

Starter for 10: a decade of supporting academic Clinical Lecturers

December 2018

The Academy of Medical Sciences

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Foreword

Professor Sir Robert Lechler PMedSci, Academy President



The Academy's central mission is to advance biomedical and health research and its translation into benefits for society. I am delighted to say that there has never been a more exciting time in this endeavour; the rapid pace of advancement in areas such as precision medicine, digital and machine learning and omics, to name but a few, are transforming patient treatment and care.

Fundamental to success in generating and optimising advancements in health is the development and support of talented researchers, including clinical academics, biomedical researchers, dentists and vets. This has always been a key objective of the Academy. Through our policy work we engage with our prestigious Fellowship and a broad range of stakeholders, including aspiring medical researchers, to identify pinch-points along the training and career pathway and work to tackle these through developing innovative and targeted funding schemes. A unique aspect of our work is the additional support we provide aspiring researchers through our mentoring and career development programme.

This report focuses on the Starter Grants for Clinical Lecturers scheme. The scheme supports research-active clinicians, dentists and vets to play a crucial role in pursuing scientific discovery as well as generating evidence for new treatments, alongside the delivery of front-line clinical care. Managing this complex role is challenging and in 2008 the Academy and the Wellcome Trust identified a pressing need to support these cohorts as they further their research and transition to independence. The 10th anniversary of the scheme presents an opportunity to reflect on the impact of the scheme; the findings set out in this report are impressive and a cause to celebrate. Clinical Lecturers awarded a Starter Grant have generated new knowledge, impacted on clinical care and influenced policy change, leveraged significant further funding, disseminated their findings through publications, and a great many have secured promotions to research-active roles. I would like to congratulate them for their many achievements.

I would also like to extend my gratitude to the consortium of funders that have generously supported the scheme: the Wellcome Trust, the Medical Research Council, British Heart Foundation, Versus Arthritis (previously Arthritis Research UK), Diabetes UK, the British Thoracic Society (through the Helen and Andrew Douglas bequest), the Royal College of Physicians (2014-2017) and Prostate Cancer UK (2013-2015).

The Starter Grants for Clinical Lecturers scheme demonstrates the power of the sector working together to make a strategic intervention of relatively modest proportions, which has led to fantastic impact. I look forward to watching the further development of the careers and research portfolios of these inspiring colleagues.

Background

When the Academy of Medical Sciences was formed in 1998, the number of clinical academics was in decline. An underlying problem was the lack of a clear training pathway for people who wanted to be both clinicians and researchers. In 2005, two reports played a key role in changing this; one by Professor Dame Sally Davies DBE FRS FMedSci "[Best research for best health](#)", which established the National Institute for Health Research (NIHR), and a report by Sir Mark Walport FRS FMedSci "[Medically- and dentally-qualified academic staff: Recommendations for training the researchers and educators of the future](#)". Sir Mark's report set out a new comprehensive clinical academic training pipeline, which drew on existing schemes offered by funders and a new set of schemes to interlink with existing schemes and create a continuous, integrated and navigable track. The new money that accompanied the formation of NIHR enabled them to develop and implement the interlinking schemes, such as the Clinical Lectureships.

Clinical Lectureships enable clinicians who have undertaken a PhD to pursue post-doctoral research whilst continuing their clinical specialty training. A Clinical Lecturer post offers personal salary and protected research time, however it does not provide research costs. To address this, in 2008 the Academy partnered with the Wellcome Trust to develop and implement the Starter Grants for Clinical Lecturers scheme. The scheme helps award holders to build and establish their research portfolios and provide the means to generate data to support longer-term fellowships and awards. Award holders receive:

- Funds of up to £30,000 over one or two years.
- Mentorship through the Academy's established mentoring scheme.
- A comprehensive career support programme through the Academy's career development activities, such as the SUSTAIN programme, scientific meetings, and career development events and training. In 2013 the Academy launched the Winter Science Meeting – a meeting designed to bring together Starter Grant holders. This meeting has been a huge success and as a result has now been extended to all Academy awardees.

Unsuccessful applicants to the Starter Grants scheme receive feedback and are allowed to resubmit their application at a future round.

Over the past 10 years, the scheme has evolved and encourages applications from Clinical Lecturers across all medical specialties including dentists, general practitioners and vets. In total, 438 Clinical Lecturers have now been supported through 19 rounds of the scheme, with round 20 underway.

Since the launch of the Starter Grants, a funding consortium has been formed to support the scheme; currently comprising the Wellcome Trust, Medical Research Council, British Heart Foundation, Versus Arthritis (previously Arthritis Research UK), Diabetes UK and the British Thoracic Society (through the Helen and Andrew Douglas bequest), to whom we are grateful for their continued support.

Impact of the scheme

The Starter Grants Selection Panel meets twice yearly and supports on average 45 new Clinical Lecturers each year, awarding over £1.3 million annually. To date, 438 Clinical Lecturers have been awarded over £12.4m through 19 grant rounds. The scheme funds a wide variety of research relevant to human health and supports Clinical Lecturers from a wide range of clinical specialties, which are summarised in Table 1. The geographic distribution of these awards for rounds 1 to 19 are presented in Figure 1.



The Starter Grants scheme has already demonstrated significant impact in the generation of new knowledge and in the retention of clinical researchers within academia, by supporting their development to more senior research-active and independent positions. Since its launch, the scheme has supported Starter Grant holders to leverage over £109.7m¹ in follow-on funding and publish 1706¹ research articles. In addition, 60%¹ of award holders have secured promotions to research-active roles.



Aims of the report

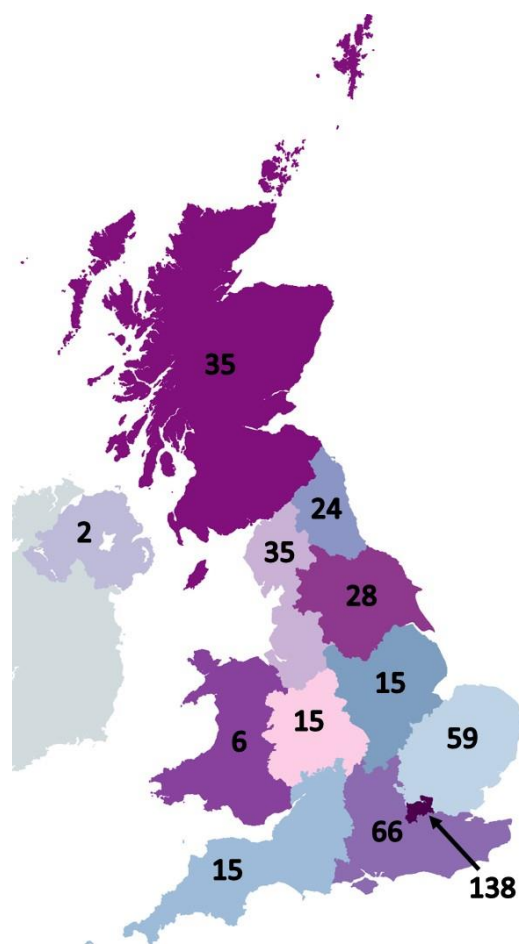
The intention of this report is to mark the 10 year anniversary of the scheme and to celebrate the achievements of its award holders. This is an annual summary report, rather than a scheme evaluation. Specifically, this report will:

1. Summarise new outputs of award holders in terms of research and career progression, as reported to us in the 2018 annual reporting period via Researchfish and occurring within the last year (April 2017-March 2018).
2. Provide a 10-year retrospective of the scheme through narrative case studies drawn from awards made across the past 10 years.

¹ Calculated from data reported to us since the adoption of Researchfish in 2013 and only includes data from rounds 5-17.

Awardee clinical specialty	Reporting in 2017/18	Total awardees
Surgery	32	63
Neurology	23	39
Cardiology	17	38
Oncology	11	31
Psychiatry	12	23
Nephrology	7	21
Infectious diseases	13	19
Obstetrics and gynaecology	11	19
Respiratory medicine	11	18
Paediatrics	8	17
Ophthalmology	8	15
Gastroenterology	6	13
Endocrinology	5	12
Dentistry	6	11
Pathology	3	10
Haematology	3	10
Rheumatology	4	9
Anaesthetics and intensive care	6	9
Urology	2	8
Clinical genetics	5	7
Public health	6	7
Radiology	3	6
Trauma & orthopaedics	4	5
Geriatric medicine	2	5
General practice	1	4
Dermatology	1	4
Clinical pharmacology	2	3
Palliative medicine	3	3
Veterinary medicine	1	2
Immunology	1	2
Hepatology	1	2
Veterinary pathology	1	1
Otolaryngology	1	1
Tropical medicine	1	1
Grand total	221	438

Table 1 – Clinical specialty of Starter Grant holders reporting in the 2017/18 submission window and in total since Round 1 in 2009.



Region	Count of region
London	138
South East	66
East Anglia	59
North West	35
Scotland	35
Yorkshire and Humberside	28
North East	24
South West	15
West Midlands	15
East Midlands	15
Wales	6
Northern Ireland	2

Figure 1 – Geographical distribution of award holders

Research outputs and impact

In this section, we discuss outputs that were reported to us which demonstrate the impact of the scheme in generating new knowledge and enabling the development of our Starter Grant holders. For this, we focus primarily on publications produced, further funding leveraged as a result of this scheme, and career progression. We also look to collaborations formed, reputational standing in their field, prizes and awards, and influences on policy and practice reported to us for further indicators of research quality and esteem.

The Academy adopted Researchfish in 2013 as the sole reporting system for its grant schemes, replacing end of grant reports. Award holders are required to submit data to Researchfish annually throughout the lifetime of their grant and for the year immediately following the close of their award; they are also requested to continue doing so for three years after their award finishes. Researchfish submissions are completed between January and March of each year.

This submission window captured new research outputs produced from April 2017 to March 2018 (referred to as 2017/18 in this report) and these new outputs have been summarised below. In total, 221 grant awardees reported to us for this submission window, these represented 127 live awards and 94 closed awards. Of all the awards still open, 91% complied and submitted a report. As Rounds 18 and 19 were awarded after the 2017/18 submission window, the first reports from these awardees will be made to us in the 2018/19 submission window.

Awardees were asked to report outputs that arose as a result of their Starter Grant award. Because research is a collaborative endeavour, some of the outputs presented here may also have been supported by additional awards.

Publications

New outputs captured in the 2017/18 submission window:

Awardees reported **329** new publications stemming from their Starter Grant award:

- **305** peer reviewed journal articles
- **21** conference proceedings and abstracts
- **2** book chapters

In 2017/18, publications were reported by award holders belonging to 28 of the 34 medical specialties represented in the Researchfish data that year. Many of the journals in which the award holders published highly are dedicated to work of a clinical nature, indicating the translational benefit these funds provide. Award holders specialising in surgery and psychiatry were together responsible for a third of the publications reported in 2017/18 (Table 2) and this reflects the high number of award holders working in those disciplines as detailed in Table 1. The elevated number of publications in certain medical specialties that feature in this ranking, despite having relatively few award holders – for example, geriatric medicine – is due to a number of highly productive individuals.

Clinical specialty	Number of publications	Award holders reporting
Surgery	69	17
Psychiatry	35	8
Infectious diseases	27	9
Neurology	26	10
Cardiology	23	8
Oncology	15	5
Public Health	15	5
Respiratory Medicine	12	7
Paediatrics	11	4
Pathology	10	2
Urology	10	2
Geriatric Medicine	10	1
Obstetrics and Gynaecology	9	5
Clinical Pharmacology	7	2
Dentistry	7	3
Remaining 13 specialties	43	24
Total	329	112

Table 2 – Clinical specialties of the award holders that reported publications in 2017/18.

Publication highlights

Maybin, J. A., Murray, A. A., Saunders, P. T. K., Hirani, N., Carmeliet, P., & Critchley, H. O. D. (2018). Hypoxia and hypoxia inducible factor-1 α are required for normal endometrial repair during menstruation. *Nature Communications*, 9(1), 295. <http://doi.org/10.1038/s41467-017-02375-6>

Gallipoli, P., Giotopoulos, G., Tzelepis, K., Costa, A. S. H., Vohra, S., Medina-Perez, P., ... Huntly, B. J. P. (2018). Glutaminolysis is a metabolic dependency in FLT3^{TID} acute myeloid leukemia unmasked by FLT3 tyrosine kinase inhibition. *Blood*, 131(15), 1639–1653. <http://doi.org/10.1182/blood-2017-12-820035>

Jennings, R. E., Berry, A. A., Gerrard, D. T., Wearne, S. J., Strutt, J., Withey, S., ... Hanley, N. A. (2017). Laser Capture and Deep Sequencing Reveals the Transcriptomic Programmes Regulating the Onset of Pancreas and Liver Differentiation in Human Embryos. *Stem Cell Reports*, 9(5), 1387–1394. <http://doi.org/10.1016/j.stemcr.2017.09.018>

Further funding

New outputs captured in the 2017/18 submission window:

- **£28.7m** of further funding was leveraged by 51 awardees (a total of 71 grants), of which **£19.3m** was in the form of personal fellowships.
- **85%** of further funding awards came from UK-based organisations.
- The majority of funding awards came from the **charity/non-profit** and **public sectors** (44 and 41%, respectively).
- **£365k** of further funding was secured from private/industry sources.
- Starter Grant scheme funders contributed **£13.6m** of the further funding secured by award holders (Figure 2; Table 3).

Most of the further funding secured in 2017/18 comes from research grants and fellowships – together these award categories account for 86% of the further funding reported (Figure 3) and 95.5% of the further funding amount. The majority of the further funding awards were small grants, but Starter Grant holders also succeeded in securing large research grants and fellowships – 30% of the awards had a value exceeding £500k. It should be noted that awardees are asked, in the case of collaborative awards where they are listed as co-investigators, to only report their share of the grant.

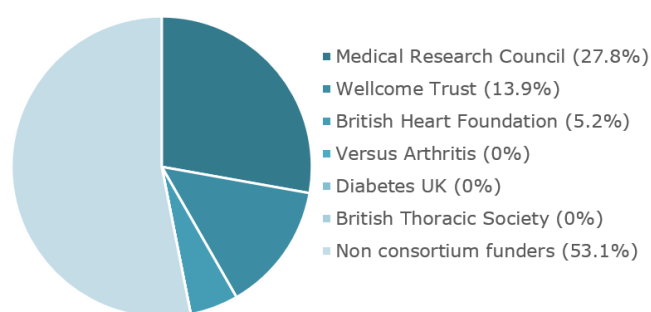


Figure 2 – Starter grants consortium funder contributions to further funding reported in 2017/18

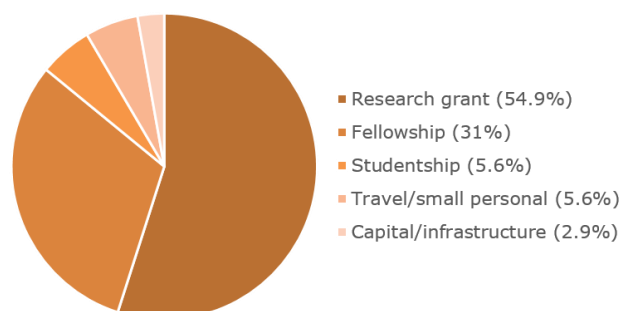


Figure 3 – Nature of the type funding received as reported in 2017/18

Organisation	Sum of award(s)
Medical Research Council	£8,024,025
National Institute for Health Research	£5,115,492
Wellcome Trust	£4,072,704
Cancer Research UK	£2,606,889
European and Developing Countries Clinical Trials Partnership	£1,804,773
British Heart Foundation	£1,519,294
Robertson Foundation	£1,000,000
March of Dimes Foundation	£943,924
Prostate Cancer Foundation	£742,190
Mermaid Care	£365,000
Remaining 40 funders	£2,538,342
Total	£28,732,633

Table 3 – Top ten organisations providing further funding to Starter Grant holders in 2017/18.

Career progression

New outputs captured in the 2017/18 submission window:

Awardees reported securing **22** large personal fellowships (Table 4), of which there were:

- **16** Clinician Scientist Fellowships.
- **6** post-doctoral clinical fellowships.
- In addition to the above personal fellowships, **59** awardees secured other promotions, with 81% of these being research-active roles, e.g. Senior Clinical Lecturer.
- Awardees secured **23** studentships for junior researchers working with them.

Round of SGCL	Funding body and award name
Clinician Scientist Fellowships (or equivalent)	
5	British Heart Foundation Intermediate Clinical Fellowship
8	Medical Research Council Clinician Scientist Fellowship
9	Cancer Research UK Clinician Scientist Fellowship
9	National Institute for Health Research Clinician Scientist Award
10	Medical Research Council, Clinician Scientist Fellowship
11	National Institute for Health Research Clinician Scientist Award
11	Cancer Research UK Clinician Scientist Fellowship
11	British Heart Foundation Intermediate Clinical Fellowship
12	Wellcome Trust Clinical Research Career Development Fellowship
13	MRC-Kidney Research UK Professor David Kerr Clinician Scientist Award
13	Medical Research Council Clinician Scientist Fellowship
13	Wellcome Trust Clinical Research Career Development Fellowship
14	Medical Research Council Clinician Scientist Fellowship
14	Wellcome Trust Clinical Research Career Development Fellowship
15	University of Oxford Big Data Institute Robertson Fellowship
17	National Institute for Health Research Clinician Scientist Award
Senior Postdoctoral Fellowships	
12	National Institute for Health Research Post-Doctoral Fellowship
14	Wellcome Trust Clinical Research Career Development Fellowship
14	Rosetrees James Black UCL Excellence Fellowship
15	Medical Research Council Health Data Research UK Fellowship
15	Wellcome Trust Clinical Research Career Development Fellowship
16	MQ Fellows Award

Table 4 – Personal clinical fellowships secured by award holders in 2017/18.

The above awards take the total number of fellowships reported to us via Researchfish, to date, to 49 Clinician Scientist Fellowships (or equivalent) and 26 senior clinical postdoctoral fellowships. Compared to our previous years' reports, this year has seen an increase in the number of Clinician Scientist Fellowships awarded, with 43% of these awarded to females – an encouraging trend, but also reflective of the increased number of awardees now reporting to us. The number of such fellowships secured by all the Starter Grants awardees is, however, likely to be much higher. Fellowship awards are often secured following the completion of a Starter Grant, meaning data from early rounds will be incomplete. This is because the majority of the awardees from rounds 1-4 of the scheme – whose awards closed prior to our

adoption of Researchfish – have never reported via the system, meaning data collection at 3 years post-award has never been completed for these.

Other outputs

In addition to publications, further funding and promotions, we also collect information on any collaborations forged by our Starter Grants holders, awards and prizes they have received, and any influences they have had on policy and practice. These outputs can serve as indicators of research quality and esteem, and are also of keen interest to us as they align with the Academy's careers policy activities and strategic priority of developing talented researchers.

Collaborations

New outputs captured in the 2017/18 submission window:

Award holders reported **53** new collaborations linked to their Starter Grant;

- **8** of these collaborations were for projects with multiple named collaborators, bringing the total number to **71** new partners.
- Collaborators were primarily UK-based and with partners in the academic sector (Figures 4 and 5).
- 51% of collaborations were reported to include at least one international partner.

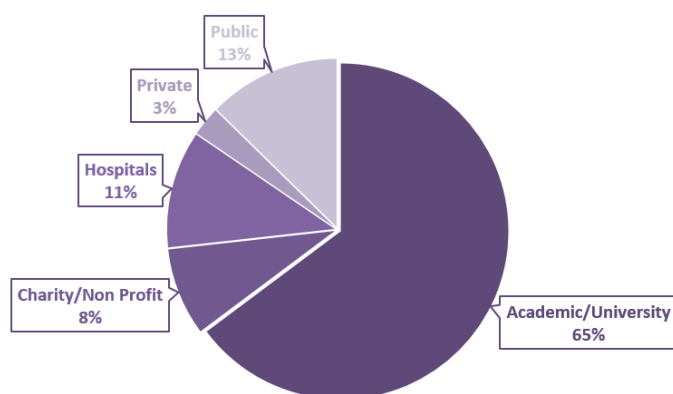


Figure 4 – Sector of newly reported collaborating partners in 2017/18.

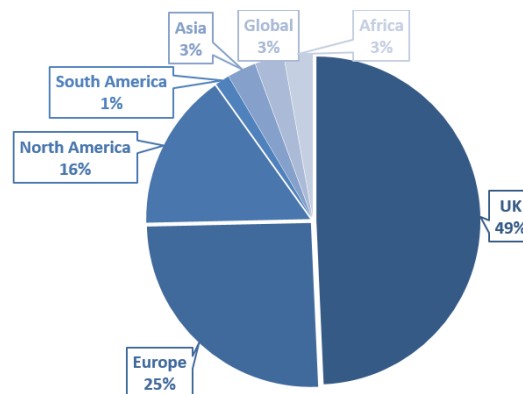


Figure 5 – Location of newly reported collaborating partners in 2017/18.

Influences on policy and practice

New outputs captured in the 2017/18 submission window:

- Starter Grant holders reported **16** new activities influencing policy and practice (Table 5).
- 63% of these influences were at a **national level**, with the remaining at an international level.

Type of influence	Instances
Participation in an advisory committee	5
Membership of a guideline committee	3
Implementation circular/rapid advice/letter to e.g. Ministry of Health	2
Influenced training of practitioners or researchers	2
Participation in a national consultation	2
Citation in clinical guidelines	1
Membership of a guideline committee	1
Total	16

Table 5 – New influences on policy and practice reported in 2017/18

Influence on policy and practice highlight:

Participation in the Royal Society's pairing scheme for researchers and parliamentarians.

"This exchange scheme gives policymakers and research scientists an opportunity to experience each other's worlds. Paired with my local MP at Westminster, I gained an insight into how research findings can help inform policy making and now better understand how I can get involved. During the reciprocal visit, we discussed how reproductive health can impact society, including heavy menstrual bleeding, ectopic pregnancy, stillbirth, premature labour, cancer and infertility. This increased understanding of the impact of reproductive health disorders by policy makers will have a beneficial impact on society."

Jackie Maybin, Round 13

Awards and recognition

New outputs captured in the 2017/18 submission window:

- **40** of the Starter Grant holders reported receiving **64** new awards or other markers of esteem and recognition (Table 6).

Type of award	Instances
Research prize	27
Personally asked as a key note speaker to a conference	18
Appointed as the editor/advisor to a journal or book series	6
Poster/abstract prize	6
Medal	3
Prestigious/honorary/advisory position to an external body	2
Attracted visiting staff or user to your research group	1
Awarded honorary membership, or a fellowship, of a learned society	1
Total	64

Table 6 – New awards and markers of esteem reported in 2017/18

Awards and recognition highlights:

- L'Oreal Women in Science Prize - Beth Psaila, Round 10
- Appointed member of Bowel Cancer UK Scientific Advisory Board - Angus McNair, Round 11
- National Institute of Health Research, Rising Star Award - Golam Khandaker, Round 13
- Invited keynote speaker to the Royal Society of Medicine's Palliative Care Conference 2017 - Amara Nwosu, Round 15

A view of the landscape

Professor Paul Stewart FMedSci, Academy Vice President (Clinical)



In the ten years since the Starter Grants for Clinical Lecturers scheme was created, the UK research landscape has benefited from significant developments. The National Institute for Health Research (NIHR) has been established and celebrated its 10 year anniversary with [a review and refreshed strategy](#) last year. UK Research and Innovation (UKRI) has been formed and encompasses the Research Councils and other organisations. Academic Health Science Networks and a number of 'clusters' have cemented themselves. The ambition for the UK to position itself as a world leader in medical research has been set out in [The Life Sciences Industrial Strategy \(LSIS\)](#) published in 2017. The recommendations include a call for an increased commitment to research and development (R&D) spending, a strengthened environment for

clinical trials, collaboration between industry and the NHS to enable service transformation, and continued improvement on patient outcomes.

The new organisational structures enable greater coordination across stakeholders, including the medical research charities, pharmaceutical, biotech and medtech industries and broader life science sector to realise the ambitions of LSIS. Effective cross-discipline and cross-sector working is essential as researchers tackle increasingly complex research questions. Recent Academy policy reports have defined the impact of emerging healthcare challenges, for example: [Multimorbidity: a priority for global health research](#) and [Health of the public in 2040](#).

As the President highlights in his Foreword, successful advancement of health research requires a sustained pipeline of talented researchers. As Vice President (Clinical) at the Academy, I am committed to ensuring that we work in co-ordination with the broader sector to support aspiring researchers. We achieve this through policy work, for example, the creation of the [UK clinical academic training in medicine and dentistry: principles and obligations](#). This cross-stakeholder document outlines the expectations of the funder, trainee and those responsible for clinical training to ensure that the clinical academic researchers are supported at critical stages and throughout the most difficult transitions in their careers. In addition, the Academy's report '[Improving recognition of team science contributions in biomedical research careers](#)' and recent follow-up conference involved engagement with a broad range of stakeholders to formulate and progress the recommendations on how best to support researchers engaged in collaborative research.

Providing direct support to aspiring medical researchers is also a key component of the Academy's strategy and the Starter Grants for Clinical Lecturers demonstrates our work in this area. To deliver tomorrow's healthcare today we need clinical academics, dentists and vets in all facets of medicine, including primary care and craft disciplines, but also in emerging technologies and practises such as digital medicine and robotics. The Starter Grants scheme will continue to maintain and support diversity amongst award holders.

The last ten years have yielded great progress and the next ten years has the potential to be even more productive. As a sector we must continue to work together to provide both our aspiring and emerging future research leaders with the right training, opportunities and support to enable them to define the new, exciting research priorities and to find solutions through new ways of cross sector working and innovation.

A 10-year retrospective

The Starter Grants for Clinical Lecturers scheme launched in 2008 and has supported 438 Clinical Lecturers through 19 completed awarding rounds. In its 10 years, the scheme has evolved to support a wide range of candidates across the spectrum of medical sciences. In this section, we present a 10-year retrospective of the scheme through narrative case studies drawn from awards made across the 10 years, which demonstrate the impact the scheme has had to the awardees' career development.

The selected award holders were asked to complete a short questionnaire on the research that was supported through their Starter Grant and the impact that the award has had on their career. We have selected case studies to represent the diversity of the Starter Grants portfolio, but these are only a few examples of the impact the Starter Grants have had on their recipients. A longer list of case studies will also be available on our website to mark the occasion.

Case studies were formed from the following awards:

- **Rita Horvath**, Newcastle University (Round 1, 2009)
Identification of new disease genes in combined respiratory chain deficiencies
- **James O'Connor**, University of Manchester (Round 3, 2010)
Can oxygen-enhanced MRI produce biomarkers of tissue hypoxia and prognosis in clear cell renal cancer?
- **Imran Ahmad**, University of Glasgow (Round 6, 2011)
Identification of prostate cancer driver genes by a transposon-based insertional mutagenesis screen in Pten mutant mice
- **Rupert Payne**, University of Bristol (Round 7, 2012)
Evaluating the impact of unsafe prescribing in primary care
- **Katherine Sleeman**, King's College London (Round 10, 2013)
Emergency Department attendance amongst patients with advanced dementia in England, 2013-2014
- **Roger Thompson**, University of Sheffield (Round 11, 2014)
Modulation of host responses to infection by hypoxia
- **Helena Lee**, University of Southampton (Round 14, 2015)
Oral dopamine replacement in the developing albino retina – a proof of concept study
- **George Oikonomou**, University of Liverpool (Round 16, 2016)
Using genomics to prevent lameness-causing foot lesions in dairy cattle
- **Tom Wingfield**, University of Liverpool (Round 17, 2017)
END-TB: enhancing TB control by mitigating catastrophic costs of TB-affected households
- **Ben Jones**, Imperial College London (Round 19, 2018)
Studying the impact of biased GLP-1 receptor signalling in humans

Rita Horvath

Starter Grant awarded in 2009 Newcastle University

Identification of new disease genes in combined respiratory chain deficiencies

Can you give us an overview of your research interests?

I am a neurologist specialising in rare neurogenetic disorders. The focus of my research over the past 20 years has primarily been mitochondrial diseases, but I have also developed a new clinical and research programme in inherited peripheral neuropathies and other rare genetic and metabolic neurological diseases.

I played a key role in the identification of 11 novel disease genes in severe childhood onset conditions and characterised, clinically and biochemically, a large cohort of patients with multiple respiratory chain enzyme deficiency. I identified the cause and molecular mechanism of reversible infantile mitochondrial disease and showed that altered thio-modification of mitochondrial tRNAs may underlie the presentation, suggesting that tRNA modification may be manipulated as a novel target to develop therapies in mitochondrial disease.

What was the impact of your Starter Grant?

My study focussed on the identification of gene defects in children with combined respiratory chain deficiency. With the funding, I successfully established methods of studying mitochondrial translation and coenzyme Q10 metabolism, identified a number of new genes and detected mutations in recently reported disease genes causing a defect of mitochondrial translation or coenzyme Q10 biosynthesis. My research enabled some effective treatments for patients.

The Starter Grant enabled me to start my own laboratory and to optimally combine



clinical and laboratory work, underpinned by successful translational research grant and personal investigator awards.

What are the challenges you face as a clinical academic?

I find that combining clinical commitments and laboratory research is challenging, however being a clinician allows me to better define important research questions with more implications for patients. I find it very appealing that if I identify a potential treatment in the laboratory, as a clinical academic, I could bring it forward to clinical trials.

What's next for you and your research?

After the Starter Grant I was able to develop my research area and expertise in Newcastle, but recently I felt that I needed a new challenge. Therefore, I have now accepted the post of the Director of Research at the University of Cambridge. The extremely high quality of basic science at the Department of Neurosciences and Mitochondrial Biology Unit and the proximity of large national cohorts will help to enrich my research trajectory.

Research highlights

- Professor of Neurogenetics, Newcastle University, in 2013
- Director of Research, University Of Cambridge, in 2018
- Chief Investigator of an international clinical trial.
- Chair of the mitochondrial disease group within the European Reference Network on Rare Neuromuscular Diseases (ERN-NMD)

James O'Connor

Starter Grant awarded 2010 University of Manchester

Can oxygen-enhanced MRI produce biomarkers of tissue hypoxia and prognosis in clear cell renal cancer?

Can you give us an overview of your research interests?

I am a group leader, CRUK clinician scientist and clinical radiologist. My group develops and translates novel imaging methods to evaluate cancer biology and monitor patients with cancer. Particular focus is on MRI methods that measure hypoxia, angiogenesis, cell death or tumour immunology.

In all of these areas, the spatial arrangement of these pathophysiological signals (termed heterogeneity) is believed to be important for determining response to therapy, relapse and subsequent progression. My work also focuses on methods of mapping and quantifying changes in this heterogeneity.

Many imaging methods struggle to be implemented into clinical decision making, so I have pioneered the process by which cancer imaging tests should be validated to become useful tools (O'Connor JPB et al., 2017 Nat Rev Clin Oncol 14: 169-186).

What was the impact of your Starter Grant?

With my Starter Grant, I performed a first in human biological validation study of a novel hypoxia MRI method in patients with renal cancer. This study was completed in 2016 and was published in the leading imaging



journal 'Radiology' earlier this year, providing me with a senior author paper (Little RA et al., 2018 Radiology 288: 739-747). It was also presented orally at two international conferences.

My Starter Grant helped me to obtain a CRUK Clinician Scientist Fellowship in 2013 (£660,000) and a CRUK Advanced Clinician Scientist Fellowship in 2017 (£1.45m)

What's next for you and your research?

I now have a research group of 10 people and am expanding that group into new research areas including artificial intelligence and big data.

Research highlights

- Professor of Radiology, University of Manchester (2018) and co-lead of the newly funded CRUK National Cancer Imaging Network
- Securing £3.6m directly allocated funding to date (CRUK, MRC, EPSRC, other), including getting 2 CRUK Clinician Scientist Fellowships
- A total of 74 publications including to leading cancer journals such as Lancet Oncology, Nature Communications and Cancer Research

Imran Ahmad

Starter Grant awarded 2011 University of Glasgow

Identification of prostate cancer driver genes by a transposon-based insertional mutagenesis screen in Pten mutant mice.

Can you give us an overview of your research interests?

As an Honorary Consultant Urological and Robotic Surgeon based at the Queen Elizabeth University Hospital in Glasgow, I currently perform robotic surgery for localised/locally advanced prostate and bladder cancer. My current research interest is in understanding the mechanisms of treatment-resistance in advanced prostate cancer. Work in my laboratory uses state-of-the-art in vivo models in conjunction with patient samples to interrogate the disease processes in advanced and treatment-resistant prostate cancer. This work will help to provide information on drivers of prostate cancer progression and identify novel biomarkers of disease and/or drug targets to treat the disease.

What was the impact of your Starter Grant?

I was able to use my Starter Grant to continue funding my research during my return to full time higher surgical training post-PhD and to specifically investigate novel oncogenes and tumour suppressor genes that have a role in prostate carcinogenesis. It allowed me to generate the pilot data to apply for my CRUK Clinician Scientist Fellowship. The impact of the Starter Grant on my research career has been immeasurable, without it I could not have continued my experiments post-PhD.



What are the challenges you face as a clinical academic?

The biggest challenges involve time management and that the clinical work takes up a lot of time, often to the detriment of one's research programme. Attending the Academy's Spring Meetings (now CATAC) was invaluable for networking and learning that all clinical academics are in the same boat. When I started as a Consultant and Senior Lecturer I found myself quickly being the sole trained robotic surgeon in the country, at the same time as setting up my lab at the Beatson Institute. As a surgeon, it is impossible to limit clinical work to only one specialist clinic a month, as it is often expected. It needs careful time management and the ability to work within teams.

What's next for you and your research?

I aim to continue producing high quality research whilst balancing a busy tertiary NHS cancer service. I hope to apply for a CRUK Senior Clinical Fellowship over the next few years.

Research highlights

- EAU Prostate Cancer Research Award in 2013
- CRUK Clinician Scientist Fellowship in 2016
- Chairman's Award from NHS Glasgow in 2017

Rupert Payne

Starter Grant awarded 2012 University of Bristol

(University of Cambridge was the original host institution)



Improving the use of medicines in primary care – particularly in polypharmacy.

Can you give us an overview of your research interests?

My research interests lie around the safe and rational use of medicines in primary care; I have a particular interest in polypharmacy – the use of multiple medicines in a single individual.

The use of many medicines is supported by strong scientific evidence. However, medicines can also be used inappropriately, leading to prescribing errors, side effects, patients not taking medicines the way they were intended, an unacceptable burden of treatment for patients, and the effectiveness of medicines not being fully realised. My research is focused on improving the use of medicines to address those concerns. This involves describing the patterns and consequences of inappropriate use of medicines and understanding what factors lead to these problems and why.

What was the impact of your Starter Grant?

My Starter Grant supported an application to use data from a large national database of general practice health care records (the Clinical Practice Research Datalink, CPRD) to examine whether the measures of inappropriate prescribing that are widely used in clinical practice were associated with patient harms. This project examined an important research question for both clinicians and policy makers. The Starter Grant was central in allowing me to develop a broader programme of work using electronic health data and to establish myself as an

expert in this area. This resulted in a number of successful grants and papers, as well as progression to the role of Senior Lecturer.

What skills does a researcher of the future need?

I have found curiosity and a willingness to think “out of the box” are valuable attributes as a researcher, although these need to be tempered by maintaining focus and direction on questions that matter. In addition, most research questions in primary care require a broad multidisciplinary approach, covering everything from epidemiology through to qualitative research, clinical trials through to systematic reviews. Having a high level of expertise in one area is useful but it is essential to be able to work effectively within a wider multidisciplinary team and necessitates good communication and time-management skills.

What’s next for you and your research?

I am currently growing a programme of research at the University of Bristol. This includes leading a £1.9 million clinical trial of an intervention to improve the management of polypharmacy, as well as a number of other studies aiming to improve the safe and effective use of medicines in primary care.

Research highlights

- Promotion to Senior Lecturer at the University of Bristol in 2016
- Developing CRPD research capacity at the University of Cambridge (former institution)

Katherine Sleeman

**Starter Grant awarded 2013
King's College London**



*Emergency department attendance
amongst patients with advanced
dementia in England*

Can you give us an overview of your research interests?

I am interested in the use of routinely collected data – from clinical and administrative systems – to understand and improve end of life care, particularly for people dying with dementia. Over the past decade there has been a very strong policy focus on dying out of hospital as a marker of the quality of end of life care. We, and others, have shown that hospital deaths have fallen over this period, possibly as a result of these policies. But the place of death only tells us about where patients are cared for during their last moments of life, and nothing about the care that they receive in their last weeks and months. Transitions between care settings in the last months of life have been suggested as a better measure of the quality of end of life care. However, very little is known about the frequency with which people make these transitions, or the factors that might help us prevent them.

What was the impact of your Starter Grant?

The aim of my Starter Grant was to investigate Emergency Department attendance among people with dementia in the last year of life. I used data from the South London and Maudsley (SLAM) Biomedical Research Centre, linked to a system called CRIS (Clinical Record Interactive Search) which allows data linkage and deidentification. We identified a cohort of people who had a clinical diagnosis of dementia and who died, and linked to Hospital Episodes Statistics to understand the pattern of Emergency Department visits before death. We found that Emergency Department visits are common among people with dementia, that they increase exponentially in the months before death

and, in contrast to our previous data showing hospital deaths have fallen in recent years, we found that Emergency Department visits are going up over time. This data suggested that policy makers must pay attention to a broad range of indicators of poor end of life care, in addition to the place of death.

My Starter Grant was key in enabling my successful application for a Clinician Scientist Fellowship. It's very valuable to have grants that provide small pots of money, like the Starter Grants. They enable Clinical Lecturers to develop towards independence and even provide grant management knowledge, which I'd not experienced before. It was invaluable.

What's next for you and your research?

I am working with new linked datasets to investigate patterns of care before death, in particular trying to understand the impact of primary care, and social care, on end of life transitions.

Research highlights

- NIHR Clinician Scientist Fellowship in 2016
- Funding from Royal Marsden Partners to explore the impact of primary care and social care on end of life transitions using a novel linked dataset (2018)
- Funding from Alzheimer's Society for a PhD Fellowship to explore Emergency Department attendance among people with advanced dementia (2018)
- Influence on policy – measurement of emergency attendance in the last months of life is now included on the CCG Improvement and Assessment Framework

Roger Thompson

Starter Grant awarded 2014 University of Sheffield

Modulation of host responses to infection by hypoxia

Can you give us an overview of your research interests?

A research expedition to Bolivia investigating how low oxygen levels cause altitude illnesses triggered my interest in research. Training as a respiratory physician, I began asking how low oxygen levels modify human inflammatory responses in the setting of chronic respiratory disease and this became the theme of my work. As my clinical career evolved, I developed a specialist interest in pulmonary vascular disease and transitioned my research work into this area, using my background in pulmonary inflammation and hypoxia to provide new perspectives on diseases such as pulmonary arterial hypertension.

What was the impact of your Starter Grant?

Using the Starter Grant I built on preliminary data obtained during my PhD. These findings, published in *Science Immunology*, highlighted an important interaction between hypoxia and immune responses that could be manipulated to help treat bacterial infection. The grant financed work that led to a second output from my PhD and this combined with support from my institution allowed me to gather pilot data that were used in successful applications for a BHF-Fulbright Scholarship to Stanford and my forthcoming BHF Intermediate Clinical Fellowship.

The biggest impact on my career development has been the mentoring scheme to which I gained access through my Starter Grant. My Academy mentor gave me impartial and candid advice at a crossroads in



my career, encouraging me to pursue the research about which I was most passionate, as well as supporting my applications for fellowships and recommending taking opportunities to travel abroad to develop skills and broaden my research experience.

What skills does a researcher of the future need?

Rather than a particular skill, a researcher needs to have passion for what they are working on and enthusiasm to bring in new ideas. With the continuous development of new technologies and increasing use of big data methodologies, being keen to learn and to collaborate is also vital.

What's next for you and your research?

As hypoxia and inflammation both strongly impact upon vascular responses, I have begun to focus my research work on pulmonary vascular remodelling. This transition aligns my future research with my clinical interest in pulmonary arterial hypertension, a devastating disease that leads to right heart failure and premature death.

Research highlights

- Poster prize at 2016 Annual Association of Physicians meeting
- BHF-Fulbright Scholarship to visit Stanford University in 2017
- Publication of Starter Grant work in *Science Immunology* in 2017
- BHF Intermediate Clinical Fellowship in 2018

Helena Lee

Starter Grant awarded 2015 University of Southampton

Oral dopamine replacement in the developing albino retina – a proof of concept study.

Can you give us an overview of your research interests?

Currently there are no treatments for the eye problems seen in albinism. The average vision in albinism at 20/80 is below UK driving standards, which has implications for school, work and social life. In albinism, a chemical called L-DOPA is missing from the eye and this causes problems with eye development and therefore poor eye sight. However, the eye is still able to change and develop in young children with albinism. Replacing L-DOPA in albinism at a young age may potentially improve eye development and eyesight. My primary research interest is focused on investigating abnormal eye development in albinism and developing new treatments, e.g. L-DOPA, that can change how the eye develops and improve eyesight in children with albinism.

What has the impact of your Starter Grant been so far?

Using the funding provided by my Starter Grant I aimed to determine if early oral L-DOPA replacement in albinism, while the retina is still maturing, can optimise retinal and visual development. I also investigated exactly how L- DOPA deficiency triggers abnormalities of retinal development. The work provided the important preliminary data that demonstrated for the first time that post-natal L-DOPA supplementation can rescue retinal development, morphology and visual function in a murine model of human albinism. This provided the pilot data that supported my successful MRC Clinician



Scientist Fellowship application, which has resulted in my appointment as an Associate Professor and Honorary Consultant Ophthalmologist.

In addition to my Starter Grant, I have participated in a wide range of Academy activities including Spring Meetings (now CATAC), the mentoring scheme and SUSTAIN, an innovative programme enabling female researchers to thrive in their independent research careers. These programmes provided me with many useful skills such as networking, grant writing, surviving rejection/failure, communicating and presenting, planning and organisation, work-life balance, leadership and team building. More importantly, the support and encouragement that I received built my confidence and helped me to cope with many of the difficulties and challenges that have arisen throughout the course of my career.

What's next for you and your research?

Currently my research is focused on: Oral Levodopa treatment in Improving Visual development in Infants and young children with Albinism - the OLIVIA study. Over the next ten years, I plan to expand my research into identifying additional novel therapeutic targets in albinism and other retinal developmental disorders and translating these into clinical practice.

Research highlights

- Fight for Sight Award in 2015
- MRC Clinician Scientist Award in 2018
- Promotion to Associate Professor in 2018

George Oikonomou

Starter Grant awarded 2016 University of Liverpool

Using genomics to prevent lameness-causing foot lesions in dairy cattle.

Can you give us an overview of your research?

I am a Cattle Health Specialist and Senior Lecturer in Livestock Health and Welfare. During my PhD, I investigated the genetics of energy balance and reproduction in Holstein cows. As a Research Associate at Cornell University, I became involved in research projects on dairy cattle lameness, mastitis, and reproductive diseases and was also introduced to the fascinating world of microbiomics. I was a co-investigator in a USDA-funded grant that aimed to study the dynamics of the mammary microbiota during and after intra-mammary infection. I am currently studying dairy cattle lameness using 'omics' approaches.

What has the impact of your Starter Grant been so far?

The proposed project aims to explore the possibility of identifying cattle genes associated with their susceptibility to lameness-causing foot lesions. This study could improve our understanding of lameness-causing lesions while genomic selection of cows for resistance to lameness may be feasible and contribute to the reduction of lesion prevalence. We followed more than 500 animals and recorded any lameness causing lesions in detail. These animals have already been genotyped and we



are now performing genome wide association analyses. Preliminary results are promising and suggest the existence of significant genetic variation in all the studied traits.

Why did you apply for a Starter Grant and what appealed to you about the scheme?

The Starter Grant represented an excellent opportunity for me to generate good quality preliminary data and support a larger grant application which has worked really well.

What's next for you and your research?

My institute has recently recognised the potential of my research career and reduced my teaching time to give me more research time. In collaboration with the Scottish Rural College and the Royal Veterinary College, and funded by BBSRC, I will be conducting a large scale study on the aetiopathogenesis and the genomic architecture of lameness-causing foot lesions.

Research highlights

- Successful BBSRC Responsive Mode grant application in 2018
- Promotion to Senior Lecturer in 2018
- Two presentations at international conferences

Tom Wingfield

Starter Grant awarded 2017 University of Liverpool



END-TB: enhancing TB control by mitigating catastrophic costs of TB-affected households.

Can you give us an overview of your research?

I am an NIHR Academic Clinical Lecturer in Infectious Diseases. I completed medical training in Liverpool and have since worked as an infection physician and researcher in the UK, sub-Saharan Africa, Latin America, and muddy fields at Glastonbury and Reading Festivals.

I am interested in characterising and addressing the social determinants of infectious diseases, with a special focus on tuberculosis (TB). Since 2010, I have worked with the Innovation For Health And Development team in 32 impoverished shantytown communities in north Lima, Peru, to improve equitable TB prevention and control. In addition, I am expanding my research further as a post-doctoral investigator to evaluate the best methods of delivering socioeconomic support to TB-affected households in diverse low-resource settings.

What has the impact of your Starter Grant been so far?

The Starter Grant has already allowed me to grow as an independent researcher, consolidate existing and new collaborations and to become involved in multiple diverse research proposals and studies (including in Mozambique and Vietnam). Specifically, it has helped me to develop a locally-appropriate socioeconomic support package for TB-affected households in Nepal with the IMPACT-TB team. Additional funding from a Wellcome Trust Seed Award has enabled me to implement two studies based on the groundwork done during the AMS Starter Grant.

My Starter Grant has also allowed me to participate in the mentoring scheme and I have been lucky enough to be mentored by a researcher and policy maker who has been an inspiration to me for some years. Our regular meetings have been extremely useful not only with regards to expert advice on research design and methodology but also how to translate research into policy. Moreover, I have found these meetings a constant source of encouragement, especially related to my chosen career path of being an academic clinician with an interest in policy of poverty-related diseases.

What's next for you and your research?

I hope to spend time developing my skills and knowledge of policy and decision-making through time at the World Health Organisation. In the long-term, I aim to continue in clinical and academic medicine, both of which I find interesting and fulfilling. I also hope my work continues to lead to equitable improvements in the health and wellbeing of people, especially those who are vulnerable, under-served and/or from low-income countries.

Research highlights

- Publications in PLOS Medicine (2014) and Lancet Infectious Diseases (2017)
- Co-winning Lancet and Academy of Medical Sciences Young Investigator of the Year Award 2017
- Working with the World Health Organisation as part of their Global Task Force on Catastrophic Costs of TB Patients and the international Social Protection Action Research and Knowledge Sharing (SPARKS) network

Ben Jones

Starter Grant awarded 2018 Imperial College London

Studying the impact of biased GLP-1 receptor signalling in humans

Can you give us an overview of your research?

I am investigating a new approach, known as “biased signalling”, to target cell surface “receptors” in a very specific way to improve the therapeutic potential of drugs and reduce side effects. In comparison to existing drugs, the “biased” molecules I have developed selectively activate processes inside cells linked to beneficial effects and minimise those associated with adverse effects.

I am focussing in particular on the glucagon-like peptide-1 receptor (GLP-1R), an important receptor for control of blood sugar levels and appetite, for which a number of drugs are already available for treatment of diabetes. I have shown that introducing biased signalling into the GLP-1R system increases the blood-glucose lowering effect, whilst minimising nausea (the main side effect of this class of drugs).

What has the impact of your Starter Grant been so far?

My Starter Grant will support a human study testing the effects of biased GLP-1 receptor agonists in humans. This study, termed Receptor Trafficking in Incretin Action (“RETRO”), includes three separate parts to examine the effect of bias on different GLP-1R actions, namely appetite, post-prandial physiology, and pancreatic beta cell function.



The Starter Grant scheme was highlighted to me by senior colleagues soon after I was awarded my Clinical Lectureship. Previous Clinical Lecturers in my department have been recipients of this award and have gone on to achieve further substantial funding. The value of the award, when combined with the initial seed funding I obtained from the Imperial Biomedical Research Centre, will be ideal to allow me to complete the full study and perform comprehensive analyses.

What’s next for you and your research?

I plan to apply the paradigms developed for GLP-1R bias to other receptor systems. This will form the basis for a fellowship application (e.g. Wellcome Career Development Fellowship, stage 1; Diabetes UK Harry Keen Fellowship).

Research highlights

- Publication of previous work in Nature Communications in 2018
- A number of successful funding applications in 2018 (Medical Research Council for £644,312; Engineering and Physical Sciences Research Council for £100,000; Society for Endocrinology for £10,000)

Closing remarks

This year, we celebrate the 20th anniversary of the Academy of Medical Sciences and ten years since the launch of the Starter Grants for Clinical Lecturers scheme. This report has demonstrated, in numbers and narrative, that these awards have had a significant impact on the career development of over 400 Starter Grant holders, which is consistent with the [independent evaluation](#) conducted in 2016 and the original aims of the scheme.

Of particular note is the return on investment, which has shown that awards holders are successful in securing follow-on funding, as for every £1 of Starter Grant funding approximately £9² has been leveraged in further support. Furthermore, Starter Grant holders continue to be awarded senior clinical fellowships, with nearly half being awarded to women, aligning with a key aim of the Starter Grant scheme to facilitate the retention of awardees in research-active roles.

The scheme has developed over time and has benefited from an expanding consortium of funders, which has collectively responded to the evolving landscape and has ensured the scheme remains fit for purpose.

² Calculated from data reported to us since the adoption of Researchfish in 2013 and only includes data from rounds 5-17.



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