

## **Curriculum Vitae**

**Timothy L. Vail**

Department of Chemistry and Biochemistry

Northern Arizona University

Flagstaff, AZ 86011 (928)523-8893

### Academic Record:

Rutgers University: B.Sc. Biology 1986

Fairleigh Dickinson University: M.S. Biological Science 1990

Lehigh University: Ph.D. Biological Science 1996

Post-Doctoral Appointment: (Funded by USAMRD): STC Technologies, Inc. 1996-1998

### Professional Experience and Awards:

1990-1996: Research Assistant, Pocono Comparative Lakes Program, Lehigh University

1994-1996: Research Associate, Lehigh University and Comahue Regional Universidad de Bariloche, San Carlos de Bariloche, Argentina

1996: Laboratory Instructor, Cedar Crest College, Allentown, PA

1996: Lecturer, Muhlenberg College, Allentown, PA

1996-1997: Adjunct Faculty, Northampton County College, Bethlehem, PA

1996-2000: Scientist II, Orasure Technologies, Inc. Bethlehem, PA

2001-2002: Lecturer, Department of Chemistry and Biochemistry, Northern Arizona University

2002-Present: Assistant Professor, Department of Chemistry and Biochemistry, Northern Arizona University

2006 – Departmental Nominee, NAU Faculty Advisor Award

### Extramural and Intramural Research Grants:

1.) NAU Intramural Grant Program: “Nanoparticle Assay for In Vitro Diagnostics” (2002; \$8300)

2.) AZ Technology Research Initiative Fund Growing Biotechnology Initiative: “Micropatterned Protein Biosensor Arrays” (2002; \$23,000)

3.) AZ Technology Research Initiative Fund Growing Biotechnology Initiative:

“Immunochromatographic Assay for Ethynyl Estradiol in Municipal Wastewater” (2003; \$12,000)

4.) Environmental Research, Development, and Education for the New Economy (Propper, PI; Vail, co-PI) “Rapid Assays for the Detection of Endocrine Disrupting Compounds in Municipal Wastewater” (2005) \$24,998

5.) AZ Technology Research Initiative Fund Growing Biotechnology Initiative:

Analysis and Effects of Environmental Endocrine Disruptors In Flagstaff Water Resources: A Novel Collaborative Approach (2005-2007; \$239,520)

6.) Arizona Biomedical Research Commission: “ Paramagnetic Nanoparticle Immunoassay for Food Pathogen Detection” ABRC 9017 (2005-2006; \$84,484)

7.) AZ Technology Research Initiative Fund Growing Biotechnology Initiative: Enhancement of Translational Research and Workforce Development at NAU: Acquisition of a Liquid Chromatograph – Mass Spectrometer (2007; \$140,000)

Most Relevant Refereed Publications:

- 1.) Otto Siebeck, Timothy L. Vail, Craig E. Williamson, Russ Vetter, Dag Hesson, Horacio Zagarese, Edward Little, Esteban Balseiro, Beatriz Modenutti, Jennifer Seva, and Alice Shumate, 1994. Impact of UV-B radiation on zooplankton and fish in pelagic freshwater ecosystems. *Arch. Hydrobiol. Beih.* **43**, 101-114.
- 2.) Zagarese, H.E. Williamson, C.E., Vail, T.L., Olsen, O. and Queimalinos, C. 1997. Long-term exposure of *Boeckella gibbosa* (Copepoda, Calanoida) to in situ levels of solar UVB radiation. *Freshwater Biology* **37**(1), 99-106.
- 3.) H.J.M.A.A. Zijlmans, J. Bonnet, J. Burton, K. Kardos, T. Vail, R. S. Niedbala, and H. J. Tanke, 1999. Detection of Cell and Tissue Surface Antigens Using Up-Converting Phosphors: A New Reporter Technology. *Analytical Biochemistry* **267**, 30-36.
- 4.) R. S. Niedbala, T. L. Vail, H. Feindt, S. Li, and J. L. Burton, 2000. Multiphoton up-converting phosphors for use in rapid immunoassays, *Proc. SPIE* **3913**, 1605-1622,.
- 5.) Frans van de Rijke, Henry Zijlmans, Shang Li, Timothy Vail, Anton K. Rapp, R. Sam Niedbala, and Hans J. Tanke, 2001. Up-converting phosphor reporters for nucleic acid microarrays. *Nature Biotechnology* **19**, 273 – 276.
- 6.) R. Sam Niedbala, Hans Feindt, Keith Kardos, Timothy Vail, Jarrett Burton, Barbara Bielska, Shang Li, David Milunic, Peter Bourdelle, and Remo Vallejo, 2001. Detection of Analytes by Immunoassay Using Up-converting Phosphor Technology. *Analytical Biochemistry* **293**, 22 – 30.
- 7.) Timothy L. Vail, Kevin W. Cushing, Jani C. Ingram, and Ingrid St. Omer, 2006. Micropatterned Avidin Arrays on Silicon Substrates via Photolithography, Self-Assembly, and Bio-Conjugation. *Biotechnology and Applied Biochemistry* **43**, 85-91
- 8.) Timothy L. Vail, Shannon Hyslop, and Silke Buschman 2006. Creating Multi-tasking nanoparticles for diagnostic applications, Proc. 14<sup>th</sup> Internat'l. Conference on Composite/Nano-Engineering **14**, 690 – 691.
- 9) Timothy L. Porter, Timothy L. Vail, Michael Eastman, Ray Stewart, Jim Reed, and William Delinger, 2006. Embedded Piezoresistive Microcantilever Sensors: Materials for Sensing Cyanide Gas. Proc. Materials Research Society **915**, 0915- R04- R09.
- 10) Timothy L. Porter, Timothy L. Vail, Michael P. Eastman, Ray Stewart, Jim Reed, Richard Venedam and William Delinger A Solid-State Sensor Platform for the Detection of Hydrogen Cyanide Gas. *Sensors and Actuators*, in press.

Patents Filed:

- 1.) Vail, Timothy L., Propper, Catherine R., and Hatfield, Jerry (ABOR is Assignee), 2005. Lateral Flow Diagnostic Assay Reader with Radial Cassette Status: Pending.
- 2.) Mayer, Loretta P., Dyer, Cheryl A., and Vail, Timothy L. (ABOR is Assignee), 2006. A nanoparticle drug delivery system for the chemical induction of ovarian failure. Status: Pending

Professional Service and Affiliations:

- 1.) Bio-Engineering Platform Committee, AZ Biosciences Roadmap, Flinn Foundation / Batelle Memorial Institute (2004 – Present).
- 2.) Session Chair, Arizona Nevada Academy of Sciences (2005- present)
- 4.) Textbook Reviewer (Organic Chemistry) Benjamin Cummings Publications (2005)
- 5.) Textbook Reviewer: *Chemistry: The Practical Science* Paul Kelter (University of Illinois), Mike Mosher (University of Nebraska, Kearney) and Andrew Scott (UHI Millennium Institute, Scotland, UK). Houghton Mifflin (2005)
- 6.) Manuscript Reviewer, *Acta Biochimica et Biophysica Sinica* (2006).
- 7.) Project Evaluator, NSF sponsored *Write Like A Chemist* Workshop (2006).
- 8.) American Chemical Society (1999 – present)
- 9.) Arizona Nevada Academy of Sciences (2003- present)