

Anne M. Brown, Ph.D.

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EDUCATION AND APPOINTMENTS

- June 2016 – Present** Lecturer
Data and Informatics Consultant, Sciences
University Libraries
Virginia Polytechnic Institute and State University
- August 2011 – May 2016** **Ph.D., Biochemistry**
Virginia Polytechnic Institute and State University
Graduate Certificate in Preparing the Future Professoriate
Graduate Certificate in Gerontology
Graduate Certificate in Research in Translational Medicine
- August 2006 – May 2010** **B.S. Biochemistry, Physics (Cum Laude)**
Roanoke College

AWARDS AND HONORS

- 2016** NACTA Graduate Student Teaching Award of Merit Certificate
2015 Virginia Tech Illuminator Award
2015 Associate, Academy of Graduate Teaching Assistant Excellence
2015 Outstanding Graduate Student Service Excellence Award
2015 Kamal M. Abdo Memorial Endowment Travel Award
2015 Kendall W. King Memorial Scholarship, outstanding senior graduate student in Biochemistry
- 2014** S.J. Ritchey Award, for research focuses in the area of aging
2014 Citizen Scholar Award
2013-2016 Virginia Tech CALS Graduate Teaching Scholar Fellowship
2013 Best Score Poster Presentation, VT 29th Annual Graduate Student Research Symposium
2012 1st Place poster, 2nd Annual Virginia Tech Symposium on Vector-Borne Disease Research
2010 James Lewis Howe Award, outstanding senior in Biochemistry awarded by the Blue Ridge Section of the American Chemical Society
2008 Roanoke College Summer Scholar
2006-2010 Dean's List

TEACHING EXPERIENCE

- Spring 2014 – Spring 2016** **Instructor of Record** – BCHM 5024 Computational Biochemistry for Bioinformatics
Department of Biochemistry, Virginia Polytechnic Institute and State University
Co-instructor with Dr. David Bevan
- Developed and graded assignments and exams, met with students to aide in students in understanding the software for assignments, gave lectures, and guided final project development.
- Summer 2014** **Instructor of Record** – ALS 2984 Chemical Problem Skills for the Life Sciences
Department of Biochemistry, Virginia Polytechnic Institute and State University
- Developed and presented all lectures, assignments, and exams related to the course.
 - Topics include: significant figures, stoichiometry, concentrations, molarity applications, ionic equations and precipitates, acid-base fundamentals
- Fall 2011 – Spring 2013** **Teaching Assistant** – BCHM 4984 Special Studies: Biomolecular Visualization
Department of Biochemistry, Virginia Polytechnic Institute and State University
- Assisted students in the development of projects and introduced them to molecular visualization techniques. Graded projects and helped students develop presentation and writing skills.
- Spring 2012** **Teaching Assistant – BCHM 2024 Concepts of Biochemistry**
Department of Biochemistry, Virginia Polytechnic Institute and State University
- Administered quizzes and exams, held weekly office hours, and met with students upon request
- Fall 2011** **Teaching Assistant – BCHM 5124 Biochemistry for the Life Sciences**
Department of Biochemistry, Virginia Polytechnic Institute and State University
- Administered quizzes and exams, held weekly office hours, and met with students upon request

RESEARCH SUPPORT

Brown, A.M., Turner, S., Yang, S., Eastman, K. *Implementation and assessment of one-on-one companion visiting kits for residents who have dementia in a continuing care facility.* Virginia Tech Engage - John E. Dooley Student Engagement Grant, \$750.00, April 2014-April 2015.

Brown, A.M., Turner, S., Yang, S., Eastman, K. *Implementation and assessment of one-on-one companion visiting kits for residents who have dementia in a continuing care facility.* Virginia Tech College of Liberal Arts and Human Studies, \$500.00, March 2014-May 2014.

RESEARCH EXPERIENCE

2012-2016

Graduate Research Assistant

Focus: Utilization of Computational Techniques to Understand Protein Structure-Function Relationships

Department of Biochemistry, Virginia Polytechnic Institute and State University

Major Professor: David R. Bevan, Ph.D.

- MD simulations of peptide-membrane interactions (amyloid β , IAPP)
- MD simulations of small molecule-DNA complexes, peptide-small molecule
- Molecular docking and virtual screening for novel therapeutic compounds
- Expertise in GROMACS, VMD, PyMOL, AutoDock, MOE
- Expertise in Perl, Linux/Unix, shell scripting, HTML
- Lab manager and undergraduate student researcher mentor

2011-2012

Graduate Rotation Student

Department of Biochemistry, Virginia Polytechnic Institute and State University

Research Mentors: Zachary B. Mackey, Ph.D. and Robert H. White, Ph.D.

- Protein expression, purification, characterization, and microscopy

2007-2010

Undergraduate Researcher

Department of Chemistry, Roanoke College

Research Mentor: Catherine A. Sarisky, Ph.D.

- Protein expression, purification, characterization, NMR, and HPLC

2007-2010

Undergraduate Clinical Researcher

Carilion Clinic

Carilion Center for Healthy Aging

Research Mentor: Dr. David B. Trinkle, M.D.

- One-on-one patient contact, data input/analysis, development of research protocols, and case study reviews
- Projects: Use of Video Gaming Devices to Assess Mild to Moderate Memory Loss in Older Adults, Validation of Noninvasive Body Sensor Network Technology in the Detection of Agitation in Dementia

PUBLICATIONS

*INDICATES UNDERGRADUATE RESEARCH MENTEE

1. Congdon, M.D., Kharel, Y., **Brown, A.M.**, Lewis, S.N., Thorpe, S.B., Bevan, D.R., Lynch, K.R., and Santos, W. L. "Probing the conformation of the sphingosine kinase 2 binding pocket: structure-activity relationship studies and molecular modeling of indole-based sphingosine kinase 2 inhibitors" In preparation.
2. *Hart, M., *Yang, S.H., **Brown, A.M.**, Lemkul, JA, and Bevan, D.R. "Structural and Mechanistic Insights into the Inhibition of Amyloid- β_{16-22} Aggregation by Flavonoids from Molecular Dynamics Simulations". In preparation.
3. *Miller, J.E., **Brown, A.M.**, Lewis, S.N., Hontechillas-Magarzo, R., Bassaganya-Riera, J., and Bevan, D.R. "Development of a docking protocol to achieve agonist specificity among PPAR isoforms" In preparation.
4. **Brown, A.M.**, and Bevan, D.R. "Insight into Amyloid β -Peptide (1-42) Tetramer Formation, Rearrangement, and Tetramer-Membrane Interactions by Molecular Dynamics Simulations". Submitted.
5. **Brown, A.M.**, and Bevan, D.R. "Influence of Sequence and Lipid Type on Membrane Perturbation by Human and Rat Amyloid β -Peptide (1-42)". Submitted.
6. **Brown, A.M.**, Lewis, S.N., and Bevan, D.R. (2016) "Development of a Structure Undergraduate Research Experience: Framework and Implications". *Biochem. Mol. Biol. Educ.* doi:10.1002/bmb.20975
7. Miller, D.V., **Brown, A.M.**, Xu, H., Bevan, D.R., and White, R.H. (2016) "Purine salvage in *Methanocaldococcus jannaschii*: Elucidating the role of a conserved cysteine in adenine deaminase. *Proteins*, **84**(6), 828-840.
8. Congdon, M.D., Kharel, Y., **Brown, A.M.**, Lewis, S.N., Thorpe, S.B., Bevan, D.R., Lynch, K.R., and Santos, W. L. (2016) "Structure-activity relationship studies and molecular modeling of naphthalene-based sphingosine kinase 2 inhibitors" *J. Med. Chem. Letters*. **7**(3), 229-234. (Cover Art for March 2016)
9. **Brown, A. M.**, Lemkul, J. A., Schaum, N., and Bevan, D. R. (2014) "Simulations of monomeric amyloid β -peptide (1–40) with varying solution conditions and oxidation state of Met35: Implications for aggregation." *Arch. Biochem. Biophys.* **545**, 44-52.
10. *Gerben, S. R., Lemkul, J. A., **Brown, A. M.**, and Bevan, D. R. (2013) "Comparing atomistic molecular mechanics force fields for a difficult target: a case study on the Alzheimer's amyloid β -peptide." *J. Biomol. Struct. Dyn.* **32**(11), 1-16.
11. **Brown, A.M.**, Hoopes, S.L., White, R.H., and Sarisky, C.A. (2011) "Purine Biosynthesis in Archaea: Variations on a Theme." *Biol Direct*. **14**(6), 63.

INVITED LECTURES AND WORKSHOPS

1. **Brown, A.M.** "Introducing 3-D Visualization Software in Science Classes: Making Connections and Building Skills in Core Concepts". *Biotechnology Educators Conference*. Blacksburg, VA, July 2016.
2. **Brown, A.M.** "Introducing 3-D Visualization Software and Using it for Understanding Concepts in Coursework". *Virginia Tech Biocomplexity Institute High-Performance Computing in the Medical Sciences*. Blacksburg, VA, July 2016.
3. **Brown, A.M.**, Lewis, S.N., and Bevan, D.R. "Utilization of Molecular Visualization Programs in the Classroom." *Biotechnology Educators Conference*. Blacksburg, VA, July 2015.

PRESENTATIONS AND PUBLISHED ABSTRACTS

* INDICATES UNDERGRADUATE RESEARCH MENTEE

1. **Brown, A.M.** and Bevan, D.R. "Atomistic Molecular Dynamics Simulations of Amyloid β -peptide (1-42): Tetramer Formation, Rearrangement, and Membrane Interactions." *VirginiaBrainRX: A Symposium on Drug Discovery for the Brain*. Richmond, VA, May 2016.
2. **Brown, A.M.** and Bevan, D.R. "Utilization of Computational Techniques to Understand Protein Structure-Function Relationships and Guide Drug Design." *VirginiaBrainRX: A Symposium on Drug Discovery for the Brain*. Richmond, VA, May 2016.
3. *Hollingsworth, L. R. IV, *Fuchs, R.L., Werle, C.M., **Brown, A.M.**, Bevan, D.R., and Gandour, R.D. "Computational Insights into the Optimization of Anti-HIV Alternating Copolymers." *Virginia Tech Advanced Research Computing High Performance Computing Day*, Blacksburg, VA, April 2016.
4. *Hollingsworth, L. R. IV, *Fuchs, R.L., Werle, C.M., **Brown, A.M.**, Bevan, D.R., and Gandour, R.D. "Computational Insights into the Optimization of Anti-HIV Alternating Copolymers." *National Conference on Undergraduate Research*. Asheville, NC, April 2016.
5. *Richardson, M.R., **Brown, A.M.**, and Bevan, D.R. "Assessing the Influence of Flavonoids in Attenuating β -strand Fibril Formation of Islet Amyloid Polypeptide by Molecular Dynamics Simulations." *National Conference on Undergraduate Research*. Asheville, NC, April 2016.
6. *Seeley, K., **Brown, A.M.**, Lewis, S.N., and Bevan, D.R. "The Effect of PPAR γ Mutation Q286P on 15-deoxy-12,14-prostaglandin J2 Binding Activity." *National Conference on Undergraduate Research*. Asheville, NC, April 2016.
7. *Hollingsworth, L. R. IV, *Fuchs, R.L., Werle, C.M., **Brown, A.M.**, Bevan, D.R., and Gandour, R.D. "Computational Insights into the Optimization of Anti-HIV Alternating Copolymers." *Abstracts of Papers, AIChE Mid Atlantic Regional Student Conference*, Newark, DE, April 2016.
8. *Hollingsworth, L. R. IV, *Fuchs, R.L., Werle, C.M., **Brown, A.M.**, Bevan, D.R., and Gandour, R.D. "Computational insights into the optimization of anti-HIV alternating copolymers." *Abstracts of Papers, 251st ACS National Meeting & Exposition*, San Diego, CA, March 2016.
9. *Bittner, M.C., Brown, A.M, and Bevan, D.R. "Understanding Different Factors Affecting Type 2 Diabetes Caused by Variations in IAPP Sequence". *2016 Undergraduate Research and Creative Scholarship Conference*. Blacksburg, VA, February 2016.
10. *Dimitry, N.E., **Brown, A.M.**, and Bevan, D.R. "Using Molecular Dynamics Simulations to Assess Inhibitor Specificity between Sphingosine Kinase 1 and 2." *2016 Undergraduate Research and Creative Scholarship Conference*. Blacksburg, VA, February 2016.
11. *Northington, D., **Brown, A.M.**, and Bevan, D.R. "Insights into Amyloidogenicity: Molecular Dynamics Simulations of AB(17-42)(p3) in Varying Environments." *Summer Undergraduate*

- Research Symposium*. Blacksburg, VA, July 2015.
12. *Mushagasha, J., **Brown, A.M.**, Hilu, K., and Bevan, D.R. "Assessing Structural Differences and the Potential Link to Allergenicity of Antigenic Peanut Protein Orthologs from the Genus *Arachis*." *Summer Undergraduate Research Symposium*. Blacksburg, VA, July 2015.
 13. *Miller, J., **Brown, A.M.**, Lewis, S.N., and Bevan, D.R. "Molecular Docking of PPAR α to Identify Potent Therapeutic Agents for Cardiovascular Disease." *13th Annual VT Undergraduate Research Conference*. Blacksburg, VA, April 2015. (Poster Presentation).
 14. **Brown, A.M.** and D.R. Bevan. "Influence of Sequence and Lipid Type on Membrane Perturbation by Human and Rat Amyloid β -Peptide (1-42)." *249th Annual ACS National Meeting*. Denver, CO, March 2015. (Poster presentation)
 15. **Brown, A.M.** and D.R. Bevan. "Influence of Sequence and Lipid Type on Membrane Perturbation by Human and Rat Amyloid β -Peptide (1-42)." *59th Annual Biophysical Society Meeting*. Baltimore, MD, February 2015. (Poster presentation)
 16. **Brown, A.M.**, Lewis, S.N., and Bevan, D.R. "Development of a Structure Undergraduate Research Experience: Framework and Implications". *7th Annual Conference on Higher Education Pedagogy*. Blacksburg, VA, February 2015. (Oral presentation)
 17. **Brown, A.M.**, Lemkul, J.A., Schaum, N., and Bevan, D.R. "Solution Conditions and Oxidation State of Methionine-35 Affect the Aggregation Properties of Amyloid β -Peptide (1-40)." *Molecular Biophysics Symposium*. Blacksburg, VA, November 2014. (Poster presentation)
 18. Miller, D.V., **Brown, A.M.**, Xu, H., Bevan, D.R., and White, R.H. "Elucidating the Role of a Conserved Cysteine in Adenine Deaminases". *Molecular Biophysics Symposium*. Blacksburg, VA, November 2014. (Poster presentation)
 19. *Berk, S.J., **Brown, A.M.**, Zhao, X., Armstrong, G., Capelluto, D.G.S., and Bevan, D.R. "Membrane Binding Properties of the Innate Immunity Adaptor TIRAP". *Molecular Biophysics Symposium*. Blacksburg, VA, November 2014. (Poster presentation)
 20. *Izac, J.R., **Brown, A.M.**, Xu, B., and Bevan, D.R. "Homology Modeling and Ligand Interactions of GPCRs." *12th Annual VT Undergraduate Research Conference*. Blacksburg, VA, April 2014. (Poster presentation)
 21. *Kellinger, C.P., **Brown, A.M.**, Long, T.E., and Bevan, D.R. "Molecular Dynamics of Non-Viral Gene Delivery Vectors." *12th Annual VT Undergraduate Research Conference*. Blacksburg, VA, April 2014. (Poster presentation)
 22. *Yang, S.H., Hart, M.R., **Brown, A.M.**, Lemkul, J.A., and Bevan, D.R. "Determining the Efficacy of Wine-Related Flavonoids in the Inhibition of Amyloid β -peptide Aggregates." *12th Annual VT Undergraduate Research Conference*. Blacksburg, VA, April 2014. (Poster presentation)
 23. *Ruohoiemi, D., **Brown, A.M.**, Long, T.E., and Bevan, D.R. "Relative Stability of DNA Complexes with Phosphonium/Ammonium-Based Cationic Vectors." *Summer Undergraduate Research Symposium*. Blacksburg, VA, July 2013. (Oral presentation)
 24. *Quasie-Woode, D., **Brown A.M.**, and Bevan, D.R. "Molecular Dynamics Simulation of Interactions Between Amyloid β -peptide and Kisspeptin." *Summer Undergraduate Research Symposium*. Blacksburg, VA, July 2013. (Poster presentation)
 25. **Brown, A.M.**, Lemkul, J.A., Schaum, N., and Bevan D.R. "Solution Conditions and Oxidation State of Methionine-35 Affect the Aggregation Properties of Amyloid β -Peptide (1-40)." *92nd Annual Meeting of the Virginia Academy of Science*. Blacksburg, VA, May 2013.
 26. *Maddox, D.R., **Brown, A.M.**, Xu, B., and Bevan, D.R. "Computational Characterizing the Structural Dynamics and Interactions of Irisin". *92nd Annual Meeting of the Virginia Academy of Science*. Blacksburg, VA, May 2013. (Poster presentation)
 27. **Brown, A.M.**, Lemkul, J.A., Schaum, N., and Bevan D.R. "Solution Conditions and Oxidation State of Methionine-35 Affect the Aggregation Properties of Amyloid β -Peptide (1-40)." *VT 29th Annual Graduate Student Research Symposium*. Blacksburg, VA, March 2013. (**1st place poster**,

- poster presentation)
28. Miller, D., **Brown, A.M.**, and White, R.H. "Establishing New Functions for Conserved Cysteine Motifs in Methanogenic Archaea." *Gordon Research Conference "Thiol-Based Redox Regulation and Signaling"*. Lewiston, ME, August 2012. (Poster presentation)
 29. Valenciano, A., **Brown, A.M.** and Mackey, Z.B. "Determining the Functional Relationship between TbERK8 and TbPCNA in *Trypanosoma brucei*." *Gordon Research Conference "Biology of Host-Parasite Interactions"*, Newport, RI, June 2012. (Poster presentation)
 30. **Brown, A.M.** and Mackey, Z.B. "Determining the Functional Relationship between TbERK8 and TbPCNA in *Trypanosoma brucei*." *2nd Annual Virginia Tech Symposium on Vector-Borne Disease Research*, Blacksburg, VA, March 2012. (**1st Place in Parasitology poster category**, poster presentation)

SERVICE – SYNERGISTIC ACTIVITIES

2016 – present	Faculty Affiliate, Virginia Tech Center for Gerontology
2012 – 2016	Director, Graduate-Undergraduate Mentorship Program
2014, 2015	Mentor, Virginia Tech CALS – Uniondale High School Summer Research Program
2014	Session Chair, Molecular Biophysics Symposium, Virginia Tech
2014	Guest Lecturer – Biochemistry First Year Experience, Intro to System Biology

SERVICE – UNIVERSITY COMMITTEES

2014-2015	Biochemistry Department Head Search Committee
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PROFESSIONAL MEMBERSHIPS

2014 – Present	Biophysical Society
2014 – Present	American Chemical Society
2013 – 2014	Virginia Academy of Science
2010 – Present	Phi Beta Kappa National Arts and Sciences Honor Fraternity
2010 – 2013	Alpha Epsilon Delta Health Pre-professional Honor Society

STUDENT TRAINING

Undergraduate Students

1. Bobby Hollingsworth 2015-2017
2. Jonathan Briganti 2016-2017
3. Brian Elliot 2016-2017
4. Brittney Worrell 2015-2017