

Anthony John Roberts

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CAREER AND EDUCATION

- 2019 – present: **Wellcome Trust Senior Research Fellow & Senior Lecturer** (proleptic appointment) Institute of Structural Molecular Biology (ISMB), Birkbeck/UCL, London, UK.
- 2014 – 2019: **Sir Henry Dale Fellow** Institute of Structural Molecular Biology (ISMB), Birkbeck/UCL, London, UK.
- 2010 – 2014: **Sir Henry Wellcome Fellow** with Professor Samara Reck-Peterson, Harvard Medical School, Boston, USA.
Sponsors: Professor Peter Knight & Dr Stan Burgess, University of Leeds, UK.
- 2005 – 2009: **Wellcome Trust PhD student** with Professor Peter Knight & Dr Stan Burgess, University of Leeds, UK.
- 2002 – 2005: **First Class Honours in Biochemistry** (BSc)
Imperial College, London, UK.

HONOURS AND AWARDS

- 2018: Election to EMBO Young Investigator Programme.
- 2016: Biochemical Society Early Career Research Award: Molecular Structure and Function.
- 2016: eLife Early-Career Reviewer.
- 2014: Prize for outstanding talk, Harvard Medical School Cell Biology Retreat.
- 2009: Prize for joint best talk, Astbury Centre 3rd year Postgraduate Symposium.
- 2008: Prize for best talk, White Rose 'Molecular Machines' Protein Forum.
- 2008: Prize for best talk, Astbury Centre 2nd year Postgraduate Symposium.
- 2007: Prize for best poster, FBS Postgraduate Symposium, University of Leeds.

PROFESSIONAL ACTIVITIES AND TEACHING

Invited peer reviewer for:

- Nature, PNAS, Nature Communications, eLIFE, Molecular Biology of the Cell, Journal of Molecular Biology, Journal of Structural Biology

Editorial board member for: Cytoskeleton

PhD thesis examiner for:

- Tanja Consolati (Francis Crick Institute), Adrian Hodel (UCL), Anneri Sanger (King's College London), Oliver Martin (Birkbeck), Lisa Redlingshoefer (UCL), Nida Siddiqui (University of Warwick),

PhD supervision for:

- Stephanie Webb (primary), Joe Beton (secondary), Tom Foran (secondary), Lenka Stejskal (rotation project), Shomon Miah (rotation project), Gwenny Cackett (rotation project), Aisha Ben-Younis (rotation project)

Lectures and workshops:

- Advanced Cell Biology (BCBC006S6), Birkbeck Biomedicine BSc
- Mechanisms of Molecular Machines (BIOC0014), UCL Biochemistry BSc
- Single molecule methods, Principles & Practice in Structural Biology MRes/PhD course
- Dynein Motor Proteins, Wellcome Trust 4-year Interdisciplinary PhD Programme
- Workshop on Careers in Science, Social Mobility Foundation
- Workshop on Applying for Fellowships, Birkbeck Athena Swan Postdoc Working Group

Committees and academic service:

- Birkbeck Biological Sciences Graduate Committee
- ISMB Retreat Organizing Committee, 2015, 2017, 2019
- Scientific Advisory Board, University of Leeds Wellcome Trust 4-year PhD Programme

RESEARCH SUPPORT

- 1) Wellcome Trust Senior Research Fellowship, Grant holder: Anthony Roberts, Title: Multi-scale mechanisms of microtubule-based transport within cilia/flagella, Role: PI, 29/11/2019 – 28/11/2024
- 2) EMBO Young Investigator Award, Grant holder: Anthony Roberts, Title: Building the cilium with ATP-driven molecular motors, Role: PI, 01/01/2019 - 31/12/2022
- 3) Royal Society Research Grant, Grant holder: Anthony Roberts, Title: Uncovering the Dynamics of Molecular Motors Driving Cilium Construction in Living Cells, Role: PI, 15/03/2018 - 14/03/2019
- 4) BBSRC New Investigator Award, Grant holder: Anthony Roberts, Title: Dissecting the molecular mechanism of intraflagellar transport motors, Role: PI, 1/4/2017 – 31/3/2020
- 5) Wellcome Trust and Royal Society Sir Henry Dale Fellowship, Grant holder: Anthony Roberts, Title: Mechanisms and Decisions in Microtubule-based Intracellular Transport, Role: PI, 01/11/2014 - 31/10/2019
- 6) Wellcome Trust Sir Henry Wellcome Postdoctoral Fellowship, Grant holder: Anthony Roberts, Title: Mechanisms regulating movement and force generation by cytoplasmic dynein, Role: Sir Henry Wellcome Fellow, 01/08/2010 - 31/07/2014
- 7) BBSRC Project Grant, Grant holder: Prof David Stephens, Title: Dynein-2: Building and maintaining a functional primary cilium, Role: Co-PI, 1/2/2019 – 31/01/2023
- 8) Wellcome Trust Multi-User Equipment Grant, Grant holder: Prof Roland Fleck, Title: Cryo focussed ion beam scanning electron microscope for correlative functional studies of biological systems in situ by tomography, Role: Co-applicant, 16/9/2018 – 15/9/2023
- 9) Wellcome Trust Multi-User Equipment Grant, Grant holder: Prof Helen Saibil, Title: State of the art cryo electron microscope for molecular and cellular biology, Role: Co-applicant, 01/03/17 - 01/03/2022

SELECTED AND UPCOMING TALKS

Aug 2019: Cilia FASEB meeting, Colorado, USA
Dec 2018: American Society for Cell Biology Annual Meeting, USA
Oct 2018: Cilia 2018 EMBO Workshop, Copenhagen, Denmark
Nov 2017: Dynein International Workshop, Awaji Island, Japan
April 2017: British Society for Cell Biology Annual Meeting, Warwick
Jul 2016: Institute of Molecular Oncology, Milan
Jan 2016: Centre for Mechanochemical Cell Biology, University of Warwick
Jun 2015: Division of Cell & Molecular Biophysics, King's College London
Apr 2015: London Structural Biology Club, London
Mar 2015: British Microtubule Meeting, Edinburgh
Feb 2014: Biophysical Society 58th Annual Meeting, San Francisco
Jul 2013: Division of Structural Studies, MRC-LMB, Cambridge

LIST OF PUBLICATIONS

(*Corresponding author)

(†Co-first author)

Toropova K, Zalyte R, Mukhopadhyay AG, Mladenov M, Carter AP, **Roberts AJ***.
Structure of the dynein-2 complex and its assembly with intraflagellar transport trains.
Nature Structural & Molecular Biology (2019) 26(9):823-829.
Research highlight in Science (365: 1132).
Feature by Susan Dutcher (NSMB 26).

Roberts AJ*, Toropova K, Imai H.
Electron Microscopy Studies of Dynein: From Subdomains to Microtubule-Bound Assemblies.
Handbook of Dynein (Second Edition) (2019) In press.

Roberts AJ*.
Emerging mechanisms of dynein transport in the cytoplasm versus the cilium.
Biochemical Society Transactions (2018) 46(4):967-982.

Toropova K, Mladenov M, **Roberts AJ***.
Intraflagellar transport dynein is autoinhibited by trapping of its mechanical and track-binding elements.
Nature Structural & Molecular Biology (2017) 24(5):461-468.
Feature by Gaia Pigino & Steve King (NSMB 24).

Atherton J, Jiang K, Stangier MM, Luo Y, Hua S, Houben K, van Hooff JJE, Joseph AP, Scarabelli G, Grant BJ, **Roberts AJ**, Topf M, Steinmetz MO, Baldus M*, Moores CA*, Akhmanova A*.
A structural model for microtubule minus-end recognition and protection by CAMSAP proteins.
Nature Structural & Molecular Biology (2017) 24(11):931-943

Curriculum vitae

Toropova K[†], Zou S[†], **Roberts AJ**, Redwine WB, Goodman BS, Reck-Peterson SL, Leschziner A*.

Lis1 regulates dynein by sterically blocking its mechanochemical cycle.
eLIFE (2014) 3:e03372.

Roberts AJ*, Goodman BS, Reck-Peterson SL*.

Reconstitution of dynein transport to the microtubule plus end by kinesin.
eLIFE (2014) 3:e02641.

Tan K, **Roberts AJ**, Chonofsky M, Egan M, Reck-Peterson SL*.

A Screening Method to Identify Intracellular Transport Machinery based on Microscopy and Multiplex Genome Sequencing.

Molecular Biology of the Cell (2014) 25(5):669-78.

Roberts AJ*, Kon T, Knight PJ, Sutoh K, Burgess SA*.

Functions and Mechanics of Dynein Motor Proteins.

Nature Reviews Molecular Cell Biology (2013) 14:713-726.

Huang J[†], **Roberts AJ**[†], Leschziner AE, Reck-Peterson SL*.

Lis1 Acts as a "Clutch" between the ATPase and Microtubule-Binding Domains of the Dynein Motor.

Cell (2012) 150(5):975-86.

Feature by Martina Trokter & Thomas Surrey (Cell 150).

Roberts AJ*, Malkova B, Walker ML, Sakakibara H, Numata N, Kon T, Ohkura R, Edwards TA, Knight PJ, Sutoh K, Oiwa K, Burgess SA*.

ATP-driven Remodeling of the Linker Domain in the Dynein Motor.

Structure (2012) 20(10):1670-80.

Feature by Carolyn Moores (Structure 20).

Roberts AJ, Burgess SA.

Structural Studies on the Dynein Motor Domain.

Handbook of Dynein (2010) Pan Stanford Publishing.

Roberts AJ, Numata N, Walker ML, Kato YS, Malkova B, Kon T, Ohkura R, Arisaka F, Knight PJ, Sutoh K, Burgess SA*.

AAA+ Ring and Linker Swing Mechanism in the Dynein Motor.

Cell 136: 485-95.

Feature by Andrew Carter & Anne Houdusse (Cell 136).

Research highlight (Biopolymers 91).

Roberts AJ, Burgess SA*.

Electron Microscopic Imaging and Analysis of Isolated Dynein Particles.

Methods in Cell Biology (2009) 91:41-61. Editors: Stephen King & Gregory Pazour.

Kon T, Imamula K, **Roberts AJ**, Ohkura R, Knight PJ, Gibbons IR, Burgess SA, Sutoh K*.

Helix Sliding in the Stalk Coiled Coil of Dynein Couples ATPase and Microtubule Binding.

Nature Structural & Molecular Biology (2009) 16: 325-33.