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SEARCH BME :

James Babilion, Ph.D.

Associate Professor

Office:	Room 3531 Wolstein Building
Phone:	(216) 368-0840
Fax:	(216) 368-4969
Email:	james.babilion@case.edu
Mail Address:	Room 319 Wickenden Building 10900 Euclid Avenue Cleveland, OH 44106-7207



Selected links:

- [Department of Biomedical Engineering](#)
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Research Summary

Molecular imaging, defined as the *in vivo* characterization of biological processes at the cellular and molecular level, is an attempt to image the molecular make-up of the macrofeatures currently visualized using "classical" diagnostic imaging techniques. Classically, detection of malignant tumor cells in a background of normal or hyperplastic benign tissue is often based on differences in physical properties between tissues, which are frequently minimal, resulting in low contrast resolution

My laboratory concentrates on research related to the development and application of Molecular Imaging technologies. Specifically we are interested in designing novel imaging tools to image individual and multiple molecular markers of disease. We believe that imaging tissues based on the underlying molecular rather than macromolecular differences will result in a substantial increase in the sensitivity and specificity of medical imaging. Some areas of active research include defining "molecular signatures" of disease, developing paradigms to image multiple markers of disease simultaneously, developing methods to image intracellular disease markers in breast cancer, and developing molecular imaging technologies that allow for intraoperative assessment of disease progression.

Recent Publications

- Sato, F., Fukuhara, H., and Babilion, J.P. Effects of Hormone Deprivation and 2-Methoxyestradiol Combination Therapy on Hormone Dependent Prostate Cancer In Vivo. In press Neoplasia, 2005.
- Tsourkas, A., Newton, G., Perez, J., Babilion, J.P., and Weissleder, R. Detection of Peroxidase-Mediated Dityrosine Formation with Enhanced Yellow Fluorescent Protein. Anal Chem. 2005, 77(9):2862-7.
- Savellano, D.H., Bos, E., Blondet, C., Sato, F., Abe, T., Josephson, L., Weissleder, R., Gaudet, J., Sgroi, D., Peters, P.J., and Babilion, J.P. The Transferrin Receptor: A Potential Molecular Imaging Marker for Human Cancer. Neoplasia, 2003 5(6): 495-506.
- Abe, T., Terada, K., Wakimoto, H., Bookstein, R., Babilion, J.P., and Chiocca, E.A. PTEN decreases *in vivo* vascularization of experimental gliomas in spite of pro-angiogenic stimuli. Cancer Research, 2003 May 1; 63(9):2300-5.
- Ichikawa, T., Hogemann, D., Saeki, Y., Tyminski, E., Terada, K., Weissleder, R., Chiocca, E.A., and Babilion, J.P. MR Imaging of Transgene Expression: Correlation to Therapeutic Gene Expression. Neoplasia, 2002, vol 4, No. 6, pp. 523-530.

- Weissleder, R., Moore, A., Ph.D., Mahmood-Bhorade, U., Benveniste, H. Chiocca, E.A., Basilion, J.P. High resolution in vivo imaging of transgene expression. Nature Medicine, 2000, 6:351-355.

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[Department of Biomedical Engineering](#) | 309 Wickenden Building | Cleveland, Ohio 44106 | Dept. Phone: 216.368.4063
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