As a faculty member of the Johns Hopkins University School of Medicine, Dr. Zeshaan A. Rasheed, M.D., Ph.D., embraces the mission shared by all Hopkins physicians – teaching, research, and patient care. A specialist in pancreatic cancer who is building an international reputation for his work, Dr. Rasheed leads a research group that seeks answers to the challenges of this disease. His team’s goal for pancreatic cancer is to improve and discover new drugs for the treatment of pancreatic cancer. Following is an update on his research and activities.

Under a Pathway to Leadership grant made possible by the Tempur-Pedic® Retailers – Pancreatic Cancer Action Network – American Association for Cancer Research, Dr. Rasheed is conducting research to better understand the clinical relevance of Cancer Stem Cells in pancreatic cancer. It is becoming clear that not all cancer cells in a tumor are the same. Within the heterogeneous tumor cell population a specific subset of cells, termed cancer stem cells (CSCs), have been shown to fuel tumor growth, drive invasion and metastasis, and contribute to drug resistance. Studies from Rasheed’s lab and others at Hopkins have identified an important role for the Hedgehog protein in pancreatic CSCs, which when unregulated sends incorrect signals that can foster cancer growth. His team is working to develop therapies to perturb Hedgehog and other important pathways in pancreatic CSCs that will selectively kill those tumor cells.

The rationale for this research was drawn by the earlier work of Kimmel Cancer Center physician scientists Richard Jones and William Matsui, who believe that attacking the root driver of tumor progression, the CSCs, in addition to the bulk tumor cell population, will provide the better route to a cure.

Dr. Rasheed has been the primary or co-author of several recent research articles that have appeared in medical and scientific journals such as Molecular Cancer Therapeutics, the Journal of Gastroenterology and Hepatology, and Clinical Cancer Research. He also has been honored with invitations to write peer-reviews and book chapters. His “Pharmacology of Cancer Chemotherapy: Topoisomerase Interactive Agents” appears in the Ninth Edition of the prestigious textbook Cancer: Principles and Practice of Oncology.

Another article authored by Dr. Rasheed, “Mesenchymal features dictate the clinical relevance of cancer stem cells in pancreatic adenocarcinoma” was published in Journal of the National Cancer Institute. This was the first paper to identify aldehyde dehydrogenase (ALDH) as a pancreatic CSC marker, and showed that these cells are associated with worse patient survival. Another article entitled “Biological and clinical relevance of stem cells in pancreatic cancer” appeared earlier this year in the Journal of Gastroenterology and Hepatology. In it, Rasheed and co-author William Matsui explain that CSCs have been identified in a growing number of human malignancies and
that the development of CSC-targeted therapies may be important in changing the clinical outcomes of patients with this disease.

A clinical trial currently underway at the Kimmel Cancer Center is being led by Dr. Ana De-Jesus-Acosta which is based on laboratory research done by Dr. Rasheed and others at Johns Hopkins, including work that was reported in “A direct pancreatic cancer xenograft model as a platform for cancer stem cell therapeutic development”, which appeared in *Molecular Cancer Therapeutics*. The research tested the use of conventional chemotherapy, such as gemcitabine, in combination with a Hedgehog inhibitor, cyclopamine, in laboratory and animal models to quantify the efficacy for CSC therapeutic development. The results showed that the combination therapy was much more effective than either therapy used alone. This and other studies have lead to the development of two clinical trials at Johns Hopkins utilizing other Hedgehog inhibitors in combination with conventional chemotherapy in patients with early and late stage pancreatic cancer.

As a respected researcher in pancreatic cancer, Dr. Rasheed has been invited to present his novel work on pancreatic CSCs at a number of meetings. Last year he traveled to Fukuoka, Japan to present his work on the clinical relevance of pancreatic cancer stem cells. Earlier this summer he presented his work in Nevada in front of an internationally distinguished gathering of pancreatic cancer researchers to discuss his findings on the role of pancreatic CSCs in mediating metastasis formation.

“This is our decade.”

As we apply our discoveries and adapt technologies so that this new understanding about the cellular mechanisms that lead to cancer can be used routinely to make clinical decisions on how to best treat each patient, we will be improving the care of cancer patients everywhere. The benefits of decades of research have truly begun to payoff in the form of new ways to prevent, diagnose, and treat cancer.

The convergence of brilliant scientific minds and dedicated donors has brought us to this point in time where we can begin to alter the course of cancer in ways we could only imagine just a few years ago. Thank you for your part in making history.

About Dr. Zeshaan Rasheed…

Zeshaan A. Rasheed, M.D., Ph.D. is Assistant Professor of Oncology at the Johns Hopkins University School of Medicine. Dr. Rasheed received a B.S. in Biochemistry in 1997 from Rutgers University, and a Ph.D. in Cellular and Molecular Pharmacology from Robert Wood Johnson Medical School in 2002. In 2004 he received his M.D., also from Robert Wood Johnson Medical School. He began his academic medical career through the Research Pathway at the Mount Sinai School of Medicine in New York, where he completed his internship and residency in internal medicine. He then went on to the Johns Hopkins University School of Medicine, where he completed his fellowship in Medical Oncology. He became Assistant Professor of Oncology in 2011.