

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 image processing, synthetic biology, and software engineering.

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 Java, Javascript, MongoDB, and Python. Emphasis on combinatorial design, visualization, and robotic assembly planning.

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

- (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*. Accepted
- (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*.

Manuscripts in Submission

- (1) **Timmons, J.J.**, Zhang, K., Fong, J., Lok, E., Swanson, K.D., Gautam, S., & Wong, E.T. (2017). Literature Review of Spinal Cord Glioblastoma. *American Journal of Clinical Oncology*. In revision

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

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| 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

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| 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

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| Operating Systems | Fedora Linux, Ubuntu Linux, Windows, MacOS |
| Languages | Java, Python, JavaScript, TCL, MATLAB, R, Perl, Golang |
| Databases | MongoDB, MySQL |
| Applications and Services | Amazon Web Services, NAMD, VMD, R Studio, Bash, Git, Benchling, Node, NPM, Vaadin, Adobe Illustrator, CircleCI, GraphQL |

LABORATORY SKILLS

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| 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 |