



**how to**  
complete a PhD  
in the medical  
and clinical  
sciences

EDITED BY  
ASHTON BARNETT-VANES AND  
RACHEL ALLEN

WILEY Blackwell



# **How to Complete a PhD in the Medical and Clinical Sciences**



# How to Complete a PhD in the Medical and Clinical Sciences

**Edited by**

**Ashton Barnett-Vanes**

St George's, University of London and Imperial College London, UK

**Rachel Allen**

Reader in Immunology of Infection and Head of Graduate School

St George's, University of London, UK

**WILEY** Blackwell

This edition first published 2018  
© 2018 by John Wiley & Sons Ltd

*Registered Office*

John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

*Editorial Offices*

9600 Garsington Road, Oxford, OX4 2DQ, UK

The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK.

111 River Street, Hoboken, NJ 07030-5774, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at [www.wiley.com/wiley-blackwell](http://www.wiley.com/wiley-blackwell)

The right of Ashton Barnett-Vanes and Rachel Allen to be identified as the authors of the editorial material in this work has been asserted in accordance with the UK Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by the UK Copyright, Designs and Patents Act 1988, without the prior permission of the publisher.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book. It is sold on the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

The contents of this work are intended to further general scientific research, understanding, and discussion only and are not intended and should not be relied upon as recommending or promoting a specific method, diagnosis, or treatment by health science practitioners for any particular patient. The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of fitness for a particular purpose. In view of ongoing research, equipment modifications, changes in governmental regulations, and the constant flow of information relating to the use of medicines, equipment, and devices, the reader is urged to review and evaluate the information provided in the package insert or instructions for each medicine, equipment, or device for, among other things, any changes in the instructions or indication of usage and for added warnings and precautions. Readers should consult with a specialist where appropriate. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read. No warranty may be created or extended by any promotional statements for this work. Neither the publisher nor the author shall be liable for any damages arising herefrom.

*Library of Congress Cataloging-in-Publication data applied for*

ISBN: 9781119189602

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Cover Design: Wiley

Cover Image: © Meaden Creative

Set in 9.5/12pt Minion by SPi Global, Pondicherry, India

10 9 8 7 6 5 4 3 2 1

# Contents

List of contributors, xi

About the editors, xv

Foreword, xvii

Preface, xix

Acknowledgements, xxi

## **Chapter 1: Introduction, 1**

*Ashton Barnett-Vanes and Rachel Allen*

A PhD, 1

Perspective, 2

Why a book? How to use it, 5

References, 6

## **Chapter 2: Deciding on and finding a PhD, 7**

*Jonathan C.H. Lau and Ming He*

Background, 7

Routes of entry, 8

How to find one, 11

Choosing a project, 13

Making an application, 16

Interviews, 17

How to fund one, 18

Reference, 22

Further reading, 22

**Chapter 3: Anatomy of a PhD: Where you fit in the academic world, 23**

*Laura Lambert and John Tregoning*

Background: Welcome to the new you, 23

You are here: PhD research versus undergraduate studies, 24

Lab types: A field guide, 25

It's tricky: The student-supervisor interaction, 27

Check out my massive organogram, 28

Other dull, but important stuff, 29

Conclusion, 31

Reference, 32

**Chapter 4: Core techniques, principles and statistics, 33**

*Andrew John Walley, Kyrillos N Adesina-Georgiadis, Adel Benlahrech and Fiona Reid*

Genomics, 33

Metabolomics, 38

Flow cytometry, 40

Statistics, 45

References, 49

Further reading, 49

**Chapter 5: Take off: Year 1, 51**

*Ashton Barnett-Vanes and Rachel Allen*

Background, 51

Understanding your team and project, 52

The literature, 53

The research proposal, 55

Starting experiments, 56

Data management and record keeping, 57

The 'transfer', 58

Conclusion, 59

Common pitfalls, 59



**Chapter 6: Dealing with problems, 63**

*Rachel Allen and David Salman*

- Background, 63
- General problems, 64
- Academic problems, 66
- Common PhD problems, 69
- Conclusions, 72
- References, 73
- Further reading, 73

**Chapter 7: Breaking ground: Year 2, 75**

*Ashton Barnett-Vanes and Rebecca Ingram*

- Background, 75
- Taking ownership of your project, 75
- Shaping the research direction, 76
- From preliminary to publishable data, 77
- Supervising junior students, 79
- The end of Year 2 review/assessment, 80
- Conclusion, 82
- Common pitfalls, 82

**Chapter 8: Presenting and publishing as a PhD student, 85**

*Ashton Barnett-Vanes and Henry D.I. De'Ath*

- Background, 85
- Presentations, 85
- How to present, 87
- Publications, 89
- Writing an original research article, 90
- Writing a review article, 93
- Narrative reviews, 95
- Final steps, 95
- Managing the process, 96

viii **Contents**

Other considerations, 98

Conclusion, 98

References, 98

Further reading, 98

**Chapter 9: Landing and writing up: Year 3, 99**

*Manu Chhabra and E. Allison Green*

Background, 99

An exit strategy, 99

The X Factor results, 100

Before you start writing, 101

Writing your thesis: Part 1, 102

Writing your thesis: Part 2, 105

Conclusion, 111

Common pitfalls, 111

Further reading, 112

**Chapter 10: The viva and moving on, 113**

*Rachel Allen and Kate Gowers*

Background, 113

An examiner's perspective (Rachel), 113

The viva, 115

Corrections, 117

Career routes, 119

Conclusion, 123

Further reading, 123

**Chapter 11: PhDs in veterinary science and medicine, 125**

*Fiona Cunningham, Jonathan Elliott, Fiona Tomley and Kristien Verheyen*

Background, 125

Is it for me?, 126

Your project, 128

Presenting and publishing your findings, 130

Post-PhD, what's next for me?, 131

Conclusion, 133

Possible concerns, 133  
Acknowledgements, 134  
Reference, 134

**Chapter 12: International perspectives on medical and clinical science PhDs, 135**

*Célia A. Soares and Paul Langford*

Background, 135  
Choosing a country, 135  
Finding a department, 136  
‘Full’ PhDs versus ‘dual-PhDs’, 137  
Interviewing in a lab abroad, 139  
Funding, 140  
Administrative issues, 140  
Conclusion, 143  
Common pitfalls, 143  
Further reading, 144

**Chapter 13: What I’m really thinking: The post-doc, 145**

*Adel Benlahrech*

Background, 145  
It is great to be a post-doc!, 145  
Is it really that great?, 146  
A post-doc’s advice, 146  
Conclusion, 149  
Further reading, 149

**Chapter 14: What I’m really thinking: The Professor, 151**

*Michael Dustin*

Index, 153



# List of contributors

**Kyrillos N Adesina-Georgiadis DIC PhD**

Honorary Research Associate  
Imperial College London  
UK

**Rachel Allen DPhil**

Reader in Immunology of Infection and Head of Graduate School  
St George's, University of London  
UK

**Ashton Barnett-Vanes BSc PhD**

MB-PhD Candidate  
St George's, University of London and Imperial College London  
UK

**Adel Benlahrech PhD**

Post-doctoral researcher  
University of Oxford  
UK

**Manu Chhabra MBBChir PhD**

Doctor  
National University Hospital, Singapore and University of Cambridge  
Singapore, UK

**Timothy M Cox FMedSci**

Emeritus Professor of Medicine and Director of Research  
University of Cambridge  
UK

**Fiona Cunningham BSc PhD**

Professor of Pharmacology  
Royal Veterinary College  
UK

xii **List of contributors**

**Henry D.I. De'Ath PhD MRCS**

Surgical Registrar and Honorary Clinical Lecturer  
Wessex Deanery and Queen Mary, University of London  
UK

**Michael Dustin PhD**

Professor of Immunology  
University of Oxford  
UK

**Jonathan Elliott PhD MRCVS**

Professor of Veterinary Clinical Pharmacology and  
Vice Principal for Research and Innovation  
Royal Veterinary College  
UK

**Kate Gowers PhD**

Research Associate  
University College London  
UK

**E. Allison Green BSc PhD FHEA**

Senior Lecturer  
University of York  
UK

**Ming He MBBS MRCS PhD**

Surgical Research Fellow  
Imperial College London and King's College Hospital  
UK

**Rebecca Ingram PhD PGCHET**

Lecturer  
Queen's University Belfast  
UK

**Laura Lambert MA PhD**

Post-doctoral researcher  
Imperial College London  
UK

**Paul Langford BSc PhD**

Professor of Paediatric Infectious Diseases  
Imperial College London  
UK

**Jonathan C.H. Lau BSc MSc**

MB-PhD Candidate

University of Cambridge and University College London

UK

**Fiona Reid BSc MSc**

Senior Lecturer in Statistics

King's College London and St George's, University of London

UK

**David Salman MBBS MCRP**

Wellcome Trust Clinical Research Training Fellow

Imperial College London

UK

**Célia A. Soares MD**

MD-PhD Candidate

School of Health Sciences, University of Minho

Portugal

**John Tregoning MA PhD**

Senior Lecturer

Imperial College London

UK

**Fiona Tomley BSc PhD**

Professor of Experimental Parasitology

Royal Veterinary College

UK

**Kristien Verheyen PhD MRCVS**

Senior Lecturer in Clinical Epidemiology and Head of Graduate School

Royal Veterinary College

UK

**Andrew John Walley MA DPhil**

Senior Lecturer in Human Genomics

St George's, University of London

UK





## About the editors

Dr Ashton Barnett-Vanes is an MB-PhD Candidate based in London. He completed his medical and clinical science years at St George's, University of London where he was awarded the William Brown and Devitt-Pendlebury Exhibition. In 2012, he graduated with First Class Honours in his intercalated BSc and in 2015 completed his PhD in War Injuries, both at Imperial College London. In 2016, he was a British Council Scholar at Tsinghua University, Beijing. He is the recipient of a Foulkes Foundation Fellowship. Read more at [www.howtophd.com](http://www.howtophd.com) @HowtoPhD

Dr Rachel Allen is a Reader in Immunology of Infection at St George's, University of London. She obtained her DPhil in Immunology at the Weatherall Institute of Molecular Medicine in Oxford and was awarded a Beit Memorial Fellowship to continue her postdoctoral studies at Cambridge University. In addition to her research activities (including PhD supervision) since joining St George's in 2007, Rachel has acted as Associate Dean for Research Degrees and was appointed Head of the Graduate School in 2014.

