CURRICULUM VITAE

Joshua J. Timmons, B.S.

PERSONAL

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RESEARCH INTERESTS

I am interested in studying biological phenomena through simulation paired with laboratory observation. My current research focus is on elucidating mechanisms behind Tumor Treating Fields (TTFields) and Nanosecond Pulsed Electric Fields. Microscopy has correlated both with a breakdown in tubulin networks. My approach is to use nonequilibrium molecular dynamics to compare the motion of a tubulin model with and without strong external electric fields. Other interests include software engineering and synthetic biology.

EDUCATION

2012 - 2016 — B.S. in Biology, **Northeastern University**, Boston, MA

Bioinformatics Programming, Bioinformatics Methods 1, Fundamentals of Computer Science 2, Biological Electron Microscopy, Plant Biotechnology, Biochemistry, Genetics & Molecular Biology, Cell & Molecular Biology, Organic Chemistry 1, Organic Chemistry 2, Applied Econometrics, Statistics and Software.

EXPERIENCE

2016 - Present — Software Engineer**, Lattice Automation Inc**., Boston, MA

Building tools for synthetic biologists with C#, Java, Javascript, MongoDB, and Python. Emphasis on automated plasmid design and visualization. Individually wrote, from scratch, a yeast assembly engine for DowDupont to automate to their vector design process through a combination of PCR, restriction digest and DNA synthesis.

2014 - Present — Research Assistant, **Beth Israel Deaconess Medical Center and Harvard Medical School**, Boston, MA

Screening biomarkers for Glioblastoma multiforme using tissue samples and murine models. Survival analysis of clinical trial data and patient records in the literature. Image processing workflows for generating finite element analysis meshes from patient MRIs. Molecular dynamics simulations of highly charged proteins to investigate TTFields' mechanism.

2015 - 2016	Founder and Captain, **iGEM Northeastern**, Boston, MA Conversion of microalgae expression plasmids to the BioBrick standard. Creation and submission of Nox and Proteorhodopsin iGEM parts for use in microbial fuel cells. Comparison of Anderson promoter strengths using GFP fluorescence.
2013 - 2014	Research Student, **Northeastern University**, Boston, MA Microbial culturing of samples from Greenland. Screening with PCR and MALDI-TOF to understand temporal population changes.

PUBLICATIONS

Refereed Journal Articles

(7) **Timmons, J.J.,** Preto, J., Tuszynski, J.A., & Wong E.T. (2018). Tubulin's response to external electric fields by molecular dynamics simulations. *PLoS One.*

(6) **Timmons, J.J.,** Zhang, K., Fong, J., Lok, E., Swanson, K.D., Gautam, S., & Wong, E.T. (2018). Literature Review of Spinal Cord Glioblastoma. *American Journal of Clinical Oncology*.

(5) Ortiz, J., Carr, S.B., Pavan, M., McCarthy, L., **Timmons, J.J.,** & Densmore, D.M. (2017). Automated Robotic Liquid Handling Assembly of Modular DNA Devices. *Journal of Visual Experiments.*

(4) **Timmons, J.J.,** Lok, E., San, P., Bui, K., & Wong, E.T. (2017). End-to-End Workflow for Finite Element Analysis of Tumor Treating Fields in Glioblastomas. *Physics in Medicine & Biology.*

(3) Patnaik, A., Swanson, K.D., Csizmadia, E., Solanki, A., Landon-Brace, N., Gehring, M.P., Helenius, K., Olson, B.M., Pyzer, A.R., Wang, L.C., Elemento, O., Novak, J., Thornley, T.B., Asara, J.M., Montaser, L., **Timmons, J.J.,** Morgan, T.M., Wang, Y., Levantini, E., Clohessy, J.G., Kelly, K., Pandolfi, P.P., Rosenblatt, J.M., Avigan, D.E., Ye, H., Karp, J.M., Signoretti, S., Balk, S.P. & Cantley, L.C. (2017). Cabozantinib eradicates advanced murine prostate cancer by activating anti-tumor innate immunity. *Cancer Discovery.*

(2) **Timmons, J.J.,** Cohessy, S., & Wong, E.T. (2016). Injection of Syngeneic Murine Melanoma Cells to Determine Their Metastatic Potential in the Lungs. *Journal of Visual Experiments.*

(1) Wong, E.T., **Timmons, J.J.,** Callahan, A., O'Loughlin, L., Giarusso, B., & Alsop, D.C. (2016). Phase 1 study of low-dose metronomic temozolomide for recurrent malignant gliomas. *BMC Cancer*.

Conference Proceedings

(5) **Timmons, J.J.,** Pyay, S., Bui, K., Lok, E., & Wong, E.T. (2017). End-to-End Workflow for Finite Element Analysis of Tumor Treating Fields in Glioblastomas. *American Neurological Association*. Oral presentation & poster

(4) San, P.P., **Timmons, J.J.,** Lok, E., Swanson, K.D., & Wong, E.T. (2016). Analysis of Glioblastoma Physical Characteristics in Patients Benefiting from Tumor Treating Electric Fields Therapy. *Society for Neuro-Oncology.* Poster

(3) **Timmons, J.J.** (2015). Therapeutic antibody expression in microalgae. *International Genetically Engineered Machine.* Oral presentation & poster

(2) Doerfert, S., Berdy, B., Wunschel, E., Sizova, M., **Timmons, J.J.,** Jung, D., Kruppa, G., & Epstein, S. (2014). MALDI-TOF applications for dereplication and identification of environmental microorganisms isolated from Thule, Greenland. *International Society for Microbial Ecology.* Poster

(1) Berdy, B., Sizova, M., Kaluziak, S., Doerfert, S., Wunschel, E., **Timmons, J.J.,** Jung, D., Torralba, M., Haft, D., Nelson, K., & Epstein, S. (2014). Towards predictable manipulation of microbial communities. *International Society for Microbial Ecology.* Poster

Other Publications

(1) Beal, J., Haddock-Angelli, T., Gershater, M., de Mora., K., Lizarazo, M., Hollenhorst, J., Rettberg, R., & **iGEM Interlab Study Contributors.** (2016). Reproducibility of Fluorescent Expression from Engineered Biological Constructs in E. coli. *PlosOne.*

AWARDS AND FUNDING

2016	University Honors Program Distinction
2016	Advanced Research and Creative Endeavor Award, $3,000
2015 - 2016	iGEM Northeastern College and Department Fundraising, $15,000
2015 - 2016	iGEM Northeastern Corporate Fundraising, $1,600
2012 - 2016	Northeastern National Merit Scholarship, $42,000/year
2012 - 2016	UPS Foundation National Merit Scholarship, $6,000/year
2015	Above & Beyond CEP Award

LEADERSHIP AND MENTORING

2015 - 2016	Founder and Captain, **Northeastern iGEM Team**
2013 - 2016	President, Editor, and Writer, **NUScience Magazine**
2015	Peer Mentor, **Northeastern Peer Program**
2014	TA and Mentor, **Northeastern Honors Mentors Program**

SOFTWARE SKILLS

Operating Systems	Fedora Linux, Ubuntu Linux, Windows, MacOS
Languages	Java, R, C#, Python, TCL, MATLAB, JavaScript, Perl, Golang
Databases	MongoDB, MySQL

Applications and Services	Amazon Web Services, NAMD, VMD, R, Matplotlib, PyMOL, Studio, Bash, Git, Benchling, Node, NPM, Vaadin, Adobe Illustrator, CircleCI, GraphQL

LABORATORY SKILLS

General	Western blot, ELISA, PCR, microbial culturing, tissue culturing, MALDI-TOF, Bradford assay, DNA extraction, DNA electrophoresis, DNA purification
Synthetic Biology	Gibson assembly, MoClo assembly, restriction digest, transformation
Mouse Handling	Intraperitoneal injection, tail vein injection, osmotic pump surgery
Imaging	Transmission electron microscopy, scanning electron microscopy