

Education

- **Reed College** Portland, OR
B.A., Chemistry September 2000 - May 2004
- **Stony Brook University** Stony Brook, NY
Ph.D., Chemistry September 2004 - December 2008
Ph.D. Adviser: Prof. Peter J. Tonge

Thesis Title: *"Ultrafast vibrational studies of biological chromophores: Light-driven structural changes in yellow fluorescent protein and the bacterial blue light sensing protein, AppA"*

Employment

- **Assistant Professor** Dallas, Texas
Department of Chemistry and Biochemistry August 2020 - present
University of Texas at Dallas
- **Postdoctoral Research Associate** Durham, North Carolina
Al-Hashimi Laboratory September 2015 - July 2020
Department of Biochemistry
Duke University Medical Center
- **Outreach Manager** Durham, North Carolina
Department of Mechanical Engineering and Materials Science July 2013 - August 2015
Duke University Center for Autonomous Materials Design
- **Scientific Research Associate** Dresden, Germany
Faculty of Medicine, TU Dresden September 2010 - December 2012
- **Scientific Research Associate** Dresden, Germany
Department of Bioanalytical Chemistry, TU Dresden June 2009 - September 2010

Honors and Awards

Sept. 1 2017 - Sept. 1 2019

NIH F32 Ruth L. Kirschstein Postdoctoral Fellowship

Title: *Development and Application of IR-based methods for visualizing Hoogsteen base pairs in the Nucleosome Particle*

Publications

Postdoctoral Fellow, Duke University, USA

38. Binnewerg, B., M. Schubert, A. Voronkina, L. Muzychka, M. Wysokowski, I. Petrenko, M. Djurović, V. Kovalchuk, M. Tsurkan, R. Martinovic, N. Bechmann, A. Fursov, V. N. Ivanenko, K. R. Tabachnick, O. B. Smolii, Y. Joseph, M. Giovine, S. R. Bornstein, **A. L. Stelling**, A. Tunger, M. Schmitz, O. S. Taniya, I. S. Kovalev, G. V. Zyryanov, K. Guan and H. Ehrlich (2020). "Marine biomaterials: Biomimetic and pharmacological potential of cultivated *Aplysina aerophoba* marine demosponge." *Materials Science and Engineering: C*. 109: 110566. DOI: <https://doi.org/10.1016/j.msec.2019.110566>
37. **Stelling, A. L.***, A. Liu, W. Zeng, R. Salinas, M. Schumacher, H. M. Al-Hashimi*. (2019) "Infrared spectroscopic evidence for a G-C⁺ Hoogsteen base pair a DNA:TATA box binding protein complex". *Angewandte Chemie International Edition*. 8(35): 12010-12013. DOI: [10.1002/anie.201902693](https://doi.org/10.1002/anie.201902693) *co-corresponding authors
36. Zhou, H., B. Sathyamoorthy, **A. L. Stelling**, Y. Xu, Y. Xue, Y. Zhang, P. A. Rice, D. A. Case, and H. M. Al-Hashimi. (2019) "Characterizing Watson-Crick versus Hoogsteen base pairing in a DNA protein complex using nuclear magnetic resonance and site-specifically ¹³C- and ¹⁵N-labeled DNA". *Biochemistry* 58(15): 1963-1974. DOI: [10.1021/acs.biochem.9b00027](https://doi.org/10.1021/acs.biochem.9b00027)
35. Szatkowski, T., K. Kopczyński, M. Motylenko, H. Borrmann, B. Mania, M. Graś, G. Lota, V. V. Bazhenov, D. Rafaja, F. Roth, J. Weise, E. Langer, M. Wysokowski, S. Żółtowska-Aksamitowska, I. Petrenko, S. L. Molodtsov, J. Hubáľková, C. G. Aneziris, Y. Joseph, **A. L. Stelling**, H. Ehrlich and T. Jesionowski (2018). "Extreme biomimetics: A carbonized 3D spongin scaffold as a novel support for nanostructured manganese oxide(IV) and its electrochemical applications." *Nano Research* 11(8): 4199-4214. DOI: [10.1007/s12274-018-2008-x](https://doi.org/10.1007/s12274-018-2008-x)
34. Zdarta, J., M. Norman, W. Smułek, D. Moszyński, E. Kaczorek, **A. L. Stelling**, H. Ehrlich and T. Jesionowski (2017). "Spongin-based scaffolds from *Hippospongia communis* demosponge as an effective support for lipase immobilization." *Catalysts* 7(5): 147. DOI: [10.3390/catal7050147](https://doi.org/10.3390/catal7050147)
33. Wysokowski, M., M. Motylenko, D. Rafaja, I. Koltsov, H. Stöcker, T. J. Szalaty, V. V. Bazhenov, **A. L. Stelling**, J. Beyer and J. Heitmann (2017). "Extreme biomimetic approach for synthesis of nanocrystalline chitin-(Ti, Zr) O₂ multiphase composites." *Materials Chemistry and Physics* 188: 115-124. DOI: [10.1016/j.matchemphys.2016.12.038](https://doi.org/10.1016/j.matchemphys.2016.12.038)
32. Wysokowski, M., P. Bartczak, S. Żółtowska-Aksamitowska, A. Chudzińska, A. Piasecki, E. Langer, V. V. Bazhenov, I. Petrenko, T. Noga, **A. L. Stelling**, H. Ehrlich and T. Jesionowski (2017). "Adhesive Stalks of Diatom *Didymosphenia geminata* as a Novel Biological Adsorbent for Hazardous Metals Removal." *CLEAN - Soil, Air, Water* 45(11): 1600678. DOI: [10.1002/clen.201600678](https://doi.org/10.1002/clen.201600678)
31. Szatkowski, T., K. Siwińska-Stefańska, M. Wysokowski, **A. L. Stelling**, Y. Joseph, H. Ehrlich and T. Jesionowski (2017). "Immobilization of titanium (IV) oxide onto 3D spongin scaffolds of marine sponge origin according to extreme biomimetics principles for removal of CI Basic Blue 9." *Biomimetics* 2(2): 4. DOI: [10.3390/biomimetics2020004](https://doi.org/10.3390/biomimetics2020004)
30. **Stelling, A. L.**, Y. Xu, H. Zhou, S. H. Choi, M. C. Clay, D. K. Merriman and H. M. Al-Hashimi (2017). "Robust IR-based detection of stable and fractionally populated G-C⁺ and A-T Hoogsteen base pairs in duplex DNA." *FEBS Letters* 591(12): 1770-1784. DOI: [10.1002/1873-](https://doi.org/10.1002/1873-)

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29. Petrenko, I., V. V. Bazhenov, R. Galli, M. Wysokowski, J. Fromont, P. J. Schupp, **A. L. Stelling**, E. Niederschlag, H. Stöcker and V. Z. Kutsova (2017). "Chitin of poriferan origin and the bioelectrometallurgy of copper/copper oxide." International journal of biological macromolecules 104: 1626-1632. DOI: [10.1016/j.ijbiomac.2017.01.084](https://doi.org/10.1016/j.ijbiomac.2017.01.084)

Outreach Manager, Duke University, USA

28. Zdarta, J., L. Klapiszewski, M. Wysokowski, M. Norman, A. Kołodziejczak-Radzimska, D. Moszyński, H. Ehrlich, H. Maciejewski, **A. L. Stelling** and T. Jesionowski (2015). "Chitin-lignin material as a novel matrix for enzyme immobilization." Marine drugs 13(4): 2424-2446. DOI: [10.3390/md13042424](https://doi.org/10.3390/md13042424)

27. Wysokowski, M., I. Petrenko, **A. L. Stelling**, D. Stawski, T. Jesionowski and H. Ehrlich (2015). "Poriferan chitin as a versatile template for extreme biomimetics." Polymers 7(2): 235-265. DOI: [10.3390/polym7020235](https://doi.org/10.3390/polym7020235)

26. Wysokowski, M., I. Petrenko, M. Motylenko, E. Langer, V. V. Bazhenov, R. Galli, **A. L. Stelling**, Z. Kljajić, T. Szatkowski and V. Z. Kutsova (2015). "Renewable chitin from marine sponge as a thermostable biological template for hydrothermal synthesis of hematite nanospheres using principles of extreme biomimetics." Bioinspired Materials 1(1).

25. Wysokowski, M., K. Materna, J. Walter, I. Petrenko, **A. L. Stelling**, V. V. Bazhenov, L. Klapiszewski, T. Szatkowski, O. Lewandowska and D. Stawski (2015). "Solvothermal synthesis of hydrophobic chitin-polyhedral oligomeric silsesquioxane (POSS) nanocomposites." International journal of biological macromolecules 78: 224-229. DOI: [10.1016/j.ijbiomac.2015.04.014](https://doi.org/10.1016/j.ijbiomac.2015.04.014)

24. Bazhenov, V. V., M. Wysokowski, I. Petrenko, D. Stawski, P. Sapozhnikov, R. Born, **A. L. Stelling**, S. Kaiser and T. Jesionowski (2015). "Preparation of monolithic silica-chitin composite under extreme biomimetic conditions." International journal of biological macromolecules 76: 33-38. DOI: [10.1016/j.ijbiomac.2015.02.012](https://doi.org/10.1016/j.ijbiomac.2015.02.012)

23. Wysokowski, M., M. Zatoń, V. V. Bazhenov, T. Behm, A. Ehrlich, **A. L. Stelling**, M. Hog and H. Ehrlich (2014). "Identification of chitin in 200-million-year-old gastropod egg capsules." Paleobiology 40(4): 529-540. DOI: [10.1666/13083](https://doi.org/10.1666/13083)

22. Wysokowski, M., M. Motylenko, J. Walter, G. Lota, J. Wojciechowski, H. Stöcker, R. Galli, **A. L. Stelling**, C. Himcinschi and E. Niederschlag (2014). "Synthesis of nanostructured chitin-hematite composites under extreme biomimetic conditions." Royal Society of Chemistry Advances 4(106): 61743-61752. DOI: [10.1039/C4RA10017D](https://doi.org/10.1039/C4RA10017D)

21. Norman, M., P. Bartczak, J. Zdarta, W. Tylus, T. Szatkowski, **A. L. Stelling**, H. Ehrlich and T. Jesionowski (2014). "Adsorption of CI Natural Red 4 onto spongin skeleton of marine demosponge." Materials 8(1): 96-116. DOI: [10.3390/ma8010096](https://doi.org/10.3390/ma8010096)

Research Associate, TU Dresden, Germany

20. Wysokowski, M., M. Motylenko, H. Stöcker, V. V. Bazhenov, E. Langer, A. Dobrowolska, K. Czaczyk, R. Galli, **A. L. Stelling** and T. Behm (2013). "An extreme biomimetic approach: hydrothermal synthesis of β -chitin/ZnO nanostructured composites." *Journal of Materials Chemistry B* 1(46): 6469-6476. DOI: [10.1039/C3TB21186J](https://doi.org/10.1039/C3TB21186J)
19. Wysokowski, M., M. Motylenko, V. V. Bazhenov, D. Stawski, I. Petrenko, A. Ehrlich, T. Behm, Z. Kljajic, **A. L. Stelling** and T. Jesionowski (2013). "Poriferan chitin as a template for hydrothermal zirconia deposition." *Frontiers of Materials Science* 7(3): 248-260. DOI: [10.1007/s11706-013-0212-x](https://doi.org/10.1007/s11706-013-0212-x)
18. Wysokowski, M., V. V. Bazhenov, M. V. Tsurkan, R. Galli, **A. L. Stelling**, H. Stöcker, S. Kaiser, E. Niederschlag, G. Gärtner and T. Behm (2013). "Isolation and identification of chitin in three-dimensional skeleton of *Aplysina fistularis* marine sponge." *International journal of biological macromolecules* 62: 94-100. DOI: [10.1016/j.ijbiomac.2013.08.039](https://doi.org/10.1016/j.ijbiomac.2013.08.039)
17. Ehrlich, H., O. V. Kaluzhnaya, M. V. Tsurkan, A. Ereskovsky, K. R. Tabachnick, M. Ilan, **A. Stelling**, R. Galli, O. V. Petrova, S. V. Nekipelov, V. N. Sivkov, D. Vyalikh, R. Born, T. Behm, A. Ehrlich, L. I. Chernogor, S. Belikov, D. Janussen, V. V. Bazhenov and G. Wörheide (2013). "First report on chitinous holdfast in sponges (Porifera)." *Proceedings of the Royal Society B: Biological Sciences* 280(1762). DOI: [10.1098/rspb.2013.0339](https://doi.org/10.1098/rspb.2013.0339)
16. **Stelling, A. L.**, D. Toher, O. Uckermann, J. Tavkin, E. Leipnitz, J. Schweizer, H. Cramm, G. Steiner, K. D. Geiger and M. Kirsch (2013). "Infrared spectroscopic studies of cells and tissues: triple helix proteins as a potential biomarker for tumors." *PloS one* 8(3): e58332. DOI: [10.1371/journal.pone.0058332](https://doi.org/10.1371/journal.pone.0058332)
15. Ehrlich, H., P. Simon, M. Motylenko, M. Wysokowski, V. V. Bazhenov, R. Galli, **A. L. Stelling**, D. Stawski, M. Ilan and H. Stöcker (2013). "Extreme biomimetics: formation of zirconium dioxide nanophase using chitinous scaffolds under hydrothermal conditions." *Journal of Materials Chemistry B* 1(38): 5092-5099. DOI: [10.1039/C3TB20676A](https://doi.org/10.1039/C3TB20676A)
14. Steiner, G., L. Mackenroth, K. D. Geiger, **Stelling, A.**, T. Pinzer, O. Uckermann, V. Sablinskas, G. Schackert, E. Koch and M. Kirsch (2012). "Label-free differentiation of human pituitary adenomas by FT-IR spectroscopic imaging." *Analytical and bioanalytical chemistry* 403(3): 727-735. DOI: [10.1007/s00216-012-5824-y](https://doi.org/10.1007/s00216-012-5824-y)
13. Bo, M., G. Bavestrello, D. Kurek, S. Paasch, E. Brunner, R. Born, R. Galli, **A. L. Stelling**, V. N. Sivkov and O. V. Petrova (2012). "Isolation and identification of chitin in the black coral *Parantipathes larix* (Anthozoa: Cnidaria)." *International journal of biological macromolecules* 51(1-2): 129-137. DOI: [10.1016/j.ijbiomac.2012.04.016](https://doi.org/10.1016/j.ijbiomac.2012.04.016)
12. **Stelling, A.** and G. Steiner (2011). "Solution to living cell spectroscopy challenge." *Analytical and bioanalytical chemistry* 401(8): 2327-2327. DOI: [10.1007/s00216-011-5025-0](https://doi.org/10.1007/s00216-011-5025-0)
11. **Stelling, A.** and G. Steiner (2011). "Living cell spectroscopy challenge." *Analytical and bioanalytical chemistry* 400(9): 2681-2682. DOI: [10.1007/s00216-011-5223-9](https://doi.org/10.1007/s00216-011-5223-9)
10. **Stelling, A.**, R. Salzer, M. Kirsch, S. B. Sobottka, K. Geiger, E. Koch, G. Schackert and G. Steiner (2011). "Intra-operative optical diagnostics with vibrational spectroscopy." *Analytical and bioanalytical chemistry* 400(9): 2745-2753. DOI: [10.1007/s00216-011-5022-3](https://doi.org/10.1007/s00216-011-5022-3)

9. Steiner, G., T. Bartels, **A. Stelling**, M.-E. Krautwald-Junghanns, H. Fuhrmann, V. Sablinskas and E. Koch (2011). "Gender determination of fertilized unincubated chicken eggs by infrared spectroscopic imaging." *Analytical and bioanalytical chemistry* 400(9): 2775-2782. DOI: [10.1007/s00216-011-4941-3](https://doi.org/10.1007/s00216-011-4941-3)
8. Steiner, G., T. Bartels, **A. Stelling**, A. Burkhardt, M.-E. Krautwald-Junghanns and E. Koch (2011). "Bird sexing by infrared spectroscopy." *Spectroscopy Europe* 23(1):16. URL: spectroscopyeurope.com/article/bird-sexing-infrared-spectroscopy
7. Lukacs, A., A. Haigney, R. Brust, R.-K. Zhao, **A. L. Stelling**, I. P. Clark, M. Towrie, G. M. Greetham, S. R. Meech and P. J. Tonge (2011). "Photoexcitation of the blue light using FAD photoreceptor AppA results in ultrafast changes to the protein matrix." *Journal of the American Chemical Society* 133(42):16893-16900. DOI: [10.1021/ja2060098](https://doi.org/10.1021/ja2060098)
6. Haigney, A., A. Lukacs, R.-K. Zhao, **A. L. Stelling**, R. Brust, R.-R. Kim, M. Kondo, I. Clark, M. Towrie and G. M. Greetham (2011). "Ultrafast infrared spectroscopy of an isotope-labeled photoactivatable flavoprotein." *Biochemistry* 50(8):1321-1328. DOI: [10.1021/bi101589a](https://doi.org/10.1021/bi101589a)
5. Krafft, C., **A. L. Stelling**, J. Popp and R. Salzer (2010). "Towards clinical in vivo applications of Raman spectroscopy." *SpectroscopyEurope* 22(3):14. URL: spectroscopyeurope.com/article/towards-clinical-vivo-applications-raman-spectroscopy

Ph.D. Student, Stony Brook University, USA

4. **Stelling, A. L.**, M. Kondo, K. L. Ronayne, P. J. Tonge and S. R. Meech (2009). "Ultrafast Vibrational Dynamics in the AppA Blue Light Sensing Protein." *Ultrafast Phenomena XVI*, Springer, Berlin, Heidelberg: 538-540. DOI: [10.1007/978-3-540-95946-5_174](https://doi.org/10.1007/978-3-540-95946-5_174)
3. Malo, G. D., M. Wang, D. Wu, **A. L. Stelling**, P. J. Tonge and R. M. Wachter (2008). "Crystal structure and Raman studies of dsFP483, a cyan fluorescent protein from *Discosoma striata*." *Journal of molecular biology* 378(4):871-886. DOI: [10.1016/j.jmb.2008.02.069](https://doi.org/10.1016/j.jmb.2008.02.069)
2. **Stelling, A. L.**, K. L. Ronayne, J. Nappa, P. J. Tonge and S. R. Meech (2007). "Ultrafast structural dynamics in BLUF domains: transient infrared spectroscopy of AppA and its mutants." *Journal of the American Chemical Society* 129(50):15556-15564. DOI: [10.1021/ja074074n](https://doi.org/10.1021/ja074074n)
1. Kondo, M., J. Nappa, K. L. Ronayne, **A. L. Stelling**, P. J. Tonge and S. R. Meech (2006). "Ultrafast vibrational spectroscopy of the flavin chromophore." *The Journal of Physical Chemistry B* 110(41):20107-20110. DOI: [10.1021/jp0650735](https://doi.org/10.1021/jp0650735)

Textbook Chapters

- Petrenko, I., V. V. Bazhenov, **A. L. Stelling** and V. Z. Kutsova (2017). "Bioelectrometallurgy of Copper on Chitin." *Extreme Biomimetics*. H. Ehrlich. Cham, Springer International Publishing: 205-221. DOI: [10.1007/978-3-319-45340-8_8](https://doi.org/10.1007/978-3-319-45340-8_8)

Refereeing Service

Carbohydrate Polymers
ACS Infectious Diseases
Journal of Cancer and Clinical Oncology
Journal of Photochemistry and Photobiology
Materials & Design
Spectrochimica Acta Part A
Journal of Food Engineering
Travel Award for Graduate Women in Science (Research Triangle Chapter)

Recent Talks & Conferences

Contributed poster at the Gordon Conference on Vibrational Spectroscopy (Biddeford, ME, **2018**).

Title: *Detecting Hoogsteen Base Pairs in DNA:protein Complexes with Infrared Spectroscopy*

Contributed talk at the Biophysical Society Meeting (New Orleans, LA, **2017**).

Title: *Exploring DNA and RNA Structures in Solution with Infrared Spectroscopy*

Invited talk at North Carolina State University Department of Chemistry (Raleigh, NC, **2014**).

Title: *IR in the OR: Infrared Spectroscopy for Rapid, Non-Destructive Tissue Assessment During Brain Tumor Operations*

Contributed talk for the Scientific Exchange conference, Bioanalytical Session (Milwaukee, WI, **2013**).

Title: *Infrared Spectroscopic Studies of Cells and Tissues: Triple Helix Proteins as a Potential Biomarker for Tumors.*

Invited talk for the tumor boards at Oregon Health and Sciences University Department of Neurosurgery (Portland, OR, **2013**).

Title: *Vibrational Spectroscopy for Rapid Intraoperative Optical Pathology.*

Invited talk for the CRTD Symposium on Innovative Technology for Biology and Medicine (Dresden, Germany, **2012**).

Title: *Vibrational Spectroscopy for Tumor Diagnostics: from Quantum Mechanics to Tissue Biology.*