

## B. Jill Venton

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### Positions and Employment

Assistant Professor, University of Virginia, Charlottesville, VA July 2005-present  
Department of Chemistry and Neuroscience Graduate Program

Research interests:

- Detection of dopamine, adenosine, and serotonin using electrochemical sensors
- Development of new carbon nanotube-based biosensors
- Rapid-sampling microdialysis with capillary electrophoresis detection for monitoring neurotransmitter changes during behavior

Postdoctoral Researcher, University of Michigan, Ann Arbor, MI 2003-2005  
Advisors: Robert Kennedy (Chemistry) and Terry Robinson (Psychology)  
Research topic: Rapid detection of amino acids changes during fear behavior using capillary electrophoresis

### Education

Ph.D., Chemistry (Analytical), University of North Carolina, Chapel Hill, NC 2003  
Advisor: Mark Wightman  
Dissertation: Electrochemical detection of chemical dynamics in the rat brain

B.S., Chemistry, University of Delaware, Newark, DE 1998  
Honors degree, *summa cum laude*  
Research Advisor: Murray Johnston  
Undergraduate thesis: Secondary structure of oligonucleotides probed by MALDI

### Awards and Fellowships

American Chemical Society PROGRESS/Dreyfus Foundation Lectureship 2008  
Eli Lilly Young Analytical Investigator Award 2007  
National Science Foundation CAREER award for young faculty 2007-2012  
NIH Postdoctoral Fellowship 2003-2005  
Charles N. Reilley Award 2002  
National Science Foundation Graduate Research Fellowship 1998-2001

### Grants and Funding

Eli Lilly Young Investigator Award, Oct. 2007-Oct. 2009, \$100,000

**National Institutes of Health**, Aug. 2007-July 2009, \$275,000  
R21: "An electrochemical adenosine sensor for *in vivo* applications"

**American Heart Association**, July 2007- June 2009, \$132,000  
"Mechanisms of adenosine formation during ischemia"

**National Science Foundation**, Feb. 2007-Jan. 2012, \$550,000  
"CAREER: Carbon nanotube modified microelectrodes for insect neurotransmitter detection"

**Distinguished Young Investigator Award**, Fund for Excellence in Science and Technology, University of Virginia, July 1, 2006-June 30, 2007, \$50,000 (extended to 2008)  
"Monitoring fast neurochemical changes using capillary electrophoresis with electrochemical detection"

### Completed Funding

**Jeffress Memorial Trust**, Jan. 1-Dec.31, 2006, \$25,000  
"Development of an electrochemical adenosine sensor"

### Refereed Publications

Note: published under both Venton and Trafton.

#### From work done at Virginia:

20.) C. B. Jacobs, T.L. Vickrey, and **B.J. Venton**. Measuring chemical events in neurotransmission. In "Encyclopedia of Chemical Biology", Wiley. (invited)

19.) A.M. Strand and **B.J. Venton**. Flame etching enhances the sensitivity of carbon-fiber microelectrodes. *Analytical Chemistry*, in press (available online, DOI: 10.1021/ac8001275)

18.) S. Cechova and **B.J. Venton**. Transient adenosine efflux in the rat caudate-putamen. *Journal of Neurochemistry*, in press (available on-line, DOI: 10.1111/j.1471-4159.2008.05223.x)

17.) B.E. Kumara Swamy and **B.J. Venton**. Carbon nanotube-modified microelectrodes for simultaneous detection of dopamine and serotonin *in vivo*. *Analyst*, **2007**, 132, 876-894.

\* This article was highlighted in *Chemical Technology*, **2007**, 4, T66.

16.) B.E. Kumara Swamy and **B.J. Venton**. Subsecond detection of physiological adenosine concentrations using fast-scan cyclic voltammetry. *Analytical Chemistry*, **2007**, 79, 744-750.

#### Work Previous to Virginia:

15.) **B.J. Venton** and R.M. Wightman. Pharmacologically induced, subsecond dopamine transients in the caudate-putamen of the anesthetized rat. *Synapse*, **2007**, 61, 37-39.

14.) **B.J. Venton**, R.T. Kennedy, T.E. Robinson, S. Maren. Dynamic increases in glutamate and GABA in the basolateral amygdala during acquisition and expression of conditioned fear. *European Journal of Neuroscience*, **2006**, 12, 3391-3398.

- 13.) **B.J. Venton**, P.E.M. Phillips, W.C. Wetsel, D. Gitler, G. Augustine, P. Greengard, R.M. Wightman. Cocaine increases dopamine release by mobilization of a synapsin-dependent reserve pool. *Journal of Neuroscience*, **2006**, 26, 3206-3209.
- 12.) D. Gitler, J. Feng, Y. Takagishi, V.M. Pogorelov, R.M. Rodriguiz; **B.J. Venton**, P.E.M. Phillips, Y. Ren, H.-T. Kao, R.M. Wightman, P. Greengard, P. W.C. Wetsel, G.J. Augustine. Synaptic vesicle trafficking and drug addiction in synapsin triple knockout mice. *Cell Biology of Addiction*, **2006**, 341-359.
- 11.) C.J. Watson, **B.J. Venton**, R.T. Kennedy. *In vivo* measurements of neurotransmitters by microdialysis sampling. *Analytical Chemistry*, **2006**, 78, 1391-1399.
- 10.) **B.J. Venton**, T.E. Robinson, R.T. Kennedy. Transient changes in nucleus accumbens amino acid concentrations correlate with individual responsivity to the predator fox odor 2,5-dihydro-2,4,5-trimethylthiazoline. *Journal of Neurochemistry* **2006**, 96, 236-246.
- 9.) **B.J. Venton**, H. Zhang, P.A. Garris, D. Sulzer, P.E.M. Phillips, R.M. Wightman. Real-time decoding of dopamine neurotransmission in the caudate-putamen during tonic and phasic firing. *Journal of Neurochemistry*, **2003**, 87, 1284-1295.
- 8.) **B.J. Venton** and R.M. Wightman. Psychoanalytical electrochemistry: dopamine and behavior. *Analytical Chemistry*, **2003**, 75, 414A-421A.
- 7.) D.L. Robinson, **B.J. Venton**, M.L. Heien, R.M. Wightman. Detecting subsecond dopamine release with fast-scan cyclic voltammetry in vivo. *Clinical Chemistry*, **2003**, 49, 1763-1773.
- 6.) P.A. Garris, E.A. Budygin, P.E.M. Phillips, **B.J. Venton**, D.L. Robinson, B.P. Bergstrom, G.V. Rebec, R.M. Wightman. A role for presynaptic mechanisms in the actions of nomifensine and haloperidol. *Neuroscience*, **2003**, 118, 819-829.
- 5.) **B.J. Venton**, D.J. Michael, R.M. Wightman. Correlation of local changes in extracellular oxygen and pH that accompany dopaminergic terminal activity in the rat caudate-putamen. *Journal of Neurochemistry*, **2003**, 84, 373-381.
- 4.) K.P. Troyer, M.L. Heien, **B.J. Venton**, R.M. Wightman. Neurochemistry and electroanalytical probes. *Current Opinion in Chemical Biology*, **2002**, 6, 696-703.
- 3.) **B.J. Venton**, K.P. Troyer, R.M. Wightman. Response times of carbon fiber microelectrodes to dynamic changes in catecholamine concentration. *Analytical Chemistry*, **2002**, 74, 539-546.
- 2.) D.L. Robinson, P.E.M. Phillips, E.A. Boudygin, **B.J. Trafton**, P.A. Garris, R.M. Wightman. Sub-second changes in accumbal dopamine during sexual behavior in male rats. *NeuroReport*, **2001**, 12, 2549-2552.
- 1.) B.D. Bath, D.J. Michael, **B.J. Trafton**, J.D. Joseph, P.L. Runnels, R.M. Wightman. Subsecond adsorption of dopamine at carbon-fiber microelectrodes. *Analytical Chemistry*, **2000**, 72, 5994-6002.

## **Book Chapters**

C. B. Jacobs, T.L. Vickrey, and **B.J. Venton**. Measuring chemical events in neurotransmission. In "Encyclopedia of Chemical Biology", Wiley. (invited)

M.G. Roper, C. Guillo, and **B.J. Venton**. High speed electrophoretic separations. In "CRC Press Handbook of Capillary Electrophoresis and Microchip Separations" editor: J.P. Landers, *in press*.

### **Invited Lectures**

Eli Lilly & Company. April 15, 2008

"Electrochemical sensors for detection of rapid neurotransmitter changes in the fruit fly"

Pittsburgh Conference on Analytical Chemistry, March 3, 2008

"Carbon nanotube electrodes for *in vitro* and *in vivo* monitoring of serotonin release"

Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Oct. 15, 2007

"Increasing the sensitivity of carbon-fiber microelectrodes for *in vivo* applications"

Southeast Regional Meeting of the American Chemical Society, Oct. 26, 2007

"Real-time measurements of adenosine *in vivo* using carbon-fiber microelectrodes"

University of Virginia, Molecular Physiology and Biophysics Seminar Series, Oct. 8, 2007.

"Real-time detection of neurotransmitter changes: Applications for dopamine, serotonin, and adenosine measurements"

University of North Carolina, Wightman Symposium, July 21, 2007.

"Increasing the sensitivity of carbon fiber microelectrodes for *in vivo* applications"

University of Virginia, Dept. of Anesthesiology Seminar Series, May 8, 2007

"Microelectrodes for studying rapid neurochemical changes: Applications for adenosine, dopamine and serotonin measurements."

University of Virginia, Neuroscience Seminar Series, April 3, 2007

"Sensing and sampling techniques for measuring dynamic changes of neurotransmitters *in vivo*"

Pittsburgh Conference on Analytical Chemistry, Feb 28, 2007

"Carbon nanotube modified microelectrodes for rapid determination of neurochemical changes",

Wake Forest University, Dept. of Chemistry, Feb. 8, 2006

"High speed separations for detection of fast neurochemical changes during behavior."

### **Accepted Invitations for Upcoming Lectures**

Purines 2008, June 2008, Copenhagen Denmark

Monitoring molecules *in vivo*, Aug. 2008, Vancouver, Canada

## **Professional Memberships**

American Chemical Society  
Society for Neuroscience

## **Selected Contributed Conference Abstracts**

M.L. Huffman and **B.J. Venton**. Comparison of Different Carbon Fiber Kinetics by Fast-Scan Cyclic Voltammetry, *Pittsburgh Conference on Analytical Chemistry*, **2008**.

S. Cechova and **B.J. Venton**. Detection of adenosine concentration changes with carbon microelectrodes using fast-scan cyclic voltammetry in striatum of anesthetized rats, *Society for Neuroscience Meeting*, **2007**.

X. Borue, S.E. Cooper, B. Condron, **B.J. Venton**. Rapid detection of extracellular dopamine levels in the fruit fly, *Society for Neuroscience Meeting*, **2007**.

B.M. Kile, **B.J. Venton**, George Augustine, R. Mark Wightman. Evaluation of calcium dependent dopamine release in synapsin triple knockout mice. *Society for Neuroscience Meeting*, **2007**.

B.E. Kumara Swamy and **B.J. Venton**. Rapid monitoring of adenosine concentrations with fast-scan cyclic voltammetry, *Pittsburgh Conference on Analytical Chemistry*, **2007**.

**B.J. Venton** and B.E. Kumara Swamy. Development of a carbon-fiber microelectrode sensor for sub-second detection of adenosine concentrations. *Society for Neuroscience Meeting*, **2006**.

**B.J. Venton**, T.E. Robinson, R.T. Kennedy, S.E. Maren. Transient changes in glutamate and GABA release during acquisition and expression of conditioned fear. *Society for Neuroscience Meeting*, **2005**.

**B.J. Venton**, T.E. Robinson, R.T. Kennedy. Fast changes in amino acid neurotransmitters are correlated with stress behaviors: A microdialysis with online capillary electrophoresis study. *Pittsburgh Conference on Analytical Chemistry*, **2005**.

**B.J. Venton**, T.E. Robinson, R.T. Kennedy. Monitoring fast changes in amine neurotransmitters using microdialysis with on-line capillary electrophoresis detection. *American Chemical Society National Meeting*, Aug. **2004** (invited).

**B.J. Venton**, C.J. Watson, A.-N. Samaha, T.E. Robinson, R.T. Kennedy. Monitoring amine neurotransmitters in freely-moving rats using microdialysis with on-line capillary electrophoresis detection. *American Chemical Society Central Regional Meeting*, **2004** (invited).

**B.J. Venton**, P.E.M. Phillips, D. Gitler, W.C. Wetsel, G.J. Augustine, R.M. Wightman. Cocaine enhances dopamine release through mobilization of a synapsin-sensitive pool. *Society for Neuroscience Meeting*, **2003**.

**B.J. Venton**, R.M. Wightman. Correlation of extracellular oxygen and pH changes in the rat caudate-putamen. *Society for Neuroscience Meeting*, **2002**.

**B.J. Venton**, R.M. Wightman. Dopamine diffusion in the brain measured by amperometry. *Pittsburgh Conference on Analytical Chemistry*, **2002**.

**B.J. Trafton**, E.A. Boudygin, P.E.M. Phillips, D.L. Robinson. The pharmacodynamics of cocaine and GBR 12909: effect on evoked dopamine release measured by fast scan cyclic voltammetry *in vivo*. *Society for Neuroscience Meeting*, **2000**.