Royal Society of Chemistry (RSC) Response to the Call for Evidence on People and skills in UK science, technology, engineering and mathematics

With around 45,000 members and a knowledge business that spans the globe, the RSC is š Z h < [• professional body for chemical scientists, supporting and representing our members and b1r492y(s

The UK immigration system must be flexible, low cost, and light-touch, as well as adopting a welcoming tone and attitude, so that UK science can continue to thrive and attract talent from all over the world. However, current UK migration routes for people with STEM skills have inherent problems. The Post-Study Work route is valuable, particularly for retaining researchers post doctorate, but does not allow for individuals to go home before applying. The High Potential Individual visa has overly narrow eligibility based on untransparent university league tables and does not recognise the ‰ ‰ o] future potential.

The UK visas needed to recruit globally, including the Global Talent visa and the Innovator and Scale-Up visa, are expensive. Analysis on visa costs carried out in 2019 by the Royal Society[1] shows that the UK has some of the highest upfront costs in the world for immigrating scientists and their sponsors. In October 2020, the Immigration Health Surcharge, the biggest component of the upfront costs, increased by more than 50%, further widening the gap between the UK and other leading science nations. These costs are the most significant barrier as many individuals, especially if accompanied by their family, cannot afford them. They are also prohibitive to SMEs, with half of all small businesses saying they cannot afford visa sponsorship.[2] This stops innovative SMEs bringing in international STEM talent • ‰] š š Z P } À Œ v u v š [• Œ Z š } best and brightest Œ š] v P š Z

Evidence is emerging that it has become harder to retain and attract international talent in chemistry research. Prof Roel Dullens, previously at Oxford Chemistry, moved his entire research group to Nijmegen once UK association to Horizon Europe looked unlikely.[3] We hear the field of chemical physics/physical chemistry is seeing some talented early career scientists move away from the UK. Some UK chemists have also reported increased difficulties in recruiting post-doctoral researchers.

Q2 STEM Skills

In common with many other STEM and other fields, digital and sustainability skills and knowledge are becoming increasingly important in the chemical sciences. š Z Z ^ [• Digital futures report[4] shows the growing role and importance of digital chemistry skills. In the biopharmaceutical sector, a significant employer of chemists and chemistry skills, recent research shows a need for more candidates with digital skills. It also sets out the need to address specialist chemistry skills gaps in for

example formulation science, computational chemistry (including chemoinformatics), pharmacokinetic/pharmacodynamics modelling and engineering in manufacturing.[5] Additionally, practising chemists working in academia and industry report a gap [illegible] skills and knowledge and those needed for green jobs now and in the future. 94% of those who identified a gap said it is at least moderately significant.[6]

Both postgraduate and technical and vocational chemistry education need to equip students for business careers. Postgraduate education must contribute to broad skills

Recruitment and retention of chemistry teachers is more challenging than for many other subjects, in part because teacher salaries do not compare favourably to the earning potential of STEM graduates[14]. Financial incentives have a role to play in attracting and retaining chemistry teachers[15], µ š ' } À Œ v u v š • • Z } µ o Œ P µ o Œ o Ç À o µ š š Z] Œ W o r k l o a d ' s] À v • • the most cited reason for teachers leaving the profession[16].

interventions[27]. We welcome UKRI's research and Innovation [• announcement that it will raise its minimum stipend from 1 October to reflect the cost of living increases and call on Government and funders to consider urgently how to support PhD students and other researchers most impacted by the cost of living crisis.

Issues with the culture of research in the UK have been highlighted by several organisations in the research sector in recent years[28]. d Z P } À Œ v u v š [• Z ˜ ‰ } ‰ o v µ o š µ Œ • š Œ many of these issues, and delivery of this strategy should remain a priority.

RSC research into the structural barriers to inclusion of women and minoritised ethnicity scientists identified an unsupportive academic culture, unequal access to funding and narrow definitions of success as systemic barriers to the retention and progression of these groups. Key actions to tackle these barriers are:

i. Encourage and support filling gaps in evidence, monitoring and reporting t we need greater transparency to enable the sector to learn lessons and share best practice.
ii. Address inequalities in funding, reward and recognition t there are continued inequalities in salary and reward across academia and industry, and funding systems present structural barriers for underrepresented groups. The RSC has conducted research and suggested actions for funding bodies, with broader applicability in some cases, for example the need to review and expand definitions and measures of success and excellence in STEM.
iii. Provide greater flexibility and adjustments t these are key factors in enabling equal participation for those from underrepresented groups. Existing support provisions, such as Access to Work and] • o ^ š µ v š • [o o } Á v U • Z } µ o Œ À] Á š } v • µ Œ v and fit for purpose.
iv. Increase accountability; eliminate bias, bullying and harassment; and build cultures of belonging t creating diverse, inclusive and welcoming STEM workplaces requires intervention at all levels. The RSC has conducted extensive research here and developed recommendations to tackle exclusionary behaviour, increase accountability for bullying and harassment, address implicit bias and mitigate its ((š • U v Œ u } À Œ Œ] Œ • š } µ v Œ Œ ‰ Œ • v š P Œ } µ % of belonging
v. Tackle inequalities in education t as set out in our response to Q3, long-standing barriers to access to high quality science education need to be addressed to ensure that every student, whatever their background, receives an excellent chemistry education.
vi. Shift the burden t S 0 g 000] T exc

[4] Digital futures, Royal Society of