ALEXANDRE ALBANESE

Education

Ph.D. Biomedical Engineering, University of Toronto

2014

2006

- Supervisor: Warren Chan
- Thesis: "Characterizing the Role of Nanoparticle Design on Tumor Transport and Stability in the Extracellular Environment"
- Synthesis, functionalization and characterization of nanoparticles
- Evaluation of nanoparticle interactions with proteins, cells and micro-tissues
- Development of microfluidic model for tissue transport
- Supervised graduate and undergraduate students

M. Sc. Microbiology & Immunology, McGill University

- Supervisor: Ciro Piccirillo
- Thesis: "Functional impact of the protective *Idd3* allele on regulatory T cells and protection from type-1 diabetes"
- Evaluation of suppressor T cells
- Adoptive transfer of cells into mice and analysis of tissues with flow cytometry
- Supervised undergraduate student
- B. Sc., Microbiology & Immunology, McGill University 2004
 - Thesis: "Proteome Characterization of Regulatory T cells" with Ciro Piccirillo
 - Graduated with first class honours, CGPA = 3.56/4

Research

Postdoctoral Fellow, Picower Institute at M.I.T. (Cambridge, MA) 2016-

- Supervisor: Kwanghung Chung
- Recipient of a NSERC fellowship from Canada
- Developing vascularized brain organoids
- Developing tools to image cell-cell and cell-matrix interactions at the nanoscale

Postdoctoral Fellow, Koch Institute at M.I.T. (Cambridge, MA) 2014-2015

- Supervisor: Sangeeta Bhatia
- Recipient of a NSERC fellowship from Canada
- Developing ultrasmall assembled nanomaterials for urine-based cancer detection
- Developing metastatic-targeting nanoparticles
- Developing assays to probe nanoparticle transport in decellularized liver matrix

Research Technician, Vasogen Inc. (Toronto,ON)

- Worked on synthetic immune-modulating liposomes
- Designed and developed ELISA-based assay to monitor liposome-mediated immuno-suppression of murine leukocytes
- Responsible for reagent ordering

Associate Scientist, GSK Biologicals (Laval, Qc)

• Protein synthesis for vaccine development

2008

- Extraction, purification and refolding of recombinant proteins
- Characterization of recombinant proteins
- Evaluation of epithelial cell inflammatory response using ELISA and flow cytometry

Research Assistant, McGill University (Montreal,Qc)

- Supervisor: Samantha Gruenheid
- Worked with mouse model for Enterohaemorrhagic E.coli (EHEC)
- Administered bacteria by oral gavage and monitored bacterial load in the colon and feces
- Developed an organized system for product ordering

Teaching Experience

Instructor, University of Toronto (Toronto,ON)

- DaVinci Engineering Enrichment Program (DEEP) Summer Academy
- Participated in yearly Instructor Training Conference
- Taught "Nanomedicine: Improving Medicine with Nanotechnology" to high school students (grade 10-11)
- Co-created, prepared and presented 25h course (slides, activities and experiments)
- Ranked highly on student satisfaction survey

Teacher's assistant, University of Toronto (Toronto,ON)

- BME340: Biomedical Engineering Instrumentation & Technology
- Taught and supervised ~40 students how to use ELISA, Spectrometer, fluorescent microscope
- Designed slides for course instructor
- Corrected lab reports, evaluated poster presentations

Workshop, University of Toronto (Toronto,ON)

- Faculty of Applied Sciences & Engineering workshop for prospective students
- Organized and prepared the Nano-Forensics component

Teacher's assistant, McGill, (Montreal, Qc)

- MIMM413: Parasitology
- Taught and supervised group of 16 students throughout semester
- Corrected multiple reports and exams
- Rated highly by students (>90%) during their course evaluation

Community

- Glimpse Podcast, MIT Postdoctoral Association (Cambridge, MA) 2015-present
 - Awarded grant by MIT postdoctoral association to start podcast
 - Creator, producer, host, editor, and audio engineer of Glimpse podcast
 - Will release episodes interviewing postdocs and researchers around MIT campus
 - Launches late September 2015

IBBME Podcast, University of Toronto (Toronto, ON)

- Creator, producer, audio engineer and host of IBBME: Focal Point podcast
- Interviewed multiple faculty members to highlight research
- Worked under mentorship of the Communications Officer
- Recruited, trained and managed volunteers to take over the project

Reviewer, ACS Nano (American Chemical Society Publications)

2012-2014

2006

2010-2011

2010-2012

2010-2012

2006

• Reviewed >5 manuscripts investigating nanoparticle-biological interactions

Reviewer, Scientific Reports (Nature Publishing Group)

Reviewed a manuscript investigating nanoparticle-immune cell interactions

Reviewer, Journal of Nanoparticle Research (Springer)

2011-present

2012-2014

2012-present

Reviewed >3 manuscripts investigating nanoparticle-biological interactions

IBBME, University of Toronto (Toronto, ON)

- Participated in student recruitment event at McGill University (Montreal, Qc) in November 2013
- Member of the 2013 Scientific Day organizing committee
- Selected to participate in "2013 Departmental Website Re-design Committee"

Publications

https://scholar.google.ca/citations?user=I2VwAU0AAAAJ&hl=en

Albanese A, Chung K. Whole-brain imaging reaches new heights (and lengths). Elife. 2016 Jan 20;5. pii: e13367. doi: 10.7554/eLife.13367.

Albanese A*, Walkey CD*, Olsen J, Gao H, Emili A, and Chan WC. Secreted cellular proteins alter nanoparticle-cell interactions. ACS Nano. 2014 Jun 24;8(6):5515-26 [impact factor =13.025; citations =52]

Sykes EA, **Albanese A**, Chan WC. BIOPHOTONICS: Implantable waveguides (News & Views), Nature Photonics 2013 [impact factor = 27.254]

Albanese A*, Lam AK*, Sykes EA, Rocheleau JV, Chan WC. Tumor-on-a-chip provides an optical window into nanoparticle transport, Nature Communications, 2013 Nov 1; 4:2718 [impact factor = 10.015; citations = 41]

Albanese A, Tsoi KM, Chan WC. Simultaneous quantification of cells and nanomaterials by inductive-coupled plasma techniques. J Lab Autom. 2013 Feb;18(1):99-104. [impact factor =1.457; citations = 9]

Albanese A, Tang PS, Chan WC. The effect of nanoparticle size, shape, and surface chemistry on biological systems. Annu Rev Biomed Eng. 2012;14:1-16. [impact factor =10.946; citations =756; > 19,500 downloads]

Albanese A, Chan WC. Effect of gold nanoparticle aggregation on cell uptake and toxicity. ACS Nano. 2011 Jul 26;5(7):5478-89. [impact factor =12.062; citations =252]

Albanese A, Sykes EA, Chan WC. Rough around the edges: the inflammatory response of microglial cells to spiky nanoparticles. ACS Nano. 2010 May 25;4(5):2490-3. [impact factor =12.062; citations =30]

Sgouroudis E, **Albanese A**, Piccirillo CA.Impact of protective IL-2 allelic variants on CD4+ Foxp3+ regulatory T cell function in situ and resistance to autoimmune diabetes in NOD mice. J Immunol. 2008 Nov 1;181(9):6283-92. [impact factor =5.520; citations =57]

Tritt M, Sgouroudis E, d'Hennezel E, **Albanese A**, Piccirillo CA. Functional waning of naturally-occurring CD4+ regulatory T cells contributes to the onset of autoimmune diabetes. Diabetes. 2008 Jan;57(1):113-23 [impact factor =7.895; citations =150]

Piccirillo CA, Tritt M, Sgouroudis E, **Albanese A**, Pyzik M, Hay V. Control of type 1 autoimmune diabetes by naturally occurring CD4+CD25+ regulatory T lymphocytes in neonatal NOD mice. Ann N Y Acad Sci. 2005 Jun;1051:72-87. [impact factor =4.375; citations =62]

Selected Online Projects

GLiMPSE Podcast (MIT): http://glimpse.mit.edu/

Koch Institute Image Awards 2016 Interview: <u>https://www.youtube.com/watch?v= jLHGkKLukg</u> BiopSys Network 2014 Interviews: <u>https://www.youtube.com/watch?v=IZwXZZYoiOo</u> Focal Point Podcast (Univ. of Toronto): <u>http://podcast.ibbme.utoronto.ca/focalpoint/</u>

Presentation and Meetings

Three Minute Thesis 2013 (3MT), University of Toronto

- University of Toronto finalist
- Tumor-on-a-Chip: Screening Nanoparticles to Cure Cancer (Albanese A, Lam AK, Rocheleau JV, Chan WC.)

BMES 2012 Annual Meeting, Atlanta, GA

- oral presentation (peer reviewed)
- Effect of Active Targeting and Microfluidic Flow Rate on Nanoparticle Distribution in a Cell Spheroid. (Albanese A, Lam AK, Rocheleau JV, Chan WC.)

IBBME Scientific Day 2011, University of Toronto

- oral presentation (peer reviewed)
- The Effect of Gold Nanoparticle Aggregation on Cell Uptake and Toxicity (Albanese A & Chan WC.)
- Annual event organized by IBBME department

BMES 2010 Annual Meeting, Austin, TX

- Poster (peer reviewed)
- Synthesis of size-tunable protein-gold nanoparticle aggregates (Albanese A, Chan WC)

BiopSys All-Network Meetings (#2-8) 2008-2012, University of Toronto

- Poster (twice per year)
- Oral presentation in 2011
- NSERC Strategic Network for Bioplasmonic Systems

Awards

SMASH Fellowship, International Award, 2016 CIHR Postdoctoral Fellowship Award, National Award, 2015-2017 Koch Institute Image Competition 2016, Institutional award, 2016 Ping Grant from MIT-PDA, Institutional award, 2015 NSERC Postdoctoral Fellowship Award, National Award, 2014-2016 Ontario Graduate Scholarship, Provincial Award, 2012-2013 SGS Conference Grant, Institutional Award (U of T), 2012 Ontario Graduate Scholarship, Provincial Award 2011-2012 Award for Best "Lightning Round Presentation (12 min)", Departmental Award, 2011 Ontario Graduate Scholarship, Provincial Award 2010-2011 St. George's Society Graduate Scholarship, Institutional Award (U of T) 2010 Ontario Graduate Scholarship, Provincial Award 2009-2010 Milligan Graduate Fellowship, Institutional Award (U of T) 2008 McGill Graduate Studies Award, Institutional Award 2005 McGill University Health Centre Award, Institutional Award 2005 F.C Harrisson Institutional Award, (McGill) 2004