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# Eliseo Papa

*Biomedical Engineer, Computational Biologist, Data Scientist*

## Current position

MBBS Candidate, Graduate Entry Medicine, Imperial College London

Researcher, Alm lab, MIT

### Areas of specialization

Medical Engineering, Analysis of large data sets, Microbiome, Machine learning, Immunology, Optics, Nano/microfabrication, Phylogenetics.

### Research interests

Host-pathogen interactions at the level of microbiome and single cells. Human Microbiome Project. High-throughput diagnostics. Electronic health records. Emerging properties of networks in a biological and social context. Self-organized systems.

## Languages

Italian: Mother tongue
English: Perfect oral & written fluency
French: Working knowledge

## Education

2009–now **Imperial College London** : MBBS Graduate Entry Medicine Programme

2006–2012 **Harvard Medical School & Massachusets Institute of Technology** : PhD, Biomedical Engineering,
Harvard/MIT Health Science & Technology Institute
Thesis: High-throughput experimental and computational tools for exploring immunity and the microbiome
Representative courses:
*Harvard Medical School* - pathology, renal pathophysiology, respiratory pathophysiology, cardiac pathophysiology.
*MIT* - biomechanics, statistical learning, systems microbiology, forces fields and flows in biological systems, fluid mechanics, heat transfer, numerical modeling.

2006–2008 **Massachusets Institute of Technology** : SM in Mechanical Engineering

2001–2005 **University of Toronto** : BASc (Honors) Engineering Science (Biomedical Option)

## Fellowships

2010–2011 NSERC Postgraduate D Scholarship, National Science Engineering Research Council, Canada

2008–2009 Poitras pre-doctoral fellowship

2007 Martino Scholar, Harvard/MIT Health Science Tech. Inst.

2005–2008 NSERC Postgraduate M Scholarship, National Science Engineering Research Council, Canada

2005 OGS Postgraduate Scholarship (declined), Ontario Government, Canada

2004 NSERC Summer Research Award, National Science Engineering Research Council, Canada

2003 #2 Canadian Army University Course Undergrad Scholarship,University of Toronto

## Honors & awards

2012 Bursary recipient, *Exploring Human Host-Microbiome Interactions in Health and Disease*, Wellcome Trust Scientific Conferences

2008 Martha Gray Prizes for Excellence in Research, Annual Forum, Harvard/MIT Health Science Tech. Inst.

2008 Competition Semifinalist, MIT 100k Business Plan

2004 University of Toronto Life Sciences Award, University of Toronto

2002–04 Silver T – academic athletic excellence, University of Toronto

2003 OUA Academic Achievement Award, Ontario, Canada

2001 Ontario Scholar, Government of Ontario, Canada

## Publications

### Journal articles

*Eliseo Papa*, Michael Docktor, Christopher Smillie, Sarah Weber, Sarah Pacocha Preheim,Dirk Gevers,Georgia Giannoukos, Dawn Ciulla, Diana Tabbaa, Jay Ingram, David B Schauer, Doyle V Ward, Joshua R Korzenik, Ramnik J Xavier, Athos Bousvaros, Eric J Alm.
Non-invasive mapping of the gastrointestinal microbiota identifies children with inflammatory bowel disease. **PLoS One**. 2012;7(6):e39242.

Rhiannon White, Sachiko Miyata, *Eliseo Papa*, Eric Spooner, Kleoniki Gounaris, Murray Selkirk, Katerina Artavanis-Tsakonas.
Characterisation of the Trichinella spiralis deubiquitinating enzyme, TsUCH37, an evolutionarily conserved proteasome interaction partner. **PLoS Negl Trop Dis.** 2011 Oct;5(10):e1340.

Katerina Artavanis-Tsakonas, Pia V Kasperkovitz, *Eliseo Papa*, Michael L Cardenas, Nida S Khan, Annemarthe G Van der Veen, Hidde L Ploegh and Jatin M Vyas.
The Tetraspanin CD82 is Specifically Recruited to Fungal and Bacterial Phagosomes Prior to Acidification. **Infection and Immunity** 2011 79(3):1098-106\

Adebola Ogunniyi, Craig Story, *Eliseo Papa*, Eduardo Guillen, J. Christopher Love.
Screening Individual Hybridomas by Microengraving to Discover Monoclonal Antibodies. **Nature Protocols** 2009 4(5):767-82

Jehnna L. Ronan, Craig Story, *Eliseo Papa*, J. Christopher Love. Optimization of the surfaces used to capture antibodies from single hybridomas reduces the time required for microengraving. **Journal of Immunological Methods** 2009, 340(2):164-9\

Craig Story*, *Eliseo Papa** *(co-author)*, Chih-Chi Andrew Hu, Jehnna L Ronan, Hidde L Ploegh, J.Christopher Love.
Profiling Antibody Responses by Multiparametric Analysis of Single B Cells. **PNAS** 2008 105(46):17902-7

Hans Fischer, *Eli Papa*, Lichuan Liu, K. Sandy Pang, Warren C. W. Chan.
Preliminary Results: Exploring the Interactions of Quantum Dots with Whole Blood Components. **SPIE Proceedings** 2005 5969,54

Wen Jiang, *Eli Papa*, Hans Fischer, Sawitri Mardyani, Warren C.W. Chan.
Semiconductor quantum dots as contrast agents for whole animal imaging. **Trends in Biotechnology** 2004 22:12

### Posters

2012 White RR, Morrow M, Miyata S, Papa E, Spooner E, Selkirk M, Gounaris K, Das C, Artavanis-Tsakonas K
Characterisation of the Trichinella Spiralis Deubiquitinating Enzyme, TsUCH37
*Molecular and Cellular Biology of Helminth Parasites VII*

2012 Eliseo Papa, Michael Docktor, Christopher Smillie, Sarah Weber, Sarah P. Preheim, Dirk Gevers, Georgia Giannoukos, Dawn Ciulla, Diana Tabbaa, Jay Ingram, David B Schauer, Doyle V Ward, Joshua R Korzenik, Ramnik J Xavier, Athos Bousvaros, Eric J Alm.
Diagnosing IBD from the fecal microbiome
*Exploring Human Host-Microbiome Interactions in Health and Disease, Wellcome Trust Scientific Conferences*

2008 High-Throughput and High-Content Screening of Antibody Responses from Single Cells
*AIChE annual meeting, Nanoscale Science Engineering Forum*

2008 Applying Ligands to B Cell Receptors by Microfluidics
*AIChE annual meeting, Engineering Fundamentals in Life Sciences*

2008 Microengraving for high-throughput affinity mapping of humoral responses
*Harvard/MIT HST Forum*

2008 Multi-variate profiling of B cell immune responses
*Novartis Vaccine Symposium*

## Patents

2009 Composition of an Array of Microwells with an Integrated Microfluidic System, USA Serial No. 12/390279

## Research experience

2009–present **Alm Laboratory for Microbiology, Prof. Eric J. Alm**, MIT : - Human Microbiome Project - Bioinformatic analysis of large datasets - Microbial evolution, phylogenetics

2006–2009 **Laboratory of Hidde L. Ploegh**, Whitehead Institute, MIT : - Affinity and isotype mapping of antibody secretion in individual primary B cells. - Development of computational and statistical tools to monitor and predict evolution of immune responses - Murine antibody cloning and expression; fluorescence tagging - Real time fluorescence microcopy; advanced image analysis

2004–2005 **Biomedical Nanotechnology Group, Prof. W C. Chan**, University of Toronto : - Nanoparticles cytotoxicity - Quantum Dots synthesis and characterization (TEM, Absorption, PL, X-IRD) - Real time fluorescence microscopy, single molecule spectroscopy and biophysics.

2003 **Biomaterials Group, Prof. M.C.Tanzi**, Politecnico di Milano, Italy : - Synthesis of biocompatible polymeric scaffolds for tissue engineering applications. - Morphological, mechanical and functional characterization of polyurethane scaffolds.

## Other employment

2006 ESL Teacher, Inlingua Language School, Brescia, Italy : - Teaching approx. 12hrs/week on individual basis and to large groups - Provided on site focussed training for companies

2004–2005 Residence Don, St.Michael's College Residence, University of Toronto : - Mediate conflicts and provide academic or personal consulting. - Trained in cultural competence and conflict resolution - Responsible to enforce rules and to foster an accepting community

2000–2002 IT Consultant System Admin, Ital Engineering s.a.s., Brescia, Italy : - Interviewed the customer and performed an organizational analysis - Regularly performed formal presentations to the management

2000 Graphic Designer, Photo Image Studio, Brescia, Italy : - Assisted photographers in the preparation of gallery exhibitions and openings

## Extracurricular

2006–2008 Collegiate Cycling. MIT Cycling Team : - National Collegiate Road Champions - Eastern Collegiate Cycling Conference Road Champions - *Captain*, Cyclocross, $2^{nd}$ US National Championship - Eastern Collegiate Cycling Conference Road Champions - Cyclocross, US National Champions

2006 Competitive Triathlon. Team Atletica Desenzano : - 9th cat. at ITU Bardolino's International Triathlon

2003–2004 Competitive Sailing. Italian sailing federation (FIV). : - 12th at European IMS Sailing Championship - 6th at Canadian J105 Championship

2004 Engineers Without Borders. : - University of Toronto Conference delegate

2002 University of Toronto Varsity Waterpolo. : - OUA Conference Champions

1998–2001 Nuoto Club Brescia Swimming Club : - Regional level competitions

## Volunteering

2005 Field Operative, AISPO, San Raffaele del Monte Tabor Foundation, Milan, Italy : - Streamlined diagnostic routines, Kampala's Hospital & Gulu's outpost, Uganda - Consulted regarding the infrastructure, human resources and logistics of the Kampala's hospital

## Interests

Listening avidly to Jazz music. International relations. Semiotics and its implications on mass psychology. Buddhism, Zen and oriental philosophies. Reading classics of Italian and English literature. Travelled by kayak along the

major European rivers. Rock Climbing.