

## Wellcome Sanger Institute

1. The Wellcome Sanger Institute uses genome sequences to advance the understanding of the biology of humans and pathogens to improve human health. We use science at scale to tackle the most challenging global health research questions and have a portfolio of internationally important research from discovery to translational science with a globally unrivalled depth and breadth of genomic capability.
2. We sit at the heart of a global network of science, with research programs focused on cancer, infection genomics, and human and cellular genomics. We lead and support international consortia and our highly talented staff come from over 50 countries.
3. With the launch of Genomics England, the Chief Medical Officer's report, Generation Genome and the Life Science's Industrial Strategy, genomics has become a national priority. The recent announcement that the Sanger Institute will be a substantive site for the Health Data Research UK, in partnership with EMBL-EBI and the University of Cambridge, and our successful bid for the UK Biobank vanguard sequencing project has placed the institute in a critical position for delivery of the Government's vision for the health and wealth of the UK.
4. The UK's exit from the EU represents a real threat to UK science and to the Sanger Institute. 38% of the Institute's talented are from the EEA, and another 28% come from the rest of world. Recruitment of bioinformaticians and software developers is particularly challenging and has been further impacted by the Tier 2 visa caps.
5. There is a national and international shortage of software developers across all sectors. Software developers are critical for the Sanger Institute as they design the tools needed to use and analyse the vast quantity of data we collect and generate from our DNA sequencing activities.
6. Science is not a zero sum game; we will either succeed together or fail together. Negotiations on immigration should be approached with the view that restrictions on scientists' movement damage both sides, and that free movement is of reciprocal benefit.

## Recommendations:

7. The current immigration system, with its lengthy, at times restricted and complex visa requirements, must not be transposed onto EEA nationals, once we leave the EU.
8. The Sanger Institute supports freedom of movement for all scientists across the EEA. At minimum, individuals from the EEA who hold job offers or grants or fellowships with a UK sponsor should be allowed to move here with their families without restriction for as long as they are in post or for the duration of their funding.
9. Students from both the EEA and rest of world undertaking graduate qualifications in the UK should be given a period to remain in the UK after they have completed their studies to allow them to look for work. There is already a pilot scheme for rest of world graduates looking at this issue. We support its expansion. Fees for any visa should be reduced or waived if they are in possession of a UK degree.
10. Software developers should be placed on the shortage occupation list for all sectors.
11. Short-term mobility should be encouraged and supported with light-touch checks for academics holding posts in other countries to allow them to visit UK institutions for periods of days to a few months. This should include students and those undertaking internships.
12. Salary thresholds should be removed from immigration requirements for all those involved within the scientific research sector, particularly those addressing national skills shortages.

13. All immigration caps should be abolished especially where applicants are applying through priority Standard Occupational Classification (SoC) codes and shortage occupations routes.
14. Students should not be included in the immigration numbers.

## Conditions in a deal with Europe

15. The early stages of academic and research careers, typically involve fixed term contracts and an expectation that young scientists will move between research groups gaining specialist expertise. It is common for early career scientists to move country for at least one post. At the Sanger Institute 53% of our faculty are from the UK, 30% are from the EEA and 17% are from the rest of world. This is mirrored across the Institute with 33% of all staff coming from outside the UK (Annex 1). The majority of our faculty and many of our staff have worked outside the UK for a period of time.
16. In addition to fixed-term contracts which typically last 3-5 years, scientists at the Sanger Institute often travel for short periods of time to visit collaborators and share skills and expertise. In addition, scientists from the EU and around the world visit the Institute (Case Study 1). The time spent at the Institute may last days to months but often results in meaningful professional relationships that last years and extend beyond the initial project for which they came. These relationships and networks are vital to the science that the Sanger Institute does, which in turn supports the UK as a global leader in genomics.
17. A deal with Europe must ensure that scientists are able to move between the EU and the UK with minimum cost and bureaucracy in a speedy manner. Projects are often fixed-term, typically lasting 3-5 years. Delays recruiting staff to these projects simply means valuable science does not get done. This is a scientific loss, but where funding has come from a UK research council and objectives have not been fulfilled it is also a loss to the UK tax payer (Case Study 2).
18. The Sanger Institute uses different approaches to recruitment which must be taken account of, in common with other UK academic organisations. A deal with Europe and any visa system should recognise:
  - a. Recruitment to advertised posts – this is initiated by the Sanger Institute and openly advertised
  - b. Relocation of research and innovation talent – typically led by named individuals who hold grants or fellowships. Individuals are named in the grant or fellowship and move to the UK to take up the post.
  - c. Temporary migration - short visits (up to 6 months), temporary work (1-2 years) and formal study (at the Sanger Institute these are graduate students).
19. Ensuring talented staff and students are able to remain in the country and move smoothly into new roles and between organisations at the end of fixed term contracts or a period of study is important. The UK is desperately short of software developers, and organisations like the Sanger Institute are in constant need. We often dedicate significant resource to recruitment and/or development of talented staff and students. If those individuals are not able to remain after the end of the project it is the UK who loses. A deal with Europe should seek to ensure that the talent we have invested in can remain in the UK.

## Career needs of Scientists

20. As described above, scientists at the early stages of their career are on fixed-term contracts and it is not unusual to move countries at this stage. By moving around, early career scientists build the professional networks and collaborations that support their science and increase their capacity and capabilities to tackle challenging issues. Making sure UK scientists can return with their families or encouraging international scientists to remain should be a priority.

21. At all stages of research careers moves are planned up to 18 months or longer in advance, to account for funding applications, moving personnel and setting up new facilities. This is a significant time and financial commitment for many scientists and UK organisations; adding in burdensome visa requirements can add further pressures to the point where these planned moves fail.
22. Postdoctoral research fellows are highly qualified and experienced individuals who on top of their research will typically be mentoring and training students and supervising other projects. The Academy of Medical Science recently reported that for every £1 spent on medical research in the UK there was an annual return of 25p in perpetuity<sup>1</sup>. It seems obvious that supporting talented researchers to come to the UK, regardless of where they come from, how much they earn or how long they stay, delivers enormous benefits to this country. Having a diversity of talent only benefits UK health and wealth.
23. Immigration requirements need to support the movement of these early career researchers and should reflect the training and the skills of these scientists, rather than focussing on their salary. Academic salaries are not high, particularly for early career researchers. At the Sanger Institute postdoctoral research fellows are paid £31,000 - £39,000 which puts them in the region of the current Tier 2 visa threshold. Such arbitrary thresholds show no recognition of the skills needs of this country and risk preventing highly qualified and talented from coming to the UK.
24. Those already in possession of grants, research funding or fellowships prior to applying to move to the UK should be fast-tracked through the immigration system, with minimal costs applied. More senior researchers bringing teams with them should also be fast-tracked through the immigration system.

### Negotiation with the EU-27

25. The ability of UK scientists to move around the EU is enormously beneficial for the UK. As described above, movement is an integral part of scientific training and the UK benefits as much from European and international scientists coming here as it does from sending its scientists outside the UK. Any rules on movement and migration must be reciprocal, just as the benefits of movement in science are reciprocal.
26. Negotiations with the EU-27 should not be seen as a win or lose situation. Science is not a zero-sum game and ultimately science is done best when it is done together. Historically, science has kept dialogue open between countries where formal diplomacy has failed. At a time when relationships between us and our European allies may be feeling the strain, science should be viewed and used as a tool for building friendship and re-establishing trust. It is in our interests to welcome EU-27 citizens and their families who want to come here to work with our universities, research institutes and companies.

### Timescale for clarity

27. Existing issues with tier 2 visa caps and the highly publicised “hostile environment” are damaging UK science. As the result of a freedom of information request from CaSE it was recently revealed that over 1,600 scientists and engineers were denied visas in the space of 4 months from December 2017<sup>2</sup>. The Sanger Institute has been directly impacted by these visa caps<sup>3</sup> (Case Study 2). We can only describe these caps as damaging, deeply counterproductive and in no way in the national interest.
28. These problems have harmed the reputation of the UK as a good place to do science. The Sanger Institute has seen a significant and sustained drop in applications for our PhD program from EU countries since the referendum and, despite being in desperate need, we have had to stop considering applications from candidates who would require a Tier 2 visas under the Software Developer SoC Code. These candidates are

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<sup>1</sup> <https://acmedsci.ac.uk/more/news/outstanding-return-on-investment-in-medical-research>

<sup>2</sup> <http://www.bbc.co.uk/news/science-environment-44113324>

<sup>3</sup> <https://www.thetimes.co.uk/edition/business/theresa-mays-visa-cap-hurts-employers-and-her-brexit-vision-sdmrwkqb9>

often highly talented and desperately needed but are rejected because even where we successfully obtain a visa for that individual there is a high risk of significant expense and delay. We cannot afford to be in the same position with EU citizens who are already expressing concerns about life in the UK. It is imperative that this situation is not replicated with EU scientists.

29. It is not possible to undo the damage already done to the UK's reputation, but a clear resolution on movement between the UK and the EU-27/EEA cannot be done too quickly. An agreement that allows straightforward movement of scientists and their families will send a clear message that the UK is, and wishes to continue to be, a global scientific leader.

### **Concluding Comments**

30. The UK is a global leader in life sciences and the Government has outlined a vision for the future prosperity of the UK that relies heavily on its life science industry. Within this genomics is singled out as a particular priority.
31. The science done at the Sanger Institute has been formative in making the UK a global heavyweight in genomics. The Institute's science has, since its inception, been an international endeavour with staff and collaborations from around the world. The Institute, and its international staff, is now an important partner in delivering the UK Government's Industrial Strategy.
32. The UK cannot afford to be viewed as grudgingly allowing scientists to come to this country. Instead we should be embracing international scientists with open arms and using our science to build powerful relationships with our friends and keep diplomatic doors open with others. The UK's science thrives on collaboration and diversity. Preventing talented scientists, software developers and bioinformaticians from coming to this country only damages our science and undermines the vision the Government has laid out for the life sciences<sup>4</sup>.
33. The Sanger Institute supports freedom of movement for EEA scientists and their families, the removal of caps and salary thresholds for visas for scientists and their families and removing students from immigration figures.

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<sup>4</sup> <https://www.gov.uk/government/publications/life-sciences-industrial-strategy>

## Case Studies

### Case Study 1 Long-Term Sanger Institute-KEMRI collaboration

AA is molecular biologist based at the KEMRI-Wellcome Trust Research Programme in Kilifi, Kenya; a Wellcome-funded health research unit in Kenya dedicated to improving health decisions in Africa and creating future scientific leaders.

In 2014 AA received a Wellcome training fellowship, which was sponsored by a member of faculty at the Sanger Institute. He spent four months at the Sanger Institute studying the parasite which causes malaria, specifically looking at how it interacts with itself and how it interacts with the human host. The research was published in an open access journal and led to AA applying for, and being awarded, another 5 year fellowship which is also being sponsored by the Sanger Institute. As part of the fellowship AA will spend time at the Institute to use equipment for his research that is not available at KEMRI-Wellcome Trust. This collaboration has obvious benefits for AA and KEMRI-Wellcome Trust but has also been beneficial for the Sanger Institute. The work has resulted in publications and has provided us with a lasting and productive relationship with a leading research institute in Africa. It has also lead to other joint projects and including the co-supervision of an MPhil student by both organisations which means returns on research investment for this country as well as supporting research on the ground to tackle one of the world's most pernicious diseases.

### Case Study 2 – Failed Recruitment of a Software Developer

Last year, the Sanger Institute started a recruitment for a software developer for a time sensitive large-scale collaborative database project, critical to supporting our infection genomics programme, which specialises in monitoring the global spread of infectious diseases and understanding the genetics of parasitic infections.

After a lengthy recruitment process, a software developer from India was identified who met the job requirements but they required a visa. Despite meeting the extensive criteria under the immigration rules for this post, our application for a Certificate of Sponsorship was refused twice on the grounds that the immigration cap had been met. In each instance we were simply advised to submit a new application for the next month.

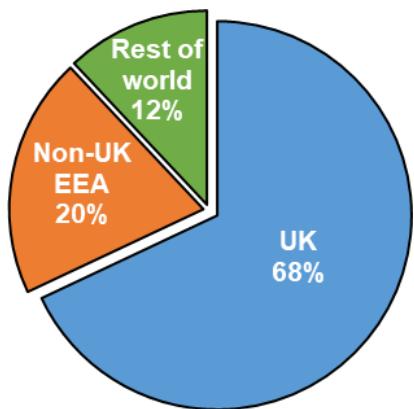
Unfortunately, we were unable to submit a third time due to the 6 month recruitment time-limit within the immigration criteria having expired. Further to this, with no end to the immigration cap being lifted in sight, delays and impact to the progress of the project, in addition to the impact to the candidate and their own career we had no choice but to withdraw the offer. It took 1.5 years to fill this post, and the result was that parts of the planned project were not done.

The Group Leader involved in this recruitment stated that in his opinion the Institute's reputation had been damaged. This project was part of an international collaboration and the failure to recruit and the subsequent impact on delivery affected our partners as well as us.

## Annex 1

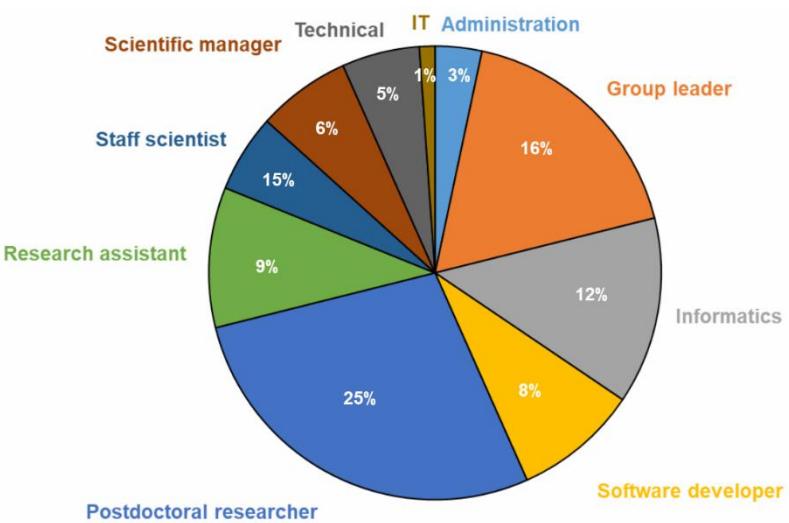
### The Sanger Institute workforce

Sanger employs over 1000 scientists, support staff and PhD students. A **third** of our staff are non-UK citizens and, of these, 62% are EEA citizens.



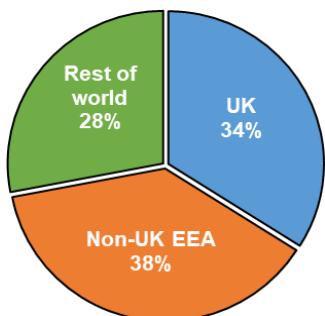
### EEA citizens have a wide range of skills

EEA staff are employed across diverse job roles. The majority of EEA employees would be classed as 'highly skilled' workers.



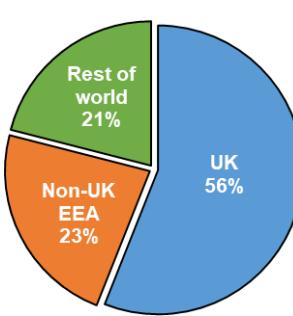
### Highly-skilled workers

Over a **third** of our staff classified as highly-skilled EEA citizens.



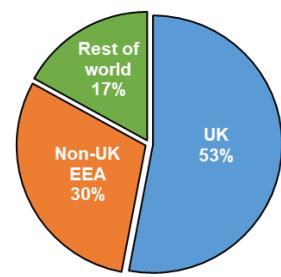
### Bioinformaticians

The chronic shortage of bioinformaticians in the UK is a threat to the UK genomics sector. Almost a **quarter** of our bioinformaticians are EEA citizens.



### Group leaders

Sanger's group leaders drive the Institute's vision, imagination and intellectual energy. A **third** of our group leaders are EEA citizens and many of them will have worked and gained experience and knowledge from all over the world.



### Fewer new EEA employees since the Brexit referendum

Some candidates have cited Brexit as a reason for declining employment offers at Sanger. Twice the number of EEA nationals resigned from Sanger in the 6-months post-Brexit referendum compared to the 6-months preceding the referendum.

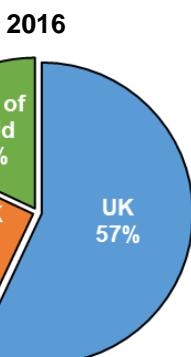
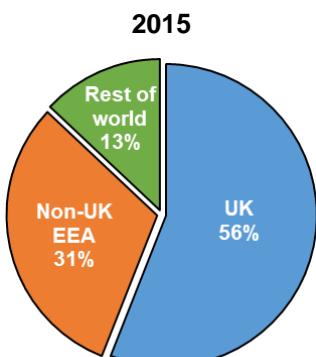


Chart : Citizenship of new Sanger employees

### Fewer applications from prospective EU PhD students

In 2017 and 2018, there was a 40% reduction in applications from prospective EU PhD students compared to 2016.

