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Miklos Gratzl, Ph.D.

Associate Professor

Office:	Room 425 Wickenden Building
Phone:	(216)-368-6589 / 6585
Fax:	(216)-368-4969
Email:	mxq13@case.edu
Mail Address:	Room 309 Wickenden Building 10900 Euclid Avenue Cleveland, OH 44106-7207



Selected links:

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Research Summary

Development and biomedical application of chemical sensing schemes is the focus of my laboratory. Diagnostics in 1-20 microliter body fluids and other samples is performed using micro fabricated electrochemical and optical sensors and an electrochemical micro-pH-stat. We also developed an equivalent of rotating electrode for microliter samples, called the rotating sample system. For cellular research, a diffusional microburet has been developed to continuously deliver reagents and drugs into single live cells. Fluorescence microscopy is employed to quantitate intracellular accumulation. Efflux is measured with a carbon fiber based electrochemical microsensor that can detect Adriamycin, a cancer drug, extruded from cells at very low concentrations. Neurochemical studies as well as measurements at epithelial cell layers are also performed with different microscopic sensing schemes.

Recent Publications

- Oruganti P, Gratzl M, Rate limiting hydrodynamic resistance for controlled reagent delivery. *Anal. Chem.*, in press.
- Kao LT, Shetty G, Gratzl M, Electrochemical pH-stat for microliter fluid specimens. *J. ECS*, 2006.
- Tohda K, Gratzl M, Micro-miniature autonomous optical sensor array for monitoring ions and metabolites. *Anal. Sci.* 22 (7) 937-941 (2006)
- Tohda K, Gratzl M, Micro-miniature autonomous optical sensor array for monitoring ions and metabolites. Part 1. Design, fabrication, and data analysis. *Anal. Sci.*, 22, 383-388 (2006) (article featured on cover of journal, and designated as "hot" article).
- Shetty G, Syed N, Tohda K, Gratzl M, Hydrodynamic electrochemistry in 20 mL drops in the rotating sample system. *Anal. Sci.* 21 (10), 1155-1160 (2005) (article featured on cover of journal).
- Nair S, Gratzl M, Deconvolution of concentration recordings at live cell preparations via shape error optimization. *Anal. Chem.*, 77(9), 2875-2881 (2005).

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