

Charles V. Fracchia

17 Jay Street
Cambridge, MA 02139
USA

charlesfracchia@gmail.com
+1 (857) 210-8836
www.charlesfracchia.com

Education

- 2007 – 2011 **Imperial College London** (2:1 Honours) *London, United Kingdom*
- Bachelor of Science in **Biology** with a Year in Industry
- Associateship of the Royal College of Science
 - Industry year spent working at Ginkgo Bioworks (*Boston, MA*)
- Modules*
- Advanced Molecular Biology / Statistics / Bacterial Physiology / Immunology / Virology / Genetics & Genomics / Integrative Systems Biology / Synthetic Biology / Biotechnology and Business / German
- Thesis* “Engineering a potassium efflux pump as a cyborg reporter in synthetic biology”
- Designed and transformed plasmid constructs
 - Produced and characterized novel K⁺ sensor
 - *Supervisor:* Dr Tom Ellis

Research Experience

- 2011-present **Church Lab Wyss Institute Harvard Medical School** *Boston, MA*
- Design and experimentation of novel DNA origami applications
 - Optimising the high volume production of Phage backbone DNA used in origami folding
- 2011 **IBM Research** *Yorktown Heights, NY*
- Tested the in vivo usability of the bio-electronic interface designed during thesis work at Imperial College London
 - Designed and implemented new technologies to enhance biological research in a laboratory environment. These include a wireless high impedance pH meter used to measure K⁺ concentration in vivo, a wireless dongle for communicating with lab equipment and automatically collecting data from them and a web-based interface to display all the aggregated data in a useful manner
- 2009 – 2010 **Ginkgo Bioworks** *Boston, MA*
- Designed and implemented an automated DNA assembly pipeline
 - Developed a set of protocols for the various robotic platforms
 - Created software (Ruby on Rails) protocols to be integrated to the custom Laboratory Information Management System (LIMS) which linked resources management to the experimental protocols used in the laboratory
 - Maintained and Integrated different automation platforms together to create a pipeline to increase throughput and decrease the time of iteration when creating engineered bacterial organisms
 - Platforms: Beckman Coulter Biomek FX and Qiagen BioRobot 8000
- 2009 **Imperial College iGEM team** *London, United Kingdom*
- Developed an auto-encapsulable E. coli to deliver proteins to the intestine
 - Tested the different parts of the three different modules constituting our project
 - Led the Human Practices project and built website
- 2008 **Pasteur Institute** *Brussels, Belgium*
- Laboratory of Mycobacterial Immunology
- Assisted a team in the development and testing of a novel DNA-based vaccine against Mycobacterium tuberculosis
 - *Techniques used:* Plasmid purification and sequencing, RNA purification Electroporation
- Laboratory of Cellular Microbiology
- Assisted the study of a molecular cascade leading to apoptosis
 - *Techniques used:* Mammalian cell culture, FACS, SDS-PAGE, Chemoluminescent western blot

- 2006 **Steria** *Brussels, Belgium*
- Contributed to the Schengen Information System (SIS II): software for the exchange of police information between member countries. I developed a PHP program to report test results from the application's performance and compliant with European Commission regulations
 - Worked under confidentiality clause

Publications / Presentations

- 2011 **Speaker at International BioEngineering conference** *Indianapolis, IN*
 Title of the talk: Engineering Programmable Potassium Efflux as a Cyborg Reporter Mechanism in Synthetic Biology
- 2011 **Speaker at MIT T=0 Entrepreneurship Event** *MIT, MA*
 Title of the talk: Why biological prototyping sucks and how to fix it.
 Presented the technologies I have developed to automate and assist scientists in research. They include a novel touch-based computing interface, radio-enabled dongles to automatically collect data from laboratory equipment and software to analyse and display the multiple streams of collected data
- 2011 **Poster presentation at IBM Research** *Yorktown Heights, NY*
 Presented the K⁺-based novel reporter developed at Imperial College and its applications. The reporter system is designed to produce more quantitative data
- 2009 **iGEM** *MIT, MA*
 Presented the encapsulator project and the genetic circuitry designed. The project wiki is available at: http://2009.igem.org/Team:Imperial_College_London

Awards / Fellowships

- Present **IBM Ph.D. Fellowship** *Cambridge, MA*
 Starts at the end of first year of Ph.D. program and continues until graduation
- 2010 **Awesome Foundation Fellowship** *Cambridge, MA*
 Awarded for the development of bioengineered inks using fluorescent protein-producing *E. coli*
- 2009 **iGEM 2009** *MIT, MA*
 Finalist team, Winner of the Manufacturing track prize, Best Human Practices prize with Paristech

Computational Skills

Biological software: Pymol, CADnano, Qiasoft, Biomek FX software, Vector NTI

Programming and Web Design: Java, Ruby, Python, MATLAB, R, Visual Basic, HTML, CSS, PHP, Javascript

Graphics and Fabrication: Maya, Photoshop, ReplicatorG

Languages

Fluent in: **French, Italian, English** and **Spanish**

Conferences

- 2012 **International BioEngineering conference (Speaker)** *Indianapolis, IN*
- 2011 **MIT T=0 Entrepreneurship Event (Speaker)** *MIT, MA*
- 2011 **IBM Research Poster Session (Speaker)** *Yorktown Heights, NY*
- 2010 **Genopole Synthetic Biology Conference** *Evry, France*
- 2010 **Centre for Synthetic Biology and Innovation Fall Symposium** *London, UK*
- 2010 **iGEM Jamboree** *MIT, MA*
- 2010 **Institute of Biological Engineering Annual Meeting** *Cambridge, MA*
- 2010 **Outlaw Biology? Public Participation in the Age of Big Bio (Speaker)** *UCLA, CA*
- 2009 **iGEM Jamboree** *MIT, MA*

References

- Prof. George Church** Wyss Institute, Harvard Medical School *Boston, MA*
- Dr Tom Ellis** Imperial College, Thesis supervisor *London, United Kingdom*
- Dr Tom Knight** MIT, Founder at Ginkgo Bioworks *Boston, MA*
- Stephen Heisig** IBM Research, Supervisor *Yorktown Heights, NY*