

# Ian D. Dryg, Ph.D.

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## Innovative and motivated scientist looking for exciting research opportunities.

- Experienced research scientist with 7 years of academic experience using histology, microscopy, and flow cytometry to study the brain tissue response to implanted biomaterials for brain-computer interfaces: biocompatibility, inflammation and immune response, and the foreign body reaction.
- Project management, clear organizational skills, and leadership experience in an academic setting.
- Enthusiastic about teamwork and working in a cross-functional, collaborative environment.
- Excellent written and oral communication skills with a strong publication history and proven ability to present scientific information to colleagues.
- Strong interest in gaining more experience with immunology, NGS, and bioinformatics/data science.

### SKILLS

Technical Expertise	Computational	Molecular Biology
<ul style="list-style-type: none"><li>• Confocal Microscopy</li><li>• Immunohistochemistry (IHC)</li><li>• Electron Microscopy</li><li>• Flow Cytometry</li><li>• Bioconjugation (EDC:NHS)</li><li>• Electrophysiology</li><li>• Polymer Chemistry</li></ul>	<ul style="list-style-type: none"><li>• MATLAB</li><li>• Python</li><li>• Java</li><li>• Learning SQL</li><li>• Data Analysis &amp; Presentation</li><li>• Image Analysis</li><li>• FIJI (ImageJ)</li><li>• Microsoft Office (Excel, Powerpoint, Word)</li></ul>	<ul style="list-style-type: none"><li>• Primary Cell Isolation</li><li>• ELISA</li><li>• Cell Culture</li><li>• PCR</li><li>• Protein Chemistry</li></ul>

### EXPERIENCE

GRADUATE RESEARCHER (PhD in Bioengineering) 2013 – 2019  
**University of Washington – Advisors: Buddy Ratner, James Bryers, Bill Shain** Seattle, WA

- Extensive experience implementing *in vivo* and *in vitro* experiments to understand the effects of engineered biomaterial parameters on the foreign body reaction resulting in data for several publications and pilot grant funding of \$50,000 (Institute for Translational Health Sciences at UW).
- Completed immunohistological analyses (IHC, fluorescence) on various tissues (primarily CNS) from end to end: animal implant surgeries, tissue preparation in sectioning, antibody staining, tissue clearing or expansion, fluorescence microscopy, data acquisition, analysis and data visualization.
- Led development of pHEMA/GMA co-polymer with stiffness/pore tunability for device/tissue interfacing.
- Published multiple articles in peer reviewed journals.
- Presented scientific talks and posters at 15+ internal and 4 international conferences.
- Built network of local collaborators in order to facilitate polymeric brain implant testing in a rat model.
- Isolated primary immune and neurological cells and performed multi-parameter flow cytometry including panel design and data analysis in FCS Express, FlowJo and Excel.
- Maintained familiarity with advances in the field and with scientific literature to become a subject matter expert for flow cytometry, electron and confocal microscopy, regenerative biomaterials, and brain-computer interfaces.
- Mentored, supervised, and trained 1 undergraduate and 1 graduate student researcher who have continued successful scientific and medical careers.

GRADUATE RESEARCHER (MS in Biomedical Engineering) 2012 – 2013  
**Purdue University – Advisor: Pedro Irazoqui** West Lafayette, IN

- Designed and conducted an *in vivo* study testing the functionality and brain tissue response to flexible microwire electrodes using a novel magnetic insertion method resulting in 1 first author peer reviewed article.
- Designed and fabricated in-house amplifiers, electrophysiology rig, and neural signal processing program (MATLAB/Labview).

UNDERGRADUATE RESEARCHER (BS in Biomedical Engineering)

2010 – 2012

**Purdue University**

**West Lafayette, IN**

- Assisted in development of implantable devices and biosensors for research in epilepsy, glaucoma, and prosthetics (Advisor: Pedro Irazoqui).
- Processed blood samples to collect cytokines and cells, performed assays to determine effects of treatment (Advisor: Alyssa Panitch).

#### EDUCATION

PHD – BIOENGINEERING

2019

**University of Washington**

**Seattle, WA**

MASTER OF SCIENCE – BIOMEDICAL ENGINEERING

2013

**Purdue University**

**West Lafayette, IN**

BACHELOR OF SCIENCE – BIOMEDICAL ENGINEERING (Minor: Mathematics)

2012

**Purdue University**

**West Lafayette, IN**

#### SELECT PRESENTATIONS

- 2019 Society for Biomaterials – Seattle, WA
  - Porous Hydrogels for Neural Implants: Effect of Pore Size on Glial Encapsulation
- 2018 NeuroFutures Conference – Seattle, WA
  - Directing Brain Tissue Integration for Long-Term Electrophysiology with Conductive Microporous Hydrogel Electrodes
- 2018 Gordon Research Conference for Neuroelectronic Interfaces – Galveston, TX
  - Directing Brain Tissue Integration for Long-Term Electrophysiology with Conductive Microporous Hydrogel Electrodes
- 2017 SPIE Photonics West – San Francisco, CA
  - Online Monitoring of Tissue Responses to Plasma Coated Rigid Neural Implants using Fiber-based Optical Coherence Tomography
- 2014 NSF Site Visit: UW Center for Sensorimotor Neural Engineering – Seattle, WA
  - Correlating tissue responses with recording performance of implanted and brain-surface electrodes
- 2013 Cyberonics, Inc. Visit – Houston, TX
  - Educational Class on Neuroscience and Neural Interfaces for Employees of Cyberonics, Inc.
- 2012 American Epilepsy Society Annual Meeting – San Diego, CA
  - Magnetically Inserted Flexible Microelectrodes Reduce the Reactive Tissue Response

#### PUBLICATIONS

- 2020 **I. Dryg**, Y. Xie, M. Bergmann, G. Urban, W. Shain, U.G. Hofmann. "Long-term in vivo Monitoring of Gliotic Sheathing of Ultrathin Entropic Coated Brain Microprobes with Fiber-based Optical Coherence Tomography." bioRxiv (2020). Preprint.
- 2017 C. Boehler, C. Kleber, N. Martini, Y. Xie, **I. Dryg**, T. Stieglitz, U. Hofmann, M. Asplund. "Actively controlled release of Dexamethasone from neural microelectrodes in a chronic in-vivo study." Biomaterials (2017). Print.
- 2016 Noah Goshi, M. Vomero, **Ian Dryg**, S. Seidman, Sam Kassegne. "Modeling and Characterizing of Tissue/Electrode Interface in Capacitive ECoG Glassy Carbon Electrodes." ECS Transactions. (2016)
- 2016 Maria Vomero, **Ian Dryg**, Tyler Maxfield, William Shain, Steve Perlmutter, Sam Kassegne. "In-Vivo characterization of Glassy Carbon-Electrodes and Histological Analysis of Brain Tissue after Chronic Implants." ECT Transactions. (2016)
- 2015 **Dryg, Ian**, Matthew Ward, Kurt Qing, Henry Mei, Jeremy Schaffer, and Pedro Irazoqui. "Magnetically Inserted Neural Electrodes: Tissue Response and Functional Lifetime." Transactions on Neural Systems and Rehabilitation Engineering (2015). Print.