

MARY J. C. HENDRIX, Ph.D.

Scientific Director and President of the Children's Memorial Institute for Education and Research (the research arm of the Children's Memorial Hospital and Dept. of Pediatrics at the Northwestern University, Chicago). Former President of FASEB

Training

B.S., Shepherd College, Shepherdstown, WV (Pre-Med/Biology), 1974

Ph.D., George Washington University, Washington, DC (Anatomy), 1977

Fellow, Harvard Medical School, Boston, MA (Anatomy and Cell Biology), 1977-80

Research Interests/Laboratory Efforts

The scientific objectives of the laboratory include identifying genes which contribute to cancer metastasis and other related diseases which exhibit similar biological activities. The major goal is to define important structure/function relationships, which provide the biological basis for new therapeutic strategies. Recent studies, in collaboration with the National Human Genome Research Institute at NIH, have generated molecular classification(s) of specific tumors, and have provided new prognostic markers and novel targets for therapeutic intervention. In addition, these studies have identified certain genes that are dysregulated during cancer progression and are also aberrant during development, resulting in birth defects. Current research activities focus on elucidating how regulatory molecules and phenotype control genes govern cell-to-cell and cell-to-matrix interactions, epithelial/mesenchymal transitions, and motility. Specific projects include signal transduction events initiated by cell adhesion molecules and growth factors; factors regulating interconversion of the tumor cell phenotype; novel three-dimensional analysis of cellular invasion through extracellular matrices; regulation of matrix metalloproteinases by tumor and stromal cell interactions; tumor angiogenesis and vasculogenesis; and role of the microenvironment in maintaining and inducing an aberrant cellular phenotype.

Selected Publications

Cohen MC, Padarathsingh M and **Hendrix MJC** . Meeting Report: Experimental Models of Prostate Cancer Research, *Am J Path*, 156(1):355-358, 2000.

Khalkhali-Ellis Z, Moore TL and **Hendrix MJC** . Viewpoint: Could hormones make a difference in the treatment of juvenile rheumatoid arthritis. *BioDrug* 13(2):77-86, 2000.

Folberg R, **Hendrix MJC** and Maniotis AJ. Vasculogenic mimicry and tumor angiogenesis. *Am J Path* 156(2):361-381, 2000.

Domann FE, Rice JC, **Hendrix MJC** and Futscher BW. Epigenetic silencing of maspin gene expression in human breast cancers, *Int J Cancer* 85:805-810, 2000.

Khalkhali-Ellis Z, Seftor EA, Nieva DRC, Handa RJ, Price RH, Kirschmann DA, Baragi VM, Sharma RV, Bhalla RC, Moore TL and **Hendrix MJC** . Sex hormone regulation of synoviocyte function in vitro: Implications in rheumatoid arthritis. *J Rheumatol* 27:1622-1631, 2000.

Anguelo Z, Seftor REB, Seftor EA, Sood AK and **Hendrix MJC** . Cytoskeleton proteins as markers for an enhanced metastatic potential: New possibilities in cancer management. *Currents* 1:1-3, 2000.

Kirschmann DA, Lininger RA, Gardner LM, Seftor EA, Odero VA, Ainsztein AM, Earnshaw WC, Wallrath LL, and **Hendrix MJC** . Down regulation of HP1Hsa expression is associated with the metastatic phenotype in breast cancer. *Cancer Research* 60:3359-3363, 2000.

Bittner M, Meltzer P, Chen Y, Jiang Y, Seftor E, **Hendrix M**, Radmacher M, Simon R, Yakhini Z, Ben-Dor A, Dougherty E, Wang E, Marincola F, Gooden C, Lueders J, Glatfelter A, Pollock P, Dietrick K, Alberts D,

Sondak V, Hayward N and Trent J. Molecular classification of cutaneous malignant melanoma by gene expression: Shifting from a continuous spectrum to distinct biologic entities. *Nature* 406:536-540, 2000.

Hendrix MJC . De-mystifying the mechanism(s) of maspin. *Nature Medicine* 6:374-376, 2000.

Hendrix MJC , Seftor EA, Kirschmann DA, and Seftor REB. Molecular biology of breast cancer metastasis: Molecular expression of vascular markers by aggressive breast cancer cells. *Breast Cancer Research* 2:417-422, 2000.

McEarchern JA, Kobie JJ, Mack V, Wu RS, Meade-Tollin L, Arteaga CL, Dumont N, Besselsen D, Seftor E, **Hendrix MJC** , Katsanis E and Akporiaye ET. Invasion and metastasis of a mammary tumor involves TGF- α signaling. *Int J Cancer* 91:76-82, 2001.

Zheng W, Seftor EA, Meininger CJ, **Hendrix MJC** and Tomanek RJ. Mechanisms of coronary angiogenesis in response to stretch: Role of VEGF and TGF β ?. *Amer J Physiol* 280:H909-H917, 2001.

Sood AK, Seftor EA, Fletcher MS, Gardner LMG, Heidger PM, Buller RE, Seftor REB and **Hendrix MJC** . Ovarian cancer vasculogenesis: An alternative mechanism for tumor perfusion. *Amer J Pathol* 158(4):1279-1288, 2001.

Sood AK, Holmes R, **Hendrix MJC** and Buller RE. Application of the National Cancer Institute criteria for determination of microsatellite instability in ovarian cancer. *Cancer Res* 61:4371-4374, 2001.

Hess AR, Seftor EA, Gardner LMG, Carles-Kinch K, Schneider GB, Seftor REB, Kinch MS and **Hendrix MJC** . Molecular regulation of tumor cell vasculogenic mimicry by tyrosine phosphorylation: Role of epithelial cell kinase. *Cancer Res* 61:3250-3255, 2001.

Hendrix MJC , Seftor EA, Meltzer PM , Gardner LMG , Hess AR, Kirschmann DA, Schatteman GC and Seftor REB. Expression and functional significance of VE-cadherin in aggressive human melanoma cells: Role in vasculogenic mimicry. *PNAS* 98:8018-8023, 2001.

Seftor REB, Seftor EA, Gardner LMG, Bilban M, Koshikawa N, Meltzer PS, Stetler-Stevenson WG, Quaranta V and **Hendrix MJC** . Cooperative interactions of Laminin γ 2, MMP-2 and MT1-MMP are required for mimicry of embryonic vasculogenesis by aggressive melanoma. *Cancer Res* 61:6322-6327, 2001. (Cover Illustration)

Hendrix MJC and Campbell P. Communicating Science: From the laboratory bench to the breakfast table. *The Anatomical Record (New Anat.)* 265(4):165-167, 2001.

Dokras A, Gardner LMG, Seftor EA and **Hendrix MJC** . Regulation of human cytotrophoblast morphogenesis by hepatocyte growth factor/scatter factor. *Biol Reprod* 65:1278-1288, 2001.

Dokras A, Gardner LMG, Kirschmann DA, Seftor EA and **Hendrix MJC** . The tumor suppressor gene maspin is differentially regulated in cytotrophoblasts during human placental development. *Placenta* 23(4):274-280, 2001.

Hendrix MJC . Commentary: Apoptosis in colorectal tumors: Does it help tumors metastasize? *Cancer Biology & Therapy* 1:64, 2002.

Hendrix MJC , Seftor REB, Seftor EA, Gruman LM, Lee LM, Nickoloff B, Miele L, Sheriff DD and Schatteman GC. Transendothelial function of human metastatic melanoma cells: Role of the microenvironment in cell-fate determination. *Cancer Res* 62:665-668, 2002. (Cover Illustration)

Sharma N, Seftor REB, Seftor EA, Gardner LM, Heidger PM, Cohen MB, Lubaroff DM and **Hendrix MJC** . Prostatic vasculogenic mimicry involves co-operative interactions of distinct phenotypic subpopulations. *The Prostate* 50:189-201, 2002.

Sood AK, Fletcher MS and **Hendrix MJC** . The embryonic properties of aggressive human tumor cells. *J Soc Gyn Invest* 9(1):1-9, 2002.

Seftor EA, Meltzer PS, Kirschmann DA, Pe'er J, Maniotis AJ, Trent JM, Folberg R and **Hendrix MJC** . Molecular determinants of human uveal melanoma invasion and metastasis. *Clin & Exp Metastasis* 19:233-246, 2002.

Korn D, Rich RR, Garrison HH, Golub SH, **Hendrix MJC** , Heinig SJ, Masters BS and Turman RJ. The NIH budget in the "Postdoubting" era. *Science* 296:1401-1402, 2002.

Odero-Marrah VA, ?Khalkhali-Ellis Z, Schneider GB, Seftor EA, Seftor REB, Koland JG and **Hendrix MJC** . Tyrosine phosphorylation of the serpin maspin in normal mammary epithelia and breast cancer cell lines. *Biochem Biophys Res Comm* 295:800-805, 2002.

Kirschmann DA, Seftor EA, Fong SF, Nieva DRC, Sullivan CM, Edwards EM, Sommer P, Csiszar K and **Hendrix MJC** . A molecular role for lysyl oxidase in breast cancer invasion. *Cancer Res* 62:4478-4483, 2002.

Seftor EA, Meltzer PS, Schatteman GC, Gruman LMG, Hess AR, Kirschmann DA, Seftor REB and **Hendrix MJC** . Expression of multiple molecular phenotypes by aggressive melanoma tumor cells: Role in vasculogenic mimicry. *Crit Rev Oncol Hematol* 44:17-27, 2002.

Hendrix MJC , Seftor EA, Meltzer PS, Hess AR, Gruman LM, Nicholoff BJ, Miele L, Sheriff DD, Schatteman GC, Bourdon MA and Seftor REB. The plasticity of aggressive melanoma tumor cells: Recapitulation of an embryonic stem cell program. *Recent Adv Res Updates* 3:192-200, 2002.

Sood AK, Fletcher MS, Gruman LM, Coffin JM, Jabbari S, Khalkhali-Ellis Z, Arbour N, Seftor EA and **Hendrix MJC** . The paradoxical expression of maspin in ovarian carcinoma. *Clin Cancer Res* 8:2924-2932, 2002.

Seftor REB, Seftor EA, Kirschmann DA and **Hendrix MJC** . Targeting the tumor microenvironment with chemically modified tetracyclines: Inhibition of Laminin 5 α 2 chain promigratory fragments and vasculogenic mimicry. *Molecular Cancer Therapeutics* 1:1173-1179, 2002.

Herlyn M, Padarathsingh M, Chin L, **Hendrix M**, Becker D, Nelson M, DeClerk Y, McCarthy J, Mohla S. New approaches to the biology of melanoma: A workshop of the National Institutes of Health Pathology B Study Section. *Am J Path* 161(5): 1949-1957, 2002.

Schneider GB, Kurago Z, Zaharias R, Gruman LM, Schaller MD and **Hendrix MJC** . Elevated focal adhesion kinase expression facilitates oral tumor cell invasion. *Cancer* 95(12): 2508-2515, 2002.

Sood AK, Buller RE, Coffin J, Jabbari S, **Hendrix MJC** and Klingelutz A. p53 null mutations are associated with a telomerase negative phenotype in ovarian carcinoma. *Cancer Biol Therapy* 1(5): 511-517, 2002.

Sood AK, Fletcher MS, Zahn CM, Gruman LM, Coffin JM, Seftor EA, **Hendrix MJC** . The clinical significance of tumor cell-lined vasculature in ovarian carcinoma: Implications for anti-vasculogenic therapy. *Cancer Biol Therapy* 1: 661-664, 2002. (Cover Illustration)

Hendrix MJC . The potential clinical use of exploiting metastasis suppressor genes in regulating prostatic cancer. *Journal of Urology* 169, 2003.

Khalkhali-Ellis Z and **Hendrix MJC** . Nitric oxide regulation of maspin expression in normal mammary epithelial and breast cancer cells. *Am J Path*, 162(5): 1411-1417, 2003.

Walker-Daniels J, Hess AR, **Hendrix MJC** , Kinch MS. Differential regulation of EphA2 in normal and malignant cells. *Am J Path*, 162(4): 1037-1042, 2003.

Sood AK and **Hendrix MJC** . The complexity of tumor vascularity. *Cancer Biology & Therapy*, 2(3), 2003.

Hendrix MJC , Seftor EA, Hess AR and Seftor REB. Molecular plasticity of human melanoma cells. *Oncogene Reviews*, 22:3070-3075, 2003.

Seftor REB, Seftor EA, Hess AR, and **Hendrix MJC** . The role of the vasculogenic phenotype and its associated extracellular matrix in tumor progression: Implications for immune surveillance. *Clin Applied Immunol Reviews*, 3:263-276, 2003.

Hendrix MJC , Seftor EA, Hess AR and Seftor REB. Vasculogenic mimicry and tumour-cell plasticity: Lessons from melanoma. *Nature Reviews Cancer*, 3:411-421, 2003.

Course Participation

050:240 Human Organ Systems, 1996-present
069:288 Cellular and Molecular Biology of Cancer, 1997-present
060:204 Survival Skills for a Research Career, 1999-present
060:208 Experimental Approaches to Human Disease, 2000-present
069:270 Pathogenesis of Major Human Diseases, 2001-present
033:153 Literature, Science and the Arts, 2001-present
Ethics in Science Seminars, 2001-present

Honors

Outstanding Undergraduate Alumnus Award, Shepherd College, 1988
Honorary Doctorate in Science, Shepherd College, 1996
Recipient, Leading Women Scientist Endowment, 1996-present
Recipient, Kate Daum Endowed Chair, 1999-present
Phi Kappa Phi Honor Society, 1998-present
MERIT Award Recipient, National Cancer Institute, 2002
Distinguished Achievement Award, Celebration of Excellence Among Women, 2003

Editorial Service

American Journal of Pathology, Editorial Board, 1996-present
Pathology Oncology Research, US Regional Editor, 1996-present
Cancer Letters, Editorial Board, 1999- present
Clinical Cancer Research, Editorial Board, 2000-2003; Associate Editor, 2003-present
Cancer and Metastasis Reviews, Editorial Advisory Board, 2001-present
Cancer Biology and Therapy, Editorial Board, 2001-present
International Journal of Oncology, Editorial Academy, 2002-present
Lymphatic Research and Biology, Editorial Board, 2002-present
Clinical Proteomics, Editorial Board, 2003-present
Journal of Cellular Biochemistry, Associate Editor, 2003-present
Cancer Research, Associate Editor, 2003-present
American Journal of Pathology, Associate Editor

National/International Committees

NIH/NCI Pathology B Study Section, 1995-99 (Chairperson, 1998-1999)
FASEB Board of Directors, 1997-present;
President-Elect, 1999-2000;
President, 2000-2001;
Past-President, 2001-2002

International Metastasis Research Society Board of Directors, 1998-present
Society for Regenerative Medicine & Stem Cell Biology Board of Directors, 2001-present
Board of Directors of PRIM&R (Public Responsibility in Medicine and Research), 2001-present
President-Elect, AACBNC (Association of Anatomy, Cell Biology, and Neuroscience Chairpersons)
(U.S. and Canada), 2002-2003;
President, 2003-2004

Representative, FASEB Federal Funding Consensus Conference, 2002-2005