Sarah Johnson

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EDUCATION

Imperial College London,
- Ph.D. in Bioengineering — Oct 2014 – Mar 2019
- M.Res. in Bioengineering, (Merit) — Oct 2013 – Sep 2014

University of Leicester,
- B.Sc.(Hons) in Biological Sciences, Cell physiology 2:1 (68.4%) — Sep 2010 – Jun 2013

Alleynes High School and 6th Form Centre,
- A Levels Maths, Chemistry, Biology, General Studies, Physics, (AAAAB) — Sep 2007 – Jun 2009
- GCSEs, (11 A*s) — Sep 2005 – Jun 2007

RESEARCH EXPERIENCE

Stanford University, California
- Post-doctoral researcher within the Digital Athlete Program under Prof Scott Delp. Oct 2021 – present
  - Using data from wearable to improve athletic performance, focusing on injury prevention and female health
  - Development of online platform integrating training data sharing prompted labelling and health surveys
  - Investigating the impact of the menstrual cycle on endurance associated metrics and the interaction with contraception
  - Developing bio mechanically-informed loading metrics and identifying injury risk patterns in data from runners

The Alan Turing Institute Data Study Group, London
- Using machine-learning to improve vascular perfusion quantification in the critically ill. Sep 2021

Dynamic Metrics, Hertfordshire
- Research within medical device start-up working on GaitSmart ™ Jul 2019 – Aug 2021
  - Biomechanical modelling in OpenSim and data analysis in Python.
  - Database manipulation (MongoDb) and AWS command line use.
  - Software development (C++) to predict ground force reaction during gait measured with inertial measurement units.
  - Applying machine learning techniques (classification) to modelled patient gait to inform personalised rehabilitation.
  - Web design www.dynamicmetrics.com
- Internship as a researcher at Dynamic Metrics Jan 2019 – Jul 2019

Imperial College London, London
- PhD Project: Modelling the effect of lymph node swelling on T cell response. Oct 2014 – Jul 2019
  - Agent based modelling of T-cell response to antigen while varying lymph node swelling.
  - Implemented in Java, simulated using High Performance Computing, data analysis in Matlab.
  - Global sensitivity analysis with Latin hypercube sampling and calculation of Partial Rank Correlation Coefficients.
- PhD Project: Analysing inflammatory and miRNA expression changes in human lymphatic vessels associated with relapse in ovarian cancer patients. Sep 2015 – Jul 2019
  - Isolation of micro-scale vessels and processing for RNA isolation or imaging.
  - Production of cDNA and subsequent real-time qPCR using 94 well plates.
  - Quantification of vessel inflammatory state and cancer-infiltration using immunohistochemical staining and imaging.
  - Analysis of miRNA expression data, imaging results and clinical patient data.
  - First author on an international collaboration with Texas A & M and Imperial College Healthcare NHS trust.
- Masters Project: Cell transport in murine lymph nodes using agent based models Sep 2013 – Sep 2014
  - Assessed Modules: Computational Methods for Bioengineers, Statistics and Data Analysis
  - Further Modules: Biomechanics, Computational Neuroscience, Techniques in Bioengineering.

University of Leicester, Leicester
- Summer Internship: Investigating the effect of ‘NGEF’ gene over-expression and RNAi silencing on neurodegeneration in Huntington gene-expressing cells Jun 2013 – Sep 2013
- Undergraduate Project:’Identifying gene targets in Huntington’s Disease using bioinformatic techniques to analyse data from model organisms and patients’ Jan 2013 – Jun 2013

AWARDS AND HONOURS

- The Wu Tsai Human Performance Symposium 2023. Most innovative short talk. Stanford Mar 2023
- The Alan Turing Institute Sep 2021 Data Study Group: Drive Approach Award. London Sep 2021
- Lymphatic Education Research Network (LE&RN) Best Scientific Early Stage Researcher Poster Award. Lymphatics Forum. Chicago. May 2017

- LE&RN Travel Award: NIH conference 'Lymphatics as Regulators...'. Washington DC. Sep 2015
- Athletics Sports Scholar on the Developing Excellence Scheme at Imperial College London Sep 2016
- British Universities Championships 10000m Silver Medallist. May 2015
- Website Design, 2nd place, CodeFirst:Girls Html & CSS course at Imperial College London
  - https://johnsara04.github.io Nov 2017
- The Anglo-Austrian Society Otto Harpner Award to fund German language course Aug 2016
- 1st Year Academic Scholarship at the University of Leicester. Oct 2012
- British U20 5000m England Athletics Gold Medallist. Jul 2011

PRESENTATIONS AND PUBLICATIONS

- O'Day, J.*, Gonzalez, A.*, Johnson, S., Kim, J., Jasinski, S., Holmes, K., Hicks, J., Delp, S. 2024, July. Characterization of cyclic physiology throughout the menstrual cycle and lifespan. Oral presentation at Frontiers of Human Performance Meeting, Jackson Hole, WY, US.
- Johnson S., Shetty M., Gonzalez A., O'Day J., Kuhl,E., Hicks,J., Delp S. Using smartwatch data to reduce injury and quantify menstrual cycle effects to improve performance. Wu Tsai Human Performance Symposium. Stanford 2023
- Johnson S , Chakraborty S, Drosou A, Cunnea P, Tzovara D, Nixon K, Zawieja D C, Muthuchamy M, Fotopoulou C and Moore J E Jr. Inflammatory state of lymphatic vessels and miRNA 2 profiles associated with relapse in ovarian cancer patients. 2020. PLOS ONE. doi.org/10.1371/journal.pone.0230092
- Johnson S, Frattolin J, Edgar LT, Jafarnejad M , Moore JE Jr. Lymph node swelling combined with temporary effector T cell retention aids T cell response in a model of adaptive immunity.2021 Royal Society Interface. royalsocietypublishing.org/doi/10.1098/rsif.2021.0464
- Yufeng Shou*, Sarah C Johnson*, Ying J Quek, Xianlei Li, Andy Tay. Integrative lymph node-mimicking models created with biomaterials and computational tools to study the immune system. 2022. Materials Today Bio.*(joint). doi.org/10.1016/j.mtbio.2022.100269
- Johnson S, Edgar L, Watson D, Moore J. Hybrid agent-based/Transport modeling of immune cell interactions in lymph nodes. CMBBE. July 2019, New York, USA (Abstract)
- Johnson S, Edgar LT, Moore JE Jr. Modelling the effects of Lymph Node hypertrophy on T cell transit and interactions during the cell mediated response. BioMedEng2018. Sep 2018. London, UK.(Poster)
- Johnson S, Edgar L T, Moore J E Jr. Computational modelling of immune cell trafficking during inflammatory lymph node expansion. Lymphatics Forum May 2017, Chicago, IL, USA. (Poster).
- Johnson S, Moore J E Jr. MEIbioeng Sep 2016. University of Oxford. UK. Agent Based modelling suggest lymph node enlargements aids T cell activation. (Poster)

WORK AND RESPONSIBILITIES

Stanford University, California

- SSG Mentor for community college students aiming to close the gap in science training & opportunity Sep 2023
- Organizer of the All-Hands Meeting, Inaugural Wu Tsai Human Performance Symposium Mar 2023

Imperial College London, London

- Sub-Warden at Beit Hall Sep 2015 – Aug 2016
  - Pastoral care, budgeting and event planning in a hall of 400 students
- Global Innovation & Management Ambassador Aug 2014 – Aug 2017
  - Annually organising cultural insight and team events for visiting Chinese students.
- Women's Captain of Cross Country and Athletics Sep 2015 – Aug 2016
- Imperial Festival Volunteer - science communication May 2014 – May 2014

Riverview Residential Home, Health Centre assistant. Barlaston Jan 2009 – May 2010

Centre de Salut, Health Centre assistant.Salango, Ecuador Aug 2009 – Oct 2009

Oulton Abbey Care Home, Orderly. Oulton, Staffordshire Oct 2008 – Mar 2010

OTHER

German B2 Imperial College London Horizons Program Jun 2018

Imperial College High Performance Computing School Summer 2016 Sep 2016

Linux/Unix at the Centre for Continued Professional Development Imperial College London Nov 2015

Grade 7 Violin and Grade 6 Classical Guitar Mar 2009

REFERENCES

- **Professor James E Moore Jr** , The Bagrit & RAEng Chair in Medical Device Design
  Department of Bioengineering, Imperial College London, SW7 2AZ, UK
  james.moore.jr@imperial.ac.uk • +44 (0)20 7594 9795
- **Professor Ruth Luthi-Carter** , Chair of Neurobiology of Behaviour
  MSB, University of Leicester, Leicester, LE1 7RH, UK
  relc3@le.ac.uk • +44 0116 252 2925