MSK and a member of the partnership. "This initiative is a collaborative effort to find out what Ghanaian research institutes need and how we can help them reach their goals for cancer care."

Cancer Genome Project Ghana Partnership

Since 2003, Dr. Trippett has created and led many initiatives, including the [Pediatric Oncology Experimental Therapeutics Investigators' Consortium](#), which brings MSK's expertise to developed nations. The summer of 2017 was Dr. Trippett's first introduction to Ghana, when she visited the country to help establish the [International Children's Cancer Research Centre](#).

"The outcomes for childhood cancer are so poor in emerging nations like Ghana," says Dr. Trippett, adding that the average cure rate for children with cancer is only 20 to 30 percent, compared to 85 percent in the United States. "We felt we needed to take a comprehensive approach by building a state-of-the-art cancer center in Africa, integrating cancer genomics from the start and leveraging precision approaches to eliminate cancer in pediatric patients."

After returning to the United States, Dr. Trippett wanted to establish a stronger connection between her newfound partners in Ghana and MSK.

"I wanted to build a community of genomic research specializing in cancer outside of the United States to mirror the capacity that we provide at MSK," she says.

From there, she brought together researchers and experts in cancer genomics from MSK and the Noguchi Memorial Institute for Medical Research, Ghana's leading biomedical research institute, which until recently focused primarily on genomic analyses of such diseases as malaria, HIV, yellow fever, and West Nile virus.

MSK in Ghana

During the conference in October 2019, Dr. Trippett and her MSK colleagues met with international scientists as well as Ghanaian healthcare providers and researchers. Through workshops and hospital visits, MSK staff shared the latest knowledge about noncommunicable diseases (diseases that are not transmitted person-to-person) and introduced innovative oncology tools. They also learned more about the greatest needs and challenges faced by healthcare institutes in Ghana:

- **There are delays in making accurate cancer diagnoses.** Obtaining reagents (substances needed for pathological analyses) or getting diagnostic results can take up to six months or more. This is due to limitations in staff, funding, and resources, as well as the outsourcing of tests. And tests or equipment that are shipped internationally can be held up in customs while authorization is pending. "For patients who do not have insurance, the cost of a surgical procedure is unbundled from the diagnostic pathology, thus placing the burden of pathology costs on the patient," says Dr. Trippett.
- **Specimen acquisition and handling is erratic.** There is a need to establish standard operating procedures for patients' specimen acquisition and handling, as well as optimizing conditions to preserve samples for research.

- **There are shortages of tools, space, and training.** Healthcare centers need better instrumentation, such as microtomes (tools that cut thin slices of material used in microscopy); histology and [immunohistochemistry](#), [flow cytometry](#), and molecular testing; more robust and reliable infrastructures for hospital laboratories, such as disruption-free electricity and water supplies; information technology support; and more hands-on training for physicians specializing in pathology.

"There is a lot of truth to the famous quote from Sir William Osler, a Canadian physician and one of the founding professors of Johns Hopkins Hospital, 'As is your pathology, so is your medicine,'" says Dr. Roehrl. "It makes it hard to provide effective cancer care when so many patients in Ghana don't even have an accurate pathological diagnosis. We will carefully look at the Ghanaian healthcare infrastructure and see where we can help." He and the MSK team will compile a working document and present their findings and recommendations to their Ghanaian partners.

"By 2030, 80 percent of the cancer burden will be in developing countries, and the number of cancer cases in sub-Saharan Africa is increasing at an alarming rate," says **Peter Ntiamoah**, Manager of Surgical Pathology at MSK and a member of the Cancer Genome Project Ghana. "This is the time for us to do something."

Giving Back to One's Home Country

For Dr. Ntiamoah, bringing his expertise to his home country of Ghana holds a special place in his heart. "MSK is a renowned cancer center, so bringing knowledge I've acquired here to the country where I was born is incredibly fulfilling," he says. "Teaming up with institutions in Ghana can help further leverage what MSK has already done to help them get on their feet."

Ms. Mensah echoes Dr. Ntiamoah's sentiments. "As the daughter of Ghanaian immigrants, working at MSK in the Diagnostic Molecular Pathology Service has been a tremendous opportunity to help others, and I am excited to be a part of MSK's wonderful initiative to extend quality cancer care to Ghana and beyond," she says. "Dr. Trippett and the members of the Cancer Genome Project Ghana partnership are creating a lasting and positive impact on the lives of people in the region."

"Dr. Trippett has been a game changer for this," Dr. Roehrl concurs. "I'm delighted and humbled to be part of this project."

To learn more about the Cancer Genome Project Ghana partnership and how to help, email **Dr. Trippett** at trippett1@mskcc.org.