

NOTABLE CANCER CENTER MEMBER

Mary Hendrix, PhD



For Mary Hendrix, PhD, the road to Chicago began in West Virginia. As a child, she frequently accompanied her grandfather, an MD with a PhD in pathology, as he made house calls. After leaving a patient's home, Hendrix always asked the same questions, "What caused this illness? Why did this happen? My grandfather usually had to answer, 'We just don't know,' and even at that early age I had a burning desire to find out what caused diseases," she says.

That interest led Hendrix, President and Scientific Director for the Children's Memorial Research Center, professor at Northwestern's Robert H. Lurie Comprehensive Cancer Center and the Feinberg School of Medicine, to a graduate program in anatomy at George Washington University. Her next step was to train at Harvard Medical School as a postdoctoral fellow where she met Elizabeth Hay, MD, whom she considers her greatest scientific mentor. It was Hay, says Hendrix, who taught her about all the aspects of science. "I learned so many things from her--how to perform immunohistochemistry and how to make conventional and monoclonal antibodies. But I also learned how to prepare a manuscript and the importance of presenting your data in a professional manner." Hay recently passed away and Hendrix was asked to participate in her memorial service at Harvard, representing the postdoctoral fellows Hay supported over the years. "It was very special," Hendrix says, "To be part of the distinguished group of Dr. Hay's trainees, whom she mentored for life."

The choice to concentrate her research efforts on cancer was not a difficult one for Hendrix. “This disease touches so many lives that it is impossible to find someone whose life has not been affected by cancer in some way. Our recent work has focused on an area that was underexplored and appears to be very promising for therapeutic development,” she says. “Now that we have started generating promising therapeutic leads, we’ll see how far we can take it.”

While studying the plasticity of aggressive tumor cells, the Hendrix lab discovered that the most aggressive breast, melanoma, prostate and ovarian tumor cells all have important characteristics in common; they express genes that are similar to the genes expressed by embryonic stem cells. They observed a stem cell-like phenotype characteristic of aggressive tumor cells that doesn’t occur in the non-aggressive cells.

The fact that non-aggressive cancer cells still maintain a differentiated phenotype means that the cell type of origin can be identified before they become dysplastic. “They may look like epithelial cells or skin cells with respect to melanoma, but if you have very aggressive melanoma, those tumor cells no longer maintain their original skin cell phenotype. They look like many other cell types because of their plastic genotype,” she explains. The study of genes that give a specific signature to aggressive tumor cells and allows them to resemble stem cells led Hendrix’s lab and colleagues to discover the aberrant expression of a potent embryonic morphogen, called Nodal. Nodal is critical for human embryonic stem cells to maintain their undifferentiated phenotype and also underlies the plasticity of aggressive tumor cells. “Our experiments have focused on why that’s the case, and more importantly, how we can reprogram these aggressive tumor cells to look more like normal cell types. That’s the goal,” says Hendrix. “We’re trying, with the help of the Lurie Cancer Center, to develop Nodal as a biomarker for tumor progression in breast cancer and melanoma, and also to use it as a prognostic marker,” she adds.

Hendrix was recently appointed to the NIH Council of Councils as liaison to the National Cancer Institute. She is the US Editor of Pathology Oncology Research, and Member of the Editorial Boards of Developmental

Dynamics, Cancer Biology and Therapy, Journal of Cellular Biochemistry, Proteomics, Cancer Research, and the American Journal of Pathology. She is a Past-President of FASEB (Federation of American Societies for Experimental Biology) consisting of over 80,000 members, making it the largest coalition of biomedical research societies in the United States.

Hendrix recently served on the National Advisory Council for the Human Genome Research Institute, and now serves on the Annenberg Center for Health Sciences the National Cancer Institute Board of Scientific Advisors, the Board of Directors for Research!America and a member of the NIH Council of Councils. Hendrix is also a Past-President of the Association of Anatomy, Cell Biology, and Neurobiology Chairpersons (AACBNC). She has over 200 publications in biomedical research, and is the recipient of a MERIT Award from the National Cancer Institute. She is also the 2004 Australian Society for Medical Research Lecturer and Medal Recipient for research and advocacy, the 2006 recipient of the Henry Grey Award for life-time achievements in the anatomical sciences, and the 2006 recipient of the Distinguished Women in Medicine and Science Lecturer, Northwestern University Feinberg School of Medicine.