Herbert Tobias

Web Bio Information

Biography

Biographical Statement

As an instrumental analytical chemist, Dr. Tobias' research experience includes the development and application of advance analytical techniques to such areas as biomedical analysis for molecular and isotopic compositions of lipids, such as steroids, and the characterization and study of atmospheric and biological aerosols. Currently, Dr. Tobias is developing comprehensive two-dimensional gas chromatography separation techniques coupled to Isotope Ratio Mass Spectrometry for the measurement of the stable isotopic composition of individual components in complex samples as applied to the detection of the use of exogenous anabolic steroids in sport doping. External collaborations include microfabrication of on-line chemical micro-reactors for Cavity Ring-Down Spectroscopy and in-situ imaging of single particles using the SLAC Linear Coherent Light Source, which generates the world's most intense and short wavelength x-rays.

Before his position at Cornell University, Dr. Tobias was part of a dynamic group at Lawrence Livermore National Laboratory that developed Bioaerosol Mass Spectrometry for the detection of single airborne microorganisms and environmental airborne particulates. An R&D 100 award was given for this work in 2005. As a postdoctoral researcher at the University of California at Riverside, Dr. Tobias helped develop and apply thermal desorption particle beam mass spectrometry to the study of the chemical formation of organic aerosols that contribute to air pollution (known as smog) and the characterization of diesel exhaust particulates.

Professional

Current Professional Activities

American Chemical Society

American Society for Mass Spectrometry

Alpha Chi Sigma: Professional Chemistry Society

Research

Current Research Activities

Advanced separations coupled to isotope ratio mass spectrometry for

compound-specific sourcing studies.

Microfabrication of novel micro-reactors.

Coupling of on-line systems to cavity ringdown spectroscopy.

X-ray imaging of individual particles using most powerful free electron laser at the SLAC National Accelerator Laboratory linear coherent light source.

Extension

Education

Education

08/1994-03/1997, Cornell University, NY, Ph.D. (Analytical Chemistry)
07/1992-07/1994, Cornell University, NY, M.S. (Analytical Chemistry)
08/1988-05/1992, College of William & Mary, VA, B.S. (Chemistry)

Courses

Courses Taught

CHEM 0628 / NS 0690

Websites

Administration

Publications

Selected Publications

Kuramoto, D.; Zare, R.; Tobias, H.J.; Brenna, J.T.; Richman, B.; Crosson, E.; Saad, N.; " Online Compound-Specific 13C/12C and D/H Determinations Using Laser Spectroscopy,." 2011, in preparation.

Zhang, Y.; Tobias, H.J.; Sacks, G.L.; Brenna, J.T. “Calibration and Data Processing in Gas Chromatography Isotope Ratio Mass Spectrometry.” Drug Testing and Analysis, 2011, in press.

Zhang, Y.; Tobias, H.J.; Auchus, R.J.; Brenna, J.T. “Comprehensive Two Dimensional Gas Chromatography Fast Quadrupole Mass Spectrometry (GC×GC-qMS) for Urinary Steroid Profiling. Mass Spectral Characteristics with Chemical Ionization.” Drug Testing and Analysis, 2011, 3, 857-867.

Tobias, H.J.; Zhang, Y.; Auchus, R.; Brenna, J.T. "Detection of Synthetic Testosterone Use by Novel Comprehensive Two-Dimensional Gas Chromatography Combustion Isotope Ratio Mass Spectrometry (GC×GCC-IRMS)," Analytical Chemistry, 2011, 83, 7158–7165.

Frank, M.; Gard, E.; J. Tobias, H.J.; Adams, K.L.; Bogan, M.J.; Coffee, K.R.; Farquar, G.R.; Fergenson, D.P; Martin, S.; Pitesky, M.; Riot, V.J.; Srivastava, A.; Steele, P.;

Williams, A.M. “Single-Particle Aerosol Mass Spectrometry (SPAMS) for High-Throughput and Rapid Analysis of Biological Aerosols and Single Cells,” in Rapid Characterization of Microorganisms by Mass Spectrometry, Fenselau, C. (ed), ACS Symposium Series Vol. 1065; American Chemical Society: Washington, DC, 2011, Chapter 10, pp. 161-196. (Peer Reviewed Chapter).

Martin, A.V.; et.al. “Single Particle Imaging with Soft X-Rays at the Linac Coherent Light Source.” Proceedings of SPIE, International Society for Optics and Photonics, 2011, 8078, Advances in X-ray Free-Electron Lasers, 807809, 1-9. doi: 10.1117/12.886754

Tobias, H.J.; Brenna, J.T. “Microfabrication of Micro-Reactors for Isotope Ratio Mass Spectrometry,” Microfluidics and Nanofluidics, 2010, 9, 461-470.

Zhang, Y; Tobias, H.J.; Brenna, J.T. “Uniform Steroid Isotopic Standards for Gas Chromatography Combustion Isotope Ratio Mass Spectrometry,” Steroids, 2009, 74, 369-378.

Tobias, H.J.; Sacks, G.L.; Zhang, Y.; Brenna, J.T. “Comprehensive Two-Dimensional Gas Chromatography Combustion Isotope Ratio Mass Spectrometry,” Analytical Chemistry, 2008, 80, 8613-8621.

Zhang, Y; Tobias, H.J.; Brenna, J.T. “Uniform Isotopic Standards for Gas Chromatography Combustion Isotope Ratio Mass Spectrometry of Steroids,” Recent Advances in Doping Analysis, 2008, 16, 171-180.

Tobias, H.J.; Sacks, G.L.; Zhang, Y.; Brenna, J.T. “Progress Towards Comprehensive 2D Gas Chromatography Combustion Isotope Ratio Mass Spectrometry (GCxGC),” Recent Advances in Doping Analysis, 2008, 16, 153-162.