

Imperial College London



Research
England

Quantifying and describing the experiences of long-term researchers (LTRs) at Imperial

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POSTDOC AND FELLOWS DEVELOPMENT CENTRE

Tailored support and development for postdocs, fellows and clinicians

Quantifying and describing the experiences of long-term researchers (LTRs) at Imperial

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Timmus Research Ltd

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“My ideal career aspirations would be secure employment as a staff scientist, contributing to the research area of my interest and help driving the field forward towards better health for the world.”

“It's sad, because it would arguably be better for academic science to recognise and reward long-term researchers rather than having a system that continues to penalise teamwork and promotes individualistic behaviours.”



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Terminology

HE: Higher Education

FTC: Fixed term contract

LTR: A long-term researcher who has worked at a postdoctoral level for five or more years

8+LTR: A long-term researcher who has worked at a postdoctoral level for eight or more years

OEC: Open-ended contract

Researcher: A person funded to carry out postdoctoral research on behalf of a Principal Investigator (PI). They are almost always employed having first completed a PhD

PFDC: Postdoc and Fellows Development Centre

PI: Principal Investigator

PTO: Professional, technical or operational contract, given to individuals who work in professional, technical or operational job roles. At Imperial (as in other universities), some researchers are employed on PTO contracts because some of their job activities are considered to fall within the PTO context.

References can be found in the appendix.

1. Executive summary

Of the 1,720 staff who work within the Research job family at Imperial, 370 (22%) are defined as long term researchers (LTRs), having worked at Imperial for five or more years. A total of 207 (12%) had worked at Imperial for eight or more years. Over half of Imperial's LTRs completed our survey. We found that those with seven or fewer years' postdoc experience are predominantly still 'early career' researchers. Those with eight or more years' experience are often fulfilling senior functions: three-quarters of 8+LTRs are supervising students, over half are managing labs or people, and half are teaching.

Survey and interview data reveals 8+LTRs are often stressed by contract precarity and frustrated that their additional knowledge and broader workload goes formally unrecognised. Survey feedback from PIs (incl. 50 Professors) reveals many PIs are also frustrated at being unable to support valued LTRs.

We found that 8+LTR often want to remain within academia and are keen to either:

- Continue as technical experts specialising in research, project and team support. These individuals do not want to become academics. They are often valued by their PI and team. We suggest that Imperial could benefit from the creation of a core-funded, 'staff scientist' role to better recognise and support them.
- Attempt to overcome 'legitimate delays' to progress into the Academic job family. The time taken by these individuals - to have a family, work in industry, and/or move fields - brings maturity, experience and cross-disciplinary knowledge that would benefit Imperial if it could be retained and better harnessed. We suggest creating internal fellowships for 8+LTRs and/or a new, more 'junior' lecturer role.

This report explores the data collected, as well as detailing other ways that Imperial can support long term researchers: through a more substantially equipped PFDC, improved contract data sharing, and by efforts to develop PIs and extend good practice examples within Imperial (notably Engineering's 4+ year career reviews). This report also details the impact of fixed term contracts and precarious employment on the wellbeing of the LTR community, and challenges Imperial to review departmental variation in researcher contract practice and explore the benefits of being more generous in awarding open ended contracts to researchers.

2. Summary

Current practices in Higher Education (HE) mean that employment as a researcher is often precarious and career pathways unclear. Given the instability and stress of their position, it is uncertain what motivates individuals to remain as long-term researchers (LTRs), defined at Imperial as:

A member of staff with at least 5 years' postdoc experience who has a primary responsibility to conduct research and/or oversee or manage research activities, and who is employed on a fixed-term contract, an open-ended contract with limited-term funding, or a non-research specific contract (e.g., in a professional, technical, or operational role)

During this study we aimed to quantify the number of LTRs at Imperial, investigate their motivations, experiences, opinions and attributes. We also aimed to gather feedback from a representative cross-section of the university and PIs to better understand how LTRs are perceived institutionally and describe the motivation to sustain and retain them. Data were collected via a literature review and contact with other research-intensive universities (to better understand the broader context), and anonymous surveys and interviews of researchers and PIs at Imperial. A total of 212 individuals responded to our LTR survey (over 50% of the estimated population of LTRs at Imperial), and 92 individuals responded to our PI survey (50 of whom were Professors). We also individually interviewed 12 LTRs.

Quantifying LTRs

LTRs have not been defined or quantified nationally. Data from the CROS 2017 survey suggest that as many as 58% of UK HE researchers have worked in research roles for five or more years. If correct, this figure would equate to over 28,000 individuals across UK HE, using HESA's figures for 2016-17.

Institutions, where they do collect such data, tend to ask researchers how long they have been present *at that institution* (rather than asking for their full postdoc career length). Data from the literature and from other universities suggests that at least a quarter of the UK's researchers have been working in research posts at that institution for five or more years.

1,720 staff work within the Research job family at Imperial, of whom 370 (22%) have worked at Imperial for five or more years, 207 (12%) for eight or more years, 116 (7%) for 11 or more years, and 73 (4%) for 14 or more years. These individuals may have been postdocs elsewhere before coming to Imperial and so these are minimum figures. We were unable to quantify the number of researchers employed on PTO contracts due to lack of access to that HR data, hence we recommend this is completed internally.

From the data we have been able to obtain, we can say with some certainty that at least a fifth of researchers have been employed at Imperial for five or more years, and over a tenth have been at Imperial for eight or more years. This cohort, representing several hundred people, is significant and deserves to be better understood and supported.

It is clear from both the literature and from our data collection that many LTRs prefer to go unseen for fear that they don't adhere to the 'expected' early career profile of a postdoc and therefore may lose their jobs. Nonetheless many manage to remain in post for many years; our survey heard from 73 individuals who had worked as researchers for 14 or more years, with one working at Imperial for over 30 years.

Describing a typical LTR

Our data showed that researchers with up to seven years' postdoc experience were predominantly still 'early career' researchers, completing what could be described as an apprenticeship phase ahead of becoming an academic.

Once they had eight or more years' experience, LTRs were typically no longer 'early career' and were often providing higher-grade value associated with extensive mastery of skills and/or by providing support and management activities within a research team.

From our survey data we found that these '8+LTRs' were the same age or older than the average professor and were often older than their PI¹. Whilst they felt valued by their research team they felt extremely undervalued by Imperial.

There was a notable step change in senior academic activities completed by 8+LTRs: half were carrying out teaching (with a third writing their own lecture notes), three-quarters were supervising students, two-thirds were supervising junior colleagues, and over half were managing labs or people and/or carrying out various administrative tasks.

Taking attributes and attitudes into account, we identified three stages of researcher:

Apprentice / early career: Those with seven or fewer years' experience as a postdoc; these are the usual focus for most institutions' support and development activities

The turbulent years: Individuals with 8 to 10 years' postdoc experience who are deciding whether and how to try to remain in academia, or working out what to do as an alternative career if not

Established LTRs: Those who had established themselves as an important component within a research team or area, and who had found a way to live on – and with – the funding options available to them

Feedback from PIs

Feedback from PIs revealed that several are frustrated at the difficulties and limitations they face when trying to retain valued LTRs. PIs often felt the work they did to develop research staff goes unrecognised and undervalued by their department.

Contract issues

We found there to be notable inconsistencies in the ways that departments allocate fixed-term and open-ended contracts at Imperial. There also appears to be an over-reliance on contract extensions. Those researchers who have been moved to PTO contracts have often found this to be restrictive, notably in terms of the lack of academic recognition they receive once placed in what appears to be a 'support services' role.

¹ Average age categories taken from the LTR and PI surveys and use the median age category. See the summary survey data dashboards – links on page 13 - for more information.

Conclusion: 8+LTRs are the glue, the engine, the institutional memory, and the quality control that supports cutting edge research

During the research process we identified many LTRs with 8+ years' experience whose role was central to the effectiveness and efficiency of their research groups. Such systemic benefits often go unnoticed as they are not directly reflected by academic success metrics (TEF, REF, PI publications) and/or are not explicit in job descriptions.

We found that these 8+LTRs are often an important source of tacit knowledge; they know how to get things done in the lab' and within the wider institution, and they ensure that research practice remains high-quality, standardised, and consistent through time. Some 8+LTRs also provide a valuable middle-management role within larger teams, supporting PIs with admin' and line management, and mentoring of the next generation of researchers. Some are teaching and even writing lectures, and others have moved across a number of different research fields which has equipped them with significant multidisciplinary insight in terms of laboratory practice and new research opportunities.

In this report we identify a number of ways in which LTRs might be better supported at Imperial, highlighting opportunities to formally recognise and value the mentoring and management that many 8+LTRs are already carrying out. We provide recommendations for future support and development of LTRs.

We conclude that 8+LTRs work in the shadows of academia yet many are crucial for the delivery of high-quality research, the support of PIs, and the development of the next generation of researchers. Ultimately, the formal recognition of LTRs within HE is highly likely to benefit institutions and the wider academic system as well as the individuals themselves.

3. Recommendations

Institutional recommendations

- Imperial could take the opportunity to lead nationally on the recognition of LTRs who, if estimates are correct, represent at least a quarter of the national researcher community. Given the crucial role that LTRs play in supporting, sustaining and 'scaffolding' Imperial's research endeavour, we suggest that their inclusion enhances the quality, performance and efficiency of a research project. We recommend that Imperial collaborate with funders to ensure that LTRs posts are appropriately funded, so that LTRs can be employed and fully developed.
- Consider creating 'staff scientist' roles that are core funded, given that many LTRs are – de facto – already carrying out this kind of role long-term, on short-term contracts. Core-funded roles would allow individuals to access better support to do their jobs to the best of their ability, provide them with the recognition and respect they deserve, and facilitate workforce planning. Imperial should consider trialling such a scheme e.g. within one department or faculty
- There are a number of valid reasons why a researcher might reach the point of application later in their career: they may have worked in a variety of different teams and roles, or changed direction at a postdoctoral stage, taken longer to complete their PhD, taken a career break, or moved between working formats for legitimate reasons. We recommend creating bespoke opportunities to foster research independence for LTRs who bring valuable, alternative experience. e.g. seed-funding to create LTR fellowship applications, or ring-fencing a proportion of Imperial Fellowships for LTRs / 8+LTRs
- There are no junior lectureship posts at Imperial, yet there remains a large amount of admin' and line management that needs to be completed by someone, and our work suggests this is often done by LTRs. Further research should clarify how much of this goes unrecognised in researcher job descriptions. Some LTRs are already teaching and writing lecture notes so we suggest offering some form of junior lectureship to support these individuals and provide a way to formally acknowledge the support they already provide. Alternatively, some form of 'transfer to core funding' track might help to recognise this work and help support them into future lectureship positions
- Ensure that all researchers are:
 - Aware of their contract status and duration and can access a copy of their contract if they request it
 - Are informed about the differences between types of contracts and be made aware of the limits and opportunities available to them
 - Able to access a confidential, transparent HR source for contract advice
- Ensure PI progression and promotion criteria include recognition for supporting junior colleagues, postdocs and students, and that this is actioned in annual reviews
- Extend good-practice example from Engineering, to offer all researchers who have been employed at Imperial for more than 4 years a discussion with head of department (or similar) focusing specifically on longer-term career direction
- During this project we have been unable to gain access to reliable data on the numbers and location of researchers working on contracts in the Research family or on PTO

contracts; we strongly recommend this is calculated and shared in order to better quantify this population

- Review current practice in light of the legal requirement to move researchers from fixed-term to open-ended contracts upon four years of continuous short-term employment. Evidence we have collected suggests some practice at Imperial may be non-compliant (or at best, stretching compliance) in this area. It may also be useful to look at how other institutions are implementing open-ended contracts and whether their practices would be beneficial for Imperial to adopt
- Review researchers who are currently on PTO contracts. How many are there? Are they appropriate for research staff? Are processes consistent across departments?
- Better support PIs to provide appropriate career development advice to their postdocs: 40% of PIs said they had not been offered any training, yet they were the most popular source of advice for researchers, 74% of whom said they go to their line manager first

PFDC recommendations

- Begin to raise the visibility of LTRs as a valid, discrete and valuable sub-community of research staff at Imperial. Much of the success of any engagement to support, develop or advocate for this group – as much of the success in gaining their trust - depends on a clear statement that they exist and are valued
- In making LTRs visible, highlight the diversity of their career routes, in particular those who are legitimately delayed in becoming academics, along with those who have opted either to remain within the Research family or to pursue research careers in other, more hybrid, ways
- Given that 25% of Imperial's research staff are LTR, the PFDC should seek to increase their resources to ensure that this group are adequately supported
- Empower and advise researchers with information about contracts and funding types. Inform researchers of their rights and what they should expect from Imperial. Provide a clear summary of the structure of Imperial and where they should go for support. Where this doesn't occur, PFDC should advocate for researchers to access information as is their legal right
- Ensure all new researchers are added to the researcher mailing list as standard, with the option to opt out
- Create support tailored specifically for LTRs which should involve meet-ups for LTRs, talks from LTRs who successfully moved either into an academic career or outside of academia, information relating to funding and fellowships they remain eligible for, mentoring, training relating to management aspects of their role, and more information about alternative careers that reflect their experience and skills
- Work with 8+LTRs and design a development programme that better supports their role as a whole (including, for example, leadership, people and budget management, process management etc); this would elevate their status and provide evidence for their skills and experience when applying for other positions, above that of 'just a postdoc'
- If Imperial decides to support the creation of a staff scientist role, the PFDC should work alongside them to (a) create a development programme specific to staff scientists, in

order to provide further skills, and (b) ensure they are properly understood, recognised and valued by all academic staff, faculties and departments

- Support researchers to better manage their time so they can prioritise work that will lead to personal success, both in terms of their career progression and supporting their wider team. This should be part of the [Concordat's recommended 10 development days](#)

4. How many long-term researchers are there, and how are they supported?

How many LTRs are there in higher education?

Internationally, there is a consensus that postdoctoral contracts are intended to support early-career researchers, and to act as a temporary training position ahead of individuals either taking up a core-funded academic post or leaving academia for other roles. However, more recently there has been acknowledgement across academia that a significant minority of people remain in research positions way beyond the 'early career' stage, and data is emerging to support this.

A 2020 *Nature* survey of 7,670 postdocs across 93 nations found that 30% of respondents had undertaken three or four postdocs already with some as many as six or seven (Woolston 2020)¹. Mellors-Bourne and Metcalfe (2017)² reported that 34% of research staff had been on temporary contracts for more than ten years at one or more Higher Education institution. Hardy *et al.* (2016) found 30% of respondents to an Australian survey of postdocs had been in research roles for six years or more.³ Menard & Shinton⁴ concluded that at the University of Edinburgh, at least 10% of research staff had been employed for eight or more years on a succession of short-term contracts. Cardiff University told us that 20% of their research staff had worked at the institution for more than 7 years.

Mellors-Bourne and Metcalfe's (2017)² report quotes Vitae's 2017 CROS data in order to estimate the size of the UK's LTR population. This revealed that:

- 58% of researchers surveyed had been working as a researcher for five or more years, excluding time spent studying for a doctorate
- 33% of these had worked for five or more years in a research capacity within their current institution

HESA data state that in 2016-17 there were 49,085 researchers employed in UK higher education. Thus, we can estimate that if the CROS figures are correct, there may be as many as 28,000 researchers who have worked as postdocs for five or more years in the UK. Clearly then, there is a significant number of LTRs in higher education nationally and internationally. Understanding their role in the system is therefore crucial to supporting an effective higher education system.

HE is beginning to challenge the narrative around LTRs

There is an existing narrative around LTRs being "accidental", having not 'made it' as academics but actually, these individuals are often highly skilled and experienced, and there appears to be an increasing realisation that they are sometimes involved in crucial supporting roles within a research team that may not be clearly stated on contracts. Thus, their loss can at times be a significant blow to a research group and the umbrella department.

Biomedical Sciences is particularly highlighted as a discipline that relies on a large number of PhDs and postdocs and a proportionally smaller number of PIs. Bourne (2013)⁵ talks about a 'holding tank of frustrated senior postdocs unable to find jobs as independent researchers' and blames the system of grants, overheads and indirect funding. He also suggests that the training of future generation of skilled scientists is being diluted because there are too few experienced scientists to mentor, train and support junior researchers. Menard and Shinton⁴ describe three categories of LTRs with 'career researchers' being those who have actively decided to pursue this career route despite knowing it isn't recognised as a career. They have either made themselves invaluable to a specific research group through specialist skills or knowledge, or they are good at what they do and are very adaptable and flexible with a good network so can go where their skills are needed.

Through our research with the other members of Researchers14 we found that all of the institutions were aware of LTRs but while some ensured that consultations with researchers included LTRs, most hadn't specifically engaged with them in identifying their needs or support. One other institution, The University of Edinburgh, was actively talking to theirs and have a LTR staff network to support them. Those institutions that are directly engaging LTRs are focusing their discussions on the disproportional collateral impact upon this group of wider policies such as fixed-term contract use (e.g., King's College London) or Southampton University's Concordat implementation consultation working groups.

A number of institutions have research-focused career pathways with the opportunity for progression and promotion on the basis of a research-focused role eg. [University of Bristol's Pathway Two](#).

Internationally, the main difference in approach not seen in the UK is the use of 'Staff Scientist' positions. In the US, the Emory University School of Medicine created a Staff Scientist career path in 2016; by 2021 there were 138 staff working under this job title. Some work within research groups and some in core facilities, and their career path provides promotional levels similar to faculty members.

Are long-term researchers recognised at Imperial?

Most individuals representing departments and divisions within Imperial responded that they were aware of LTRs as a sub-group of the researcher community, who differ from the majority of researchers in terms of:

- A longer length of employment, typically more than four years as a postdoc
- An unusual career trajectory, which doesn't progress as quickly nor end as abruptly as those of most of their peers
- A desire for more recognition of their value in terms of a reduction in precarity (typically due to short contract lengths) and an increase in incremental promotional opportunities (to reflect their developing experience and expertise)

Several people identified a lack of cohesion and a variety of experiences and aspirations across longer-term researchers which made this group hard to support. Hence, some departments at Imperial tend to rely on central provision via the PFDC, Careers Support and central functions such as HR. That said, some departments (notably, those with larger numbers of research staff) have developed more bespoke support for LTR, including:

- Annual careers conversations between Heads of Department and researchers whom their local HR team identify as being employed in postdoc work for four or more years (currently occurring in the Faculty of Engineering)
- Occasional provision of bridging funding to tie researchers over from one contract to the next, where there is a potential hiatus in funding
- The creation or tailoring of 'hybrid' roles that allow a LTR to remain employed on a semi-permanent basis – by combining aspects of their research expertise with other professional functions (management/technical)

Success in this last strategy most often seems to rely on a senior academic's 'creativity' and 'autonomy' to deploy resources within their control to create such a role.

The most often mentioned examples of this kind of role are those of a **research/project manager** – who might remain research-active but have oversight over multiple research projects, and a PhD-qualified technical researcher, for example: a **research software engineer**.

Research software engineers are an interesting example of an alternative career pathway that has grown from a community of disgruntled researchers who advocated for positions that bridge

research and what is typically called a 'support service' role. This has subsequently been supported by funders, for example via [Research Software Engineer Fellowship](#) positions.

Many institutions and funders are now actively promoting researchers who act as team players and invest in the creation and maintenance of a research culture, rather than the more traditional individualistic 'apex predator' approach.

How many long-term researchers are there at Imperial, and where are they?

At Imperial the majority of researchers are employed under the '[research job family](#)', identify as **research associates**, and are employed on either **fixed-term** or **open-ended** contracts which are linked to **fixed-term funding** (e.g. a grant or fellowship for a set number of years).

There are some people who fit within our definition of a long-term researcher who are employed on Professional, Technical or Operational contracts (aka PTO contracts), which might be permanent or associated with fixed-term funding. Whilst these individuals are 'officially' support service staff, in practice they identify as researchers, and some or all their job activities are those of an experienced researcher. These people are far harder to quantify because they are 'hidden' amongst a larger volume of HR data covering those who most definitely operate as support staff. Despite significant effort we were unable to access HR data for those outside of the research family, therefore figures presented here are underestimates of the true number of long-term researchers at Imperial.

Data are summarised in Table 1, below. We found that:

- There are an estimated 1,720 people working within the Research Family at Imperial, of whom 370 (22%) have worked at Imperial for five or more years, 207 (12%) for eight or more years, 116 (7%) for 11 or more years, and 73 (4%) for 14 or more years. We have [found evidence that suggests](#) that 827 work in Engineering and 511 in Natural Sciences
- 1,356 (79%) are on fixed-term contracts: 145 of these have four or more years of service at Imperial and the longest length of service is 18 years
- 364 (21%) are on open-ended contracts; 343 of these have four or more years of service at Imperial and the longest length of service is 32 years

These figures reflect the number of people who have worked as a postdoc **at Imperial** for the given numbers of years; several will have been postdocs elsewhere beforehand, in which case their full tenure as a postdoc researcher will be underestimated. The figures here are lower than the national picture suggested by CROS 2017; we cannot be sure whether this is because we haven't been able to quantify LTRs on PTO contracts at Imperial, or because the CROS data is higher due to the particular employment profile of its 67 (in 2017) contributing universities. Nonetheless, we can say with some certainty that at least a fifth of Imperial's researchers have been employed at Imperial for five or more years, and over a tenth have been at Imperial for eight or more years. **This cohort, representing several hundred people, is significant and should be better understood and supported.**

The data from the research family at Imperial suggest there is significant drop-out between each stage as researchers either take up more established academic roles or leave academia for alternative employment.

Notable drop-out appears to occur at the 5-7 year stage, and then again at the 8-10 year stage. Those who remain as LTRs for 11+ years appear to then remain in the system indefinitely, perhaps because they are then deeply associated with a specific group and research team. In these cases, their employment heavily depends on the continuation of that group and is highly vulnerable to the retirement of their PI. We interviewed a LTR in this exact position as part of our research who we quote later in this document.

Imperial HR data relating to researchers (Research Family only)	Postdoc researcher stage					TOTAL
	< 5 years	5 to 7 years	8 to 10 years	11 to 13 years	14+ years	
Known numbers (research family only)	1,350	163	91	43	73	1,720
% Researchers on an open-ended contract (research family only)	4%	71%	96%	98%	99%	

Table 1. The number of researchers employed within Imperial's research family, split into groups by length of time as a postdoc

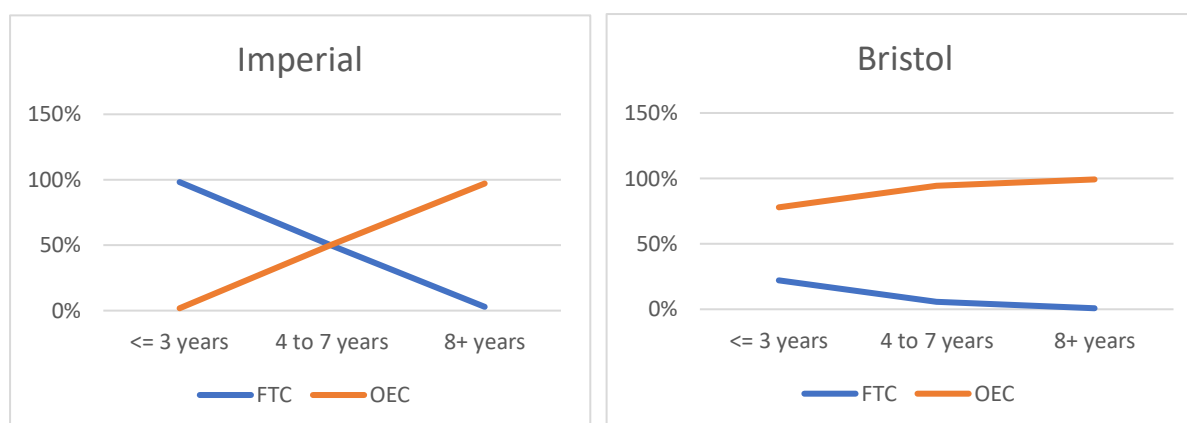
Imperial v The University of Bristol's researcher contract practice and guidance

The charts below compare the proportion of researchers on fixed term (FTC) versus open ended (OEC) contracts at Imperial in comparison with the University of Bristol. Although both universities are similarly compliant regarding the types of contract that they award, they differ in their approach to the flexible interpretations of the rationales for those contracts, and the preference given to each type of contract in their decision-making process.

Where Imperial's approach appears to default to a FTC unless they *cannot* do so (e.g. the researcher has more than four years guaranteed personal funding), Bristol awards an OEC unless there is no choice but to make the contract fixed term.

The impact of this is most acutely felt in the 'researchers with 4 to 7 years' experience' range, where it appears to be Imperial's practice to more often deploy reasoning based on (for e.g.) fragility of funding, changes in role, minor breaks in service, etc. to adopt a FTC wherever possible.

Given the significance of stability and perception of value for the well-being employees and of their relationship with Imperial, and the relatively low additional risk to the organisation of placing employees on OECs with fixed term funding over FTCs, we strongly recommend a review of HR practices in this area.



It is also of interest to compare the guidance between the two institutions. The [University of Bristol's managers' guidance](#) states:

" Research staff ... should not be automatically employed on FTCs when they are funded by research grants. This activity is central university business and reached agreement in 2015 through University governance procedures (including Senate) that it is normally appropriate to place such research staff on open-ended contracts from the start of their ... employment if funding is expected to continue for at least 12 months.

Contracts where funding is available for less than 12 months should be issued as FTCs..."

In contrast, the corresponding Imperial position is 'Where the individual is needed for a fixed period of time for a specific purpose e.g. to work on a research project. Normally less than 4 years'; see the guidance at https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/hr/public/recruitment-/zero-hours/contract_guidance.pdf. Here guidance is more oriented towards giving FTCs to as many as can have them, unless prevented by the four year limit.

5. Describing the typical LTR

We identified five different stages of researchers at Imperial, categorised according to the length of time they had spent as a postdoc. During the survey we asked for demographic information including average age, gender and ethnicity for each group. We also asked researchers to comment on statements relating to perceived job security and rate their perceived value and work/life balance. The results are summarised for each researcher stage in Table 2 (see appendix), alongside the PI demographic summary data collected from the PI survey.

Researcher data identified some interesting differences between the five researcher stages:

- Average age increased such that the most experienced researchers were the same age or older than the average professor, and often older than their PI²
- Gender balance remained broadly equal across the five researcher groups, although there was a dip in female researchers employed with 8-10 years' experience, which aligns roughly with the time many women choose to have children. There are far fewer female professors than there are female researchers
- Those with 8-10 years' postdoc experience appear to be in the most turbulent stage: They are doing the most CPD of all stages and are most likely to be looking for employment. They are least likely to feel secure in role for the long-term, and one of the groups who is also least likely to feel secure short-term. They are also the researchers who feel the least valued by their line manager, research team and by Imperial. Their work/life balance is one of the lowest of all stages
- Those who manage to remain employed as researchers for 11+ years report feeling a little more secure in the short-term but continue to feel insecure long-term. Interview data suggests they may feel they have a little more stability because they have co-created a niche for themselves with a trusted PI and within a stable research team

Survey and interview data identified individuals within each group as having a similar collective mindset, moving from the excitement of starting the first postdoc ('<5 years'), to the turbulence of trying to remain in academia or consider the alternatives ('8-10 years'), to reflecting on the significance of their career as they began to consider retirement ('14+ years'). On average, researchers felt much more valued by their line manager and research team (mean score of 7.5 out of 10) than by their department or by Imperial (mean average of 4.5 for department and 3.7 for Imperial).

Data dashboards of survey results

A summary dashboard of all survey data, excluding free text questions, is available via this [Imperial LTR Summary Dashboard link](#). We estimate that this survey heard from over 50% of the LTR population at Imperial; we cannot be exact because we haven't been able to access the HR data necessary to quantify the number of postdocs working on PTO contracts.

A summary dashboard of all PI survey data, excluding free text questions, is available via this [Imperial PI Summary Dashboard link](#). Results are skewed towards engagement from senior PIs, notably professors.

² Average age categories taken from the LTR and PI surveys and use the median age category. See the summary survey data dashboards – links on page 13 - for more information.

LTR job responsibilities

There was a notable step change in senior academic activities completed by LTRs with 8+ years' postdoc experience (see Table 3, below). Half were carrying out teaching (with a third writing their own lecture notes), three-quarters were supervising students, two-thirds were supervising more junior colleagues, and over half were managing labs or people, and/or carrying out administrative tasks. This clearly shows that many LTRs carry out significantly more senior responsibilities than more junior postdocs.

Activities	Postdoc researcher stage (N=239, of whom 212 were LTR)				
	< 5 years	5 to 7 years	8 to 10 years	11 to 13 years	14+ years
Teaching	22%	33%	50%	48%	47%
Writing lecture notes	15%	18%	33%	36%	28%
Supervising students	56%	69%	76%	75%	69%
Supervising more junior colleagues	37%	47%	63%	66%	63%
Writing for publication	59%	74%	87%	89%	78%
Writing or proofing grant applications	41%	48%	61%	71%	59%
Lab or people management	22%	46%	57%	46%	41%
Administrative tasks	33%	41%	61%	59%	44%

Table 3. The activities carried out by researchers with increasing lengths of postdoc experience

Contract experiences: time as a postdoc, gender, ethnicity and first language

Although individual LTR's contract status is central to their experience, it is often assumed that factors like gender, ethnicity, first language and time as a postdoc shape this experience to a greater degree. This is underlined by the emphasis put on these factors by initiatives like Athena Swan, EDI, etc. In exploring the intersection between these factors and contract types, we ensured that these areas received attention, in combination with the particularly 'contractual' issues of: time to end of contract, experience of bridge funding, contract extensions and part-time working.

Time as postdoc

We compared experiences between the five researcher groups. Unsurprisingly, the likelihood of experiencing bridge-funding increased as length of time as postdoc increased, from 33% in early career researchers (<5 years) to 59% in those with 14+ years as a postdoc. If a person had always been a postdoc at Imperial, they were also more likely to have experienced bridge funding (35% versus 22%), suggesting that they may have created enduring positive connections with PIs who know them well and are keen to retain them.

Those with 8 to 10 years' postdoc experience were most likely to have less than a year left on contract (63% versus just 42% for those with 5-7 years' postdoc experience). They were also the most likely to have taken a career break (maternity, paternity or sick leave); career breaks had been

experienced by 30% of 8-10 year and 11-13 year postdocs in comparison with only 9% of those with 5-7 years' postdoc experience.

Gender

There were slightly more male than female researchers at all but one of our five researcher groups, representing length of time as a postdoc.

Proportionally more women than men had less than a year left on contract (59% v 48%), and far more female researchers had taken a career break than men (32% v 8%); this is highly likely to be due to maternity leave. A total of 5% of male researchers work part-time in comparison with 9% of females.

Ethnicity

We compared those who identified as 'White' with all other ethnic groups (sample sizes were too small to compare between all ethnic groups). This showed that those identifying as White were more likely to be on a contract extension (45% v 29%). Several researchers told us that visas were an issue, exacerbated by Brexit, and this suggests that gaining residency is likely to be key to staying as a researcher in the UK long-term. More respondents who identified as an ethnic group other than White had worked outside academia (e.g. in industry) than those identifying as White (8% v 4%).

English as a first language

LTRs who speak English as a first language were more likely to be on a contract extension than those whose first language wasn't English (47% v 34%). There are many reasons why this might be the case. Certainly, feedback from interviews suggests that people who grew up outside the UK can feel there is a 'culture clash' in which they are less understood or considered to be either 'too direct' or 'too weak' when compared to what they see as British cultural norms, and that this could hamper their employment opportunities.

"I could have handled past situations better, but I had a lack of understanding of British culture. My expectation was not to let problem fester, be straight face to face and want to be direct... now it feels like it's too late."

Interestingly, those LTRs who identify as British Asian / Asian were more likely to have spent all of their postdoc years at Imperial than any of the other four ethnic groups (46% versus 38% or lower for the other four ethnic groups).

Conclusion: attributes and contract experiences

Although the above presents evidence of a variety of attributes that may impact upon contract experience, what our interview work suggested in fact is that the most significant factor that affects LTRs contract experience is less an 'additional' factor, and rather their fundamental knowledge of the contract itself.

Many researchers are unsure what type of contract they are on, or for how long. Many do not know (or perceive any) difference between a new contract and a contract extension. Some are unclear about the nature or source of their funding. Some are unsure about their rights as employees to see or consult on their contract or its terms. This also makes self-reported contract data less reliable, hence these findings have to be read with caution. We have considered these issues when identifying recommendations for the future.

The three stages of researcher

Our analysis identified a clear difference between those with eight or more years postdoc experience (8+LTRs) and their less experienced colleagues.

Common attributes of 8+LTRs included being older (typically 35+ years), having a long-term partner whose career also needed consideration, be settled in the geographical area and so less keen to move away, to have children and to own a house. They may also have caring responsibilities, e.g., for older family members. In addition to this, these individuals were more likely to be carrying out senior job role activities including writing and delivering teaching and supporting students and/or junior colleagues.

“As a postdoc you're expected to be young, flexible and put work first, whilst as a long-term postdoc you're generally more settled and likely to have a family or other commitments, but work cannot be adjusted to these requirements. Particularly for women it is barely possible to have a family and work in academia” LTR, 11-13 years' experience

Attitudinally, our interview and survey data suggest that postdocs with up to 7 years' experience can still be considered 'early career' or 'apprentice' researchers. From that point, there are two further groups:

- **The turbulent years:** Individuals with 8 to 10 years' postdoc experience who are deciding whether and how to try to remain in academia, or what to do as an alternative career.
- **Established LTRs:** Those who have established themselves as an important component within a research team or area, and who have found a way to live on the funding options available to them

6. Negative outcomes experienced by LTRs

In the survey we asked long-term researchers what they see as the negatives associated with working in postdoc research beyond five years. Their answers were coded thematically and are summarised in Table 4 (see appendix), together with representative quotes from LTR. The themes identified are listed in order of most to least common, as follows:

- Uncertainty, precarity, and stress associated with short-term contracts
- Lack of recognition and being undervalued by other academics and the institution (considered a failure, no desire to retain)
- No career progression: there is no status or pay grade that reflects their expertise and experience
- Increasingly limited funding/grant options
- No/limited pay progression: for most LTRs the research associate grade forms a ceiling above which they cannot be promoted
- Impossible to show independent research agenda and outputs
- Caring about the research team / associated admin negatively affects solo progression

In addition to the negative issues surfaced in the survey and summarised in Table 4, another aspect of precarity was surfaced during interviews, this being the highly unbalanced power dynamic that exists between a researcher and their PI. In some cases, this can lead to significant worries for researchers, relating to:

- Being trapped on short-term contracts by one PI, so becoming increasingly beholden to one person and perceived as less employable by others
- The (un)popularity of their PI affecting their status in a department and more widely in their field
- Being keen to avoid any conflict with PI in case it harms their career, so feeling unable to ask for details about their contract and future or foster an independent research agenda
- For those working decades for one PI, their career can end abruptly when their PI retires

Relevant quotes include:

"I have very low confidence and I don't want exposure; I want to be a senior scientist. You have to talk about how great you are to do the traditional route. I have thought about quitting so many times and line manager says you are amazing, stay, you need to stay." Female, 31-40, Faculty of Medicine

"My line manager has always been opaque about where the money is coming from, which makes life a little bit difficult and when I ask, I'm told the information as though it isn't that important, but it is quite important as it affects my employment." Male, 31-40, Faculty of Natural Sciences

"I am lucky as my PI wanted to keep me... I moved with him when the group moved here from another university... Future planning is difficult... I don't really know; it is a worry as my PI will retire properly soon and what becomes of me, I am unsure." Male, 51-60, Faculty of Medicine

7. Positive outcomes experienced by LTRs

In the survey we asked long-term researchers what they see as the positives associated with working in postdoc research beyond five years. Their answers were coded thematically and are summarised in Table 5 (see appendix), together with representative quotes from LTR.

The themes identified are listed in order of most to least common, as follows:

- Freedom to focus time and energy on high-quality research
- Source of deep knowledge, experience and continuity
- Focus on collaboration, team cohesion, supporting others
- Avoid negatives associated with an academic career pathway
- Independence, confidence and autonomy
- Flexibility (family, work/life balance)
- Opportunity to work across breadth of research, supporting multidisciplinary enquiry

Overall quotes:

"I can stay in science/research without pursuing the faculty track ... Some of us got into science because we LOVE science and it shouldn't be coming down to faculty positions or leave the bench. I help to ensure continuity in the lab. I would guess that most PIs are not provided with funding to hire a permanent, experienced lab manager. This can greatly influence the continuity and productivity of a lab. PIs with large numbers of new postdocs/students absolutely do not have the time to drill down into raw data and analysis techniques with them, simply because there is not enough hours in the day. Having experienced researchers available helps fill this gap and goes a long way towards ensuring scientific rigor." Female, 31-40, Faculty of Medicine

"Research work is interesting! Teaching and supervising students can make you feel like you are making a difference when you're stuck in your research. There is the chance to work on many problems with different interesting approaches and keep up to date with new developments/technologies. And flexibility of working hours great for life with two kids." Male, 31-40, Faculty of Medicine

"Being a long-term researcher gives stability. You're able to re-train, build up knowledge and expertise in a new field, without continually worrying about the next grant/having to move labs. You have the chance to build strong working relationships and networks and deliver on longer duration projects, plus it's much easier invest in self and the research group in sustainable, meaningful way. Personally, I was comfortable taking Shared Parental Leave with the knowledge that I would still have a job at the end of it." Male, 31-40, Faculty of Engineering

"I get to carry on doing research, acquiring new skills, networking, getting involved in industry and clinical applications. I also think that experienced postdocs are key in the development of research groups as we help PIs with multiple tasks while providing stability in the group and retention of knowledge (PhDs and postdocs normally come and go and the specific technical skills are sometimes lost due to the lack of overlapping between posts)." Female, 41-50, Faculty of Engineering

8. PIs' experience and opinion of LTRs

PIs typically manage several junior team members

Key findings from the PI survey revealed that 42% of PIs said they had worked as a postdoc for 5+ years before moving into a core-funded, academic role.

LTR comments suggested that they are often helping PIs to line-manage students and other research staff; we cannot say if this is unofficial, but it is perceived as such by researchers who are often happy to do it, but want recognition for it. Given that PIs said they directly managed and oversaw an average of six people (two postdocs, one technical/admin/support staff member, and three PhD students), it seems likely that they would benefit from such support. At Imperial some research groups are very large; the maximum number of people working under one PI was 53. It must be hard if not impossible for a single PI to line manage all the members of a large team directly; given feedback from LTRs it seems that this responsibility is shared with some of their more senior research staff, so allowing them to learn to manage and support others.

Many PIs are aware of alternative job titles for LTR

24% of PIs surveyed said that researchers in their team had job titles that didn't map to the traditional research pathway. On average, they had one person in this situation at the time they were surveyed (the maximum was five). Alternative job titles included: lab manager, research manager, data analyst, research operations director, senior bioinformatician, research engineer, and investigator scientist.

Little perceived support for developing research staff

A total of 40% of PIs surveyed said that they had never been invited to training at Imperial related to managing and developing research staff; a further 13% had been invited but had not attended.

When asked to rate on a scale of 1 to 10 how much they felt the work they did to support and develop research staff was recognised and valued by their department, the mean average was 5.5 ± 3.0 . There was notable variation in response to this answer, which didn't associate clearly with any one Faculty or department. Some PIs felt highly valued by their department for these activities whilst others felt their support to develop others wasn't recognised at all.

PIs retain some researchers because they value them highly

87% of PIs said they had extended the contract of a current researcher and 64% had used bridge or alternative funding to support researchers who were between contracts.

When asked why they did so, answers focused almost exclusively on two themes: because the researcher was high quality and deserved their support, and because the researcher offered significant value and understanding of the research group:

"Because those researchers are essential and have all the knowledge of years of research - if they go, the knowledge will take years to bring back, if ever."

"I frequently extend contracts. I seek to nurture talent and keep the team together as a unit whilst facilitating fellowship proposals etc."

"Yes, I have employed one researcher for 33 years one for 14 years"

"I have not yet, but I am working towards offering the possibility of naming/hiring my Research Technician as a postdoc in a future grant... that's what I would like to do, but

the academic system and current structures does not make it easy at all neither for me as PI nor for my RT when thinking long-term. I have also named another Research Technician on a grant, who currently became unemployed when a different PI could not renew his funding. This RT has over 20 years of research experience, completed a PhD and also worked as a postdoc for a few years... he's very senior, older than myself, but one of the best at what he does. Without his work the outstanding research programmes of two senior professors at Imperial would not have been possible. I believe that one of the reasons he has found it difficult to move upwards is because previous bosses have exploited his tremendous technical expertise while never fostering an independent career and providing the support, guidance, and leadership required to do that"

Some PIs are frustrated at limitations in retaining LTRs

During the PI survey and interviews we asked for opinions relating to long-term researchers. The majority of PIs were very vocal about the value of their long-term researchers, and many were clearly frustrated at the lack of opportunities available at Imperial to support the retention of high-quality long-term researchers. Twenty-three PIs even left their contact details, saying they would find time to be interviewed about the issue if needed. PI feedback includes:

"I feel very strongly about the importance of having long-term researchers that are not necessarily following a standard academic trajectory. The know-how continuity in an experimental lab is very important... the more senior and experienced a researcher is, the more likely they have a family and other financial obligations, which makes short-term contracts much less attractive for them... Does the College prefer to run its research exclusively on young and inexperienced researchers, with 2–3 year contracts? That is a terrible strategic mistake, the same way as you are not hiring academic professors with 2-3 year contracts. Anything that the College could do to enable more academics to hire research staff with long contracts would be immensely important for science and tech development output."

"After training and supporting postdocs, they left to take up lectureship posts at other Universities, as Imperial was not (and does not) provide junior lecturer posts. I lost valued members of staff and was expected to be "happy" that they had left..."

"I don't think the stress of us finding funding for long-term researchers is sufficiently appreciated by the department/college. These are excellent researchers who are keen to keep their research going without too much stress about the lengths of their contract, and who are increasingly turning to other careers (mostly in the industry) due to the temporary/contractual nature of their postdoc positions... it would be good to have a more stable research career path as an option for the really good researchers."

"The College must find a way to retain highly skilled and often nearly irreplaceable investigators who for one reason or other have not made it to PI status. That's what successful institutions do around the world."

"You are kidding regarding support and developing staff! ... Promotion to Academic Research Fellow was counter-productive, as the new salary scale meant that the UKRI funded contract was significantly shortened. HR ... sprung this on us both quite late. So the PDRA was penalised for getting promoted and was so disillusioned by this they left and got a job outside the university research sector."

9. Exploring contract issues

Although they appear on the roster as 'staff', researchers are probably better understood as having an ongoing 'freelancer' relationship with their employer. While many are rightly employed on a temporary basis for a discrete project, LTRs may require the provisions of a more established employer-employee relationship, that should be reflected in their contract.

Since 2009, universities in the UK have been required to assess those with more than 4 years continuous employment for a move to an open-ended contract, albeit with fixed-term funding. Since assessment is largely down to each organisation (or section of an organisation), there is considerable variation in how this is done.

In combination with the more or less unique nature of each researcher's relationship with their employer (organisation, group, or individual), the result is a number of issues related to contracts.

Potential inconsistencies in departmental approaches

Natural Sciences has the highest proportion of people on open-ended contracts (38% in comparison with 28% in Engineering and 21% in Medicine). When we looked at departmental level, it was clear that the School of Public Health in the Faculty of Medicine was much more likely to have researchers employed on open-ended contracts than other departments in Medicine, Engineering or Natural Sciences. This clearly suggests variation in the way that different departments interpret the policy regarding which contract is most appropriate for each LTR. Whilst differences may be justified, it is key to better understand how decisions are being made, to ensure consistency and compliance across the organisation as a whole.

Explicit avoidance of open-ended contracts (OECs), both within and beyond HR

The relative autonomy of local departments and PIs to recruit, has resulted in instances of avoidance of OECs:

"I have worked here for over 10 years but have been switched from Imperial to MRC every 2-3 years to avoid allowing me any statutory rights"

In some cases, workarounds to an OEC contract have been done with HR knowledge.

"I was originally on a 5-year grant but with a contract of only 3 years. At the end of these 3 years, I have been extended for the remaining duration of the grant."

Lack of internal consistency on funding decisions

One option for a researcher is to apply for an internal fellowship. Again, however, the criteria for application appear inconsistently communicated:

"I applied for 1 year fellowship from Imperial and I met the criteria ... was rejected, and when I asked for feedback they said not enough papers BUT I said the form didn't ask about that! One person got it who I met at a PFDC and they had NO papers at that time so this seems that the feedback is made up! They just decide but don't really have a clear reason, and the reason they give at feedback isn't the real reason but they ... I took it literally so avoided applying again until I have enough papers when in fact this doesn't seem relevant."

Over-reliance on contract extensions

At least 58% of long-term researchers (5+ years postdoc) surveyed had experienced a contract extension at Imperial, 28% had used some form of bridge funding between contracts, and 9% had held temporary honorary status to provide career continuity. Many people who had experienced extensions talked about the stress related to the process, because it is often last minute, and HR often needs time to process it.

"I've been at Imperial for 15+ years and can't remember how many contract extensions I've had. They are painful to negotiate and slow to action. They usually end up needing to be bridged, as they are not resolved quickly enough, so the first usually runs out before the next has begun. It doesn't matter how much notice is given."

"I have had many contract extensions ... But it is not a very well-managed process - just involves informal conversations with line manager so doesn't feel very secure."

"Yes, I've had 5 [contract extensions]. They are a blessing and a curse. Typically, extremely short (<6 months) they stop you having to worry about finding another job, but not for very long, so after multiple extensions you become 'permanently temporary'. Obviously, you cannot settle or buy a home if you may live and work elsewhere in a few months, and you cannot plan for future projects or fellowship applications either."

Prevented from applying for grants because of contract length/type

Although contract extensions appear a potential policy panacea, they make long-term planning very difficult, and raise significant EDI issues related to the choice of 'who' to extend.

"I have had 6 contract extensions, mostly for 6 months so as not to have to reapply for my post, and one 1-year extension. It doesn't allow one to make any proper plans or build up a proper career path, and there are fewer benefits than for staff on open ended or permanent posts. The major disadvantage is that one can't complete grant applications in the role of a Principal Investigator and form your own research team."

"Precarious contracts promote inequity in progression and retention in academia. Job insecurity means you spend a lot of time searching for "backup roles" or next posts. It causes more anxiety and mental health issues for those with sole responsibility of dependants. Wealth, dual income households, and those who can relocate/increase hours are more able to tolerate this and remain in a job that they love. It pushes people who need a reliable income out of the sector and causes a system wide EDI concern."

Moving to PTO (support family) contracts causes problems

One issue that LTRs have when moved to PTO contracts is the reduction in perceived research status:

"... the number one negative is that you do not recognize many of us [on PTO contracts] as scientists. I am on the PTO pay scale and the number of other PTO staff in professional services who think I'm a support service for them is downright astounding."

"They lump people by their job titles or job family. They assume I only do support work and disregard my work. The HoD talks about "people on the PTO family" as though we are nothing to do with research and we are just support staff: so disheartening to hear!"

“Now I am classed as professional services it is even harder... I cannot hold a grant or be primary supervisor for PhDs. I supervise 3 PhD students but cannot be their primary supervisor. I am doing everything a normal academic would do but without the badge... people assume I am an academic as I am older as I look older.... when people ask though and I say I am a technician people are confused. I don't get the same website space or exposure by Imperial... other academics have to be REFable but I am still publishing papers and fewer conversations about how we as PTO researchers can display our value”

When we surveyed PIs, 8 out of 52 (15%) said they had had researchers in their team who had moved to a non-research specific contract (e.g. a PTO contract). Sometimes this is a positive move:

“One postdoc moved to the lab manager role, which provided the person with the position they were looking for. Also, an imperial postdoc started to work as an EM facility manager of the department. Both are happy with their new role.”

Sometimes, however, it seems to be the only (limited) option to continue doing work that they enjoy.

“Both my long-term researchers moved to PTO contracts... despite a wish to continue with academic research, the project work they were funded by did not permit enough time to write and publish the research papers necessary to secure academic or fellowship positions.... the UK funding system does not allow these people to raise their own grant money through proposing research grants themselves.”

A further issue is a lack of grade progression for researchers on PTO contracts, which would be available in either research or academic role:

“Why on earth does Imperial College not have staff scientist pay grades? There are clearly people doing staff scientists roles all over the college (just look at some job titles and you will see it plain as day). But where are they all on the pay scales?”

10. How might LTRs at Imperial be better supported to develop their careers?

Events and activities that long-term researchers said they have found useful

A total of 99 long-term researchers left a comment in response to this question. Findings revealed that:

- 61% of LTRs who answered this question directly mentioned the PFDC positively
- 19% of LTRs said they found mock interviews helpful, and 14% said the fellowship writing courses were helpful
- 18% of LTRs said they found informal discussions with colleagues at and outside Imperial to be helpful
- Other commonly mentioned events or activities that LTRs had found useful for career development included the CV clinic (8% comments), talks or networking with people outside academia (7% comments), annual reviews (5%)
- A small number (3% or lower) of LTRs mentioned writing retreats, lectureship courses, leadership courses, Springboard, health & safety training, the Twitter academic community, meetings with Professors, Imperial College London management courses, the research survival kit, EDU courses, and group coaching

Some representative quotes are shown below:

PFDC

"Everything the PFDC does! It's an incredible resource and I am forever pushing my colleagues towards the services provided. Clear, pragmatic, realistic advice, based on evidence and observation, about how to proceed with all facets of academic (and non-academic) life. Imperial's PFDC is an invaluable resource."

"PFDC were a great help in my fellowship application. I did "starting a fellowship" course, 1-1 and mock interview. Safely say I would not have got it without them. "

"Workshops and seminars organised by the PFDC, I think they do an excellent work. I attended a few about my research vision, innovation and industry, and women in academia. They provided very useful tips, and it is a great opportunity to network and meet other people across Imperial in the same situation"

"The PFDC workshops are really helpful (eg creating a research vision, networking, fellowship guidance, skills analysis, UNlque, etc). The writing retreats every other Thursday morning are also really helpful - I try to use them to develop my own research (eg writing a fellowship application). It's nice to have that "protected time" to develop my own independent research career"

Discussions with colleagues

"Internal meeting for long-term postdocs with Prof. X. I valued this highly as it was the first time anyone had acknowledged the special place that senior postdocs play in Academic Medicine research (essentially, they are running the labs of senior academic clinicians who have other clinical commitments)."

"I have found opportunities to work with people/organisations outside my research group most beneficial - the benefits to career development (e.g. building networks) are sort of 'built in' there and just happen."

Talks / networking with those outside academia

"Physics department careers events with guest speakers from outside academia discussing their jobs and career paths. This was very helpful as it helped me realise the variety of jobs out there."

Career support/training that would feel relevant and helpful in future

A total of 103 long-term researchers left a comment in response to this question. Answers were diverse, and revealed that:

- 16% of LTRs requested more information about alternative career pathways, in particular outside academia and including things like job shadowing
- 13% wished they had the support of a hands-on mentor
- 13% requested support for fellowship and grant applications
- 9% asked for assistance in identifying funding that LTRs are eligible for
- 9% asked for departmental recognition and support, involving a connection with someone outside of their line management and research group who they could go to with questions and suggestions
- 9% asked for training on how Imperial works in practice: what is managed and organised at a departmental v faculty v central level, what funding is available internally for LTR (e.g. fellowships) and how are these judged, what permanent positions are available, who and where to go to for contract, redundancy or redeployment advice, how to become research-independent
- 7% said they didn't feel they had time for career development as their job took everything from them; these people may benefit from training on how to set boundaries and give permission to themselves to take career development time
- 5% wanted more information on how to transition successfully to a lectureship
- 4% specifically asked for support and training that is specifically relevant to LTR, including some form of cross-faculty group meetings
- 4% asked for training on how to teach effectively
- 3% asked for support relating to managing people and finances
- Other training that was mentioned included transparent information on rights, redundancy, bullying etc, wellbeing support, recruitment events tailored to older potential recruits, and how to successfully bridge working in industry and research (both in terms of collaborating with industry, and transitioning from academic into industry after a significant time as a postdoc)

Representative quotes include:

"I would like to learn more about project management, how to prepare a budget for a grant, team management, how to deal with team's mental health issues and support them to overcome such issues."

"I would like a 'long-term postdocs' support group - a group or get together of researchers who are not on the lecturer upwards trajectory would be quite helpful."

"I would like to know about/attend a career fair aimed at early and senior postdocs"

"More support for those who might want/need to transition outside of academia. Work shadowing/placement in industry?"

"Jump to lecturer seems like it has lots of difficulties with things like the "hidden curriculum" things that are unsaid or implied that I and many other researchers feel we are missing out on but need to be successful. Things like which funding is viewed as more prestigious, how to read between the lines of lectureship job description, what are the universities priorities i.e REF vs KEF vs TEF. In other words all the biases that exist but are not outright explained."

"More clarity over the possibilities of ascending to permanent positions here at imperial, e.g. what are my realistic chances, what positions are likely to be available, and what could be done to improve my chances."

"Better recognition and support by Imperial of career progression paths, job security and manageable workload for post-doc researchers on fixed-term contracts. Specifically for the College to formally recognise (including in promotion decisions) a researcher's real-world impact beyond peer-reviewed articles - such as impact on policymaking; high-profile work in mass media; collaboration with industry/Government/NGOs; funding bids they have led/been on but could not be PI for (due to Imperial's rules). Imperial to make rules clear on how post-docs can become more independent as researchers (Co-I and PI roles). Key here is to permit post-docs on short fixed-term contracts to be PI on funding bids (especially for their own funding bid ideas) rather than needing to find a permanent academic staff member to be PI (and get credit). If such funding bids are successful the postdoc's salary would, of course, be funded and their post secure. I do not see why they need to already have a contract running beyond the lifetime of the project for which funding is being sought. This keeps postdocs from becoming independent researchers unless they go the Lecturer route. More availability of fellowships that do not restrict eligibility to penalise postdocs who are many years post-PhD or in postdoc role but who have not achieved research independence."

11. Appendix

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Attributes	Postdoc researcher stage (N=239, of whom 212 were LTR)					Professors (N=50)
	< 5 years	5 to 7 years	8 to 10 years	11 to 13 years	14+ years	
Survey sample size (Maximum)	27	90	46	44	32	35 provided attribute data
% Female	47%	49%	45%	51%	48%	31%
% Ethnicity 'White'	50%	79%	78%	69%	73%	91%
% UK citizen	17%	53%	56%	63%	78%	69%
% English as first language	39%	49%	53%	47%	54%	65%
Age group (Median)	31 - 40	31 - 40	31 - 40	41 - 50	51 - 60	51 - 60
% Taken 4+ CPD days in last 12 months	33%	47%	50%	40%	13%	-
% NOT currently looking for employment opportunities	19%	20%	17%	27%	28%	-
Perceived value by line manager (Mean \pm SD score out of 10)	7.7 \pm 2.1	7.8 \pm 2.3	6.8 \pm 2.7	7.9 \pm 2.2	7.0 \pm 2.8	-
Perceived value by research team (Mean \pm SD score out of 10)	7.7 \pm 1.7	7.5 \pm 2.3	6.7 \pm 2.9	8.4 \pm 1.7	7.1 \pm 2.5	-
Perceived value by department (Mean \pm SD score out of 10)	4.8 \pm 2.8	4.7 \pm 2.3	3.9 \pm 2.4	5.0 \pm 2.6	3.9 \pm 3.0	-
Perceived value by Imperial (Mean \pm SD score out of 10)	4.4 \pm 3.1	3.9 \pm 2.2	3.2 \pm 2.1	3.8 \pm 2.4	3.2 \pm 2.4	-
Work/life balance rating (1 to 10, Mean \pm SD score)	5.7 \pm 2.6	6.1 \pm 2.2	6.0 \pm 1.6	6.0 \pm 2.0	5.5 \pm 2.6	-
% Who agree they feel secure in current role in the short-term	47%	54%	50%	56%	50%	-
% Who agree they feel secure in current role in the long-term	6%	4%	3%	5%	13%	-
Typical 'mindset'	"I'm in!"	"Should I stay?"	"I'm being pushed out!"	"I'm still here"	"Is this it?"	-

Table 2. Attributes and opinions of researchers with different lengths of experience (in years). Where we have data, we have also provided comparators for Professors.

Theme (negative outcomes experienced by LTR)	Percentage of LTRs (5+ years' experience) identifying with this theme	Indicative quotes
Uncertainty, precarity, and stress associated with short-term contracts	37%	<p>"One relevant issue is postdoc job insecurity and the impact on managing household financial risk including where you can afford to live. I have had to move to less and less expensive regions further and further from London to reduce size of mortgage which would be a risk if I should again be made redundant"</p> <p>"Working with job uncertainty adds to daily stress levels, as well as making it more difficult to secure a mortgage and plan for my family's future."</p>
Lack of recognition and being undervalued by other academics and the institution (considered a failure, no desire to retain)	30%	<p>"There is no appreciation of our achievements. Most of the time, postdocs write the grant applications which get submitted under their line manager's name as there is lack of project funding for postdocs. Even though an experienced postdoc is easily doing all the work a lecturer would do plus wet-lab work, the salary and title doesn't reflect that."</p> <p>"Old fashioned views about ambition and success dictate that to some people you are seen as unsuccessful. this attitude doesn't make much sense since most people spend >5y as postdocs in my field."</p> <p>"Whilst I feel valued by my PI & colleagues, I have no sense that the university appreciates my role (and everything I do within the college), unless I'm bringing in money or following the traditional academic track"</p> <p>"There is a stereotype that you are not independent from your PIs ideas, however every senior postdoc I have met at Imperial is super independent and knowledgeable and not simply an extension of their PI."</p>
No alternative career path or progression for researchers outside of traditional academic pathway	26%	<p>"I no longer qualify for a vast majority of fellowship funding, and there are very few other forms of funding to support my career. My job has become increasingly unstable over time because the career progression path for postdocs is so narrow in academia. I'm very passionate about my field of research; it's disheartening to see others progress further because they know how to 'play the game' of academia rather than actually being any good or care about the science itself."</p> <p>"There is a lack of progression and a feeling that one is somehow paradoxically stuck in a dead-end but highly unstable fixed-term world. The ideal would be a long-term route for research that does not require everyone to become a group leader."</p>
Increasingly limited funding/grant options	19%	<p>"I felt inadequate when deciding to put my family first for a period of 5 years. This decision closed the door on most fellowship applications as 'time since PhD' seems to be the most important metric for eligibility. I have no idea why this should be the case. I think it is wrong and discriminatory."</p> <p>"Although a senior postdoc, I am unable to be listed as a lead PI or CI on major grants despite being the lead writer and coordinator."</p>

		<p>"We become too expensive for grant applications. Negative academic culture views on long-term postdoc-ing and sometimes not eligible for career advancements e.g. some fellowships"</p>
No/limited pay progression	13%	<p>"Payment is not keeping up with our experience and expertise."</p> <p>"I don't feel the research pay scale is designed for people staying as a postdoc for more than a few years. I am expected to carry out a lot of the admin tasks which I don't feel should really be my responsibility."</p>
Impossible to show independent research outputs	13%	<p>"It is hard to show independence of research output - everything I do is "credited" to a PI as far as the department is concerned even though the novelty comes from me. I don't qualify to apply for my own funding."</p> <p>"You have all the doctoral and postdoc training and extensive research/policy experience (and the number of peer-review papers similar to lecturer/senior lecturers), but if you are not a lecturer or a grant holder research fellow, there is no independence in research."</p>
Caring about the research team / associated admin negatively affects solo progression	2% + often mentioned in other question fields and during interviews	<p>"My line manager did not see me as professor material as I am being too much of a TEAM player!"</p> <p>"You quickly become the 'go to person' which becomes a time-consuming role without any formal acknowledgement. Increasing managerial and administrative duties prevent you being able to prioritise your own career progression."</p>

Table 4. The negative outcomes experienced by long-term researchers, split into themes and with representative quotes taken from the survey or interviews

Theme (positive outcomes experienced by LTR)	Percentage of LTRs (5+ years' experience) identifying with theme	Indicative quotes
Freedom to focus time and energy on high-quality research	41%	<p>"I have developed serious practical and theoretical experience with complex experimental data types, protocols and computational analyses, especially in bioinformatics and biostatistics. To be realistic, research groups cannot really be expected to perform certain types of tasks rigorously and correctly while relying only on PhD students and PIs... Experienced staff (postdocs and not only) have a key role in preventing a LOT of issues with reproducibility, bad analysis and poor-quality research, and in consolidating knowledge to a standard that can be effectively transferred and built upon."</p> <p>"Personally, I find research to be rewarding. As an experienced postdoc I am an asset to the research community. I am more independent, flexible and able to produce better quality research and written work than those with less experience."</p>
Source of deep knowledge, experience and continuity: skills expert	32%	<p>"I think that my technical skills in research far exceed almost all of my more senior colleagues. I think that skills such as mine could help progress my field."</p> <p>"I have gained a wide range of skills and experiences which contribute positively to the research group I am working in. I have developed a broad network of colleagues in different disciplines. More opportunity to publish papers on work from previous roles."</p>
Source of deep knowledge, experience and continuity: Being an information bridge (through time, across a wide research area, at Imperial)		<p>"You have more confidence, knowledge, contacts, and insight into how the university works so are able to gain support for experiments (working more efficiently and effectively). You have more collaborations which you built respect with, can also help work move forward."</p> <p>"You can carry a long-term research project without having to switch focus."</p> <p>"Output is maximal due to deep knowledge and expertise. Progress on long-term projects that are technically challenging, continuity in techniques and projects to help train junior staff and students, and long-term project memory to help others."</p> <p>"Allowing the lab to have a good continuity of skills despite high turnover of other more junior staff - which is very much more efficient and productive for the lab."</p> <p>"I've experienced many different labs and research areas"</p>
Focus on collaboration, team cohesion, supporting others	18%	<p>"PIs with large numbers of new postdocs/students absolutely do not have the time to drill down into raw data and analysis techniques with them, simply because there are not enough hours in the day. Having experienced researchers available helps fill this gap and goes a long way towards ensuring scientific rigor"</p> <p>"I have had more opportunities to fine tune my ability to supervise students, who value being supervised in the lab by some who has had more than 5 years of bench-based experience specifically in the field of research that they are"</p>

		<p>committing their time to. I have also needed more than 5 years of experience to master skills needed to navigate the politics around my field of research and structure of academic research”</p> <p>“Experienced postdocs are key in the development of research groups as we help PIs with multiple tasks while providing stability in the group and retention of knowledge (PhDs and postdocs normally come and go and the specific technical skills are sometimes lost due to the lack of overlap between posts).”</p>
Avoid negatives associated with an academic career pathway	16%	<p>“I can keep doing research and the best parts of an academic job without having the responsibilities of a group leader and without needing to spend all my time applying for grants.”</p> <p>“Not being a faculty member means I can avoid a potentially huge teaching and marking load.”</p> <p>“I avoid the academic admin associated with moving up the hierarchy. More focus on hands-on research.”</p>
Independence, confidence and autonomy	15%	<p>“I get to experience a variability of projects, working autonomously. I have mid-level responsibility and can be a role-model and help develop junior colleagues.”</p> <p>“I am acquiring more independence and experiences that are useful to work for multidisciplinary projects.”</p> <p>“I enjoy the work and am now highly skilled at what I do. I have quite a lot of independence. I have a lot of experience and knowledge to share with students.”</p>
Flexibility (family, work/life balance)	10%	<p>“My family life is most important thing, which means I have not been able to apply for some opportunities as they involved too much time away or even moving, which were not an option for me with kids in school.”</p> <p>“It is very important for me with to have time with my young child and also manage mental health issues.”</p> <p>“Flexibility of working hours great for life with two kids”</p> <p>“Being a LTR gives time to increase your experience and to start a family before you have an increase in people management as a group leader.”</p> <p>“My life is more important thanv my work - so I will always make sure that wherever I am employed allows flexible working and that I am able to engage in the other things that fulfil me in my life.”</p>
Opportunity to work across breadth of research, supporting multidisciplinary enquiry	7%	<p>“Working as a postdoc for this time has allowed me to work on a range of projects and gain focussed experience in a few adjacent fields. This in turn is now feeding back into my research and enabling a more multidisciplinary approach as well as insights that perhaps my junior colleagues may miss.”</p> <p>“I was lucky enough to work with 5 different research groups within college and many more external research teams through working on multiple grants at any one time.”</p>

Table 5. The positive outcomes experienced by long-term researchers, split into themes and with representative quotes taken from the survey or interviews



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