

Research Strengths ?



‘Strengths’ can be interpreted in different ways and can vary on a continuum that emphasises **inputs (levels of competitive funding) to **outputs** (efficiency and impact of research)**

Inputs

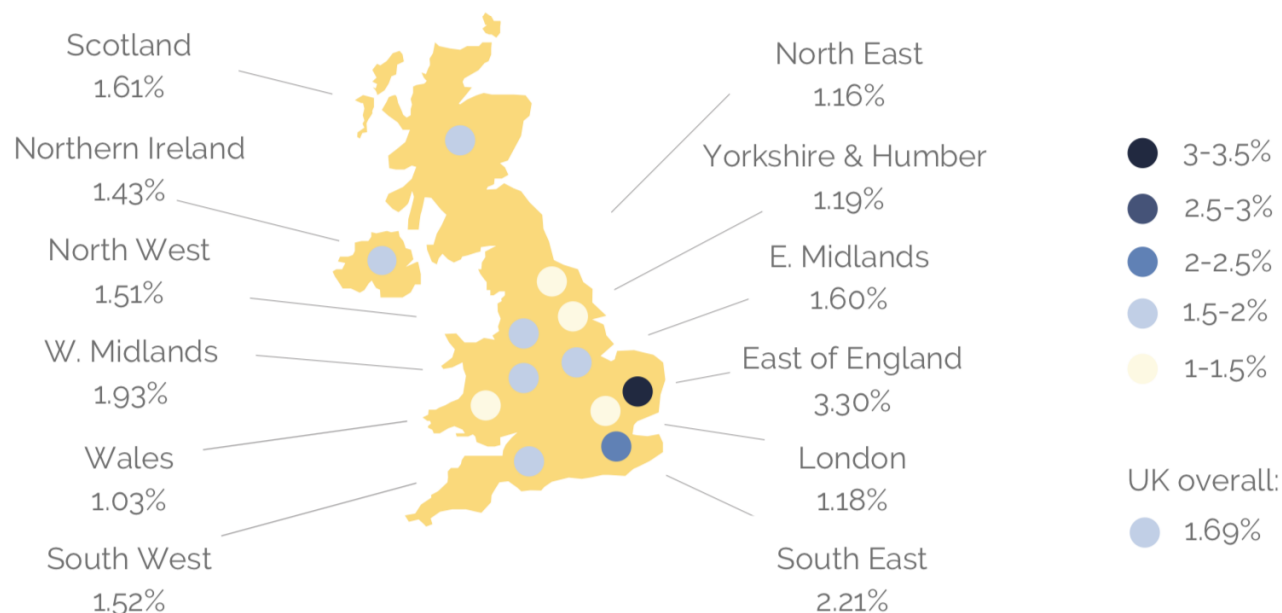


Figure 2: Regional R&D expenditure as a % of GDP, NUTS region, 2017 (4)

NUTS1 Region	RC Spend FY 2018-19 £M	RC Funding Spent per Research Organisation £	RC Spend as % of local GVA	RC Spend per capita £
East Midlands	102	387,479	0.10%	21
East of England	277	531,307	0.18%	44
London	469	353,222	0.11%	52
North East	104	623,157	0.20%	39
North West	265	639,642	0.16%	36
Northern Ireland	25	267,378	0.06%	13
Scotland	248	677,505	0.18%	45
South East	407	500,234	0.15%	44
South West	163	386,433	0.12%	29
Wales	29	211,413	0.05%	9
West Midlands	128	410,054	0.10%	22
Yorkshire and the Humber	191	678,916	0.16%	35

Table 1: Research Council Spend NUTS 1 FY2018-19

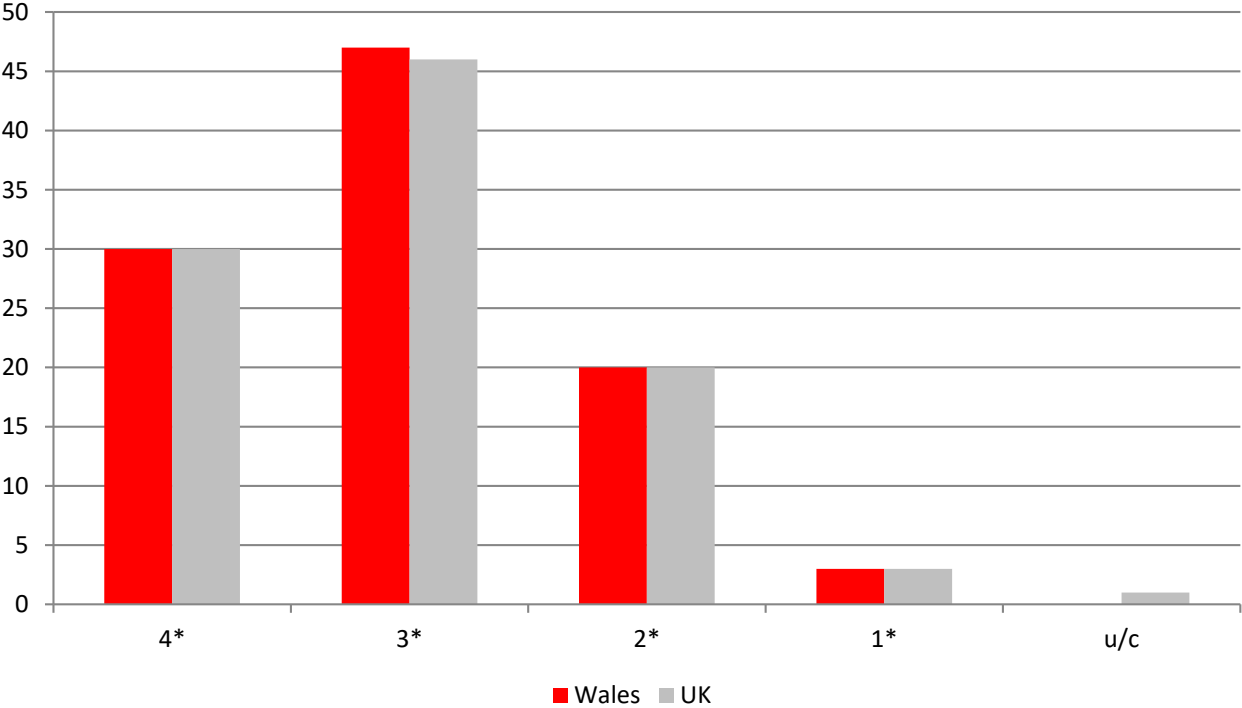


Outputs : Published Research Performance

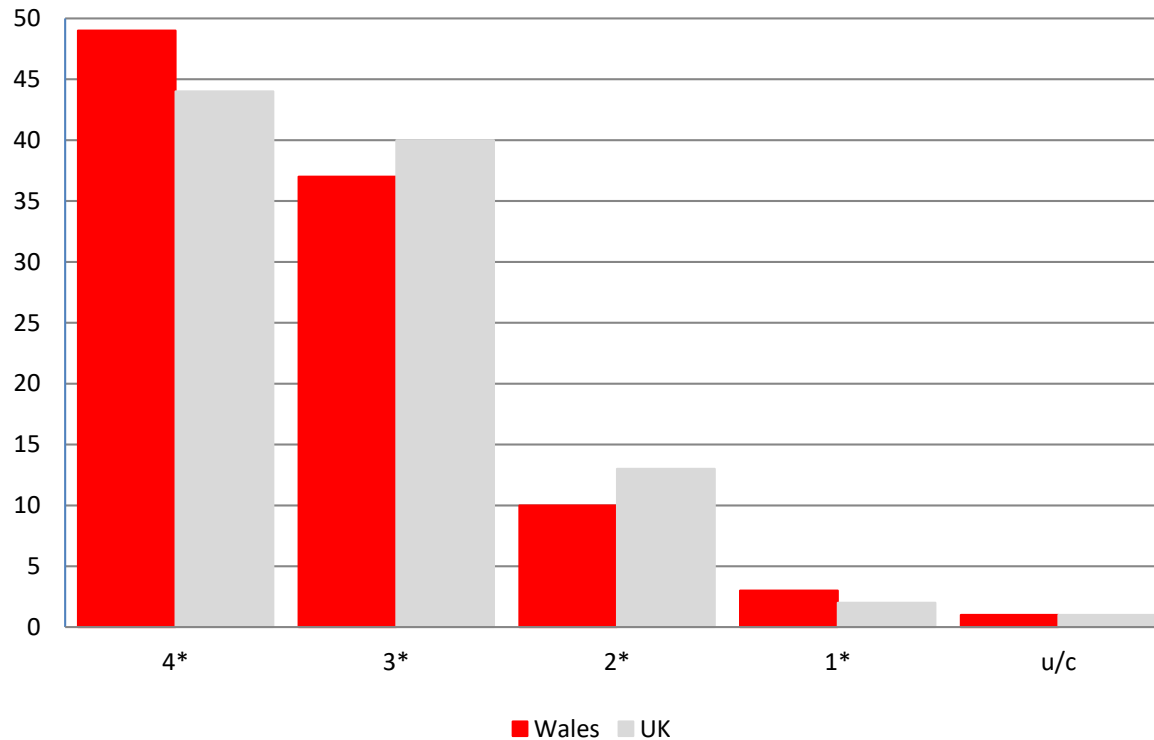
Wales's contributes to the UK's world-leading UK research base

Wales is the most efficient UK nation for converting relatively low levels of research income into highly impactful and innovative research

2014 REF - Wales



2014 - REF Impact Wales



UK Research Landscape

November 2020

UK accounts for

- 2.5% of the world's R&D funding
- 4% of the world's researchers,
- over 6% of the world's research articles
- nearly 14% of the most highly cited articles.

Wales Research Landscape

Wales accounts for

- 0.05% of the world's R&D funding,
- 0.1% of the world's researchers but
- 0.3% of the world's research articles,
- 0.5% of global citations
- 0.5% of the most highly cited articles.





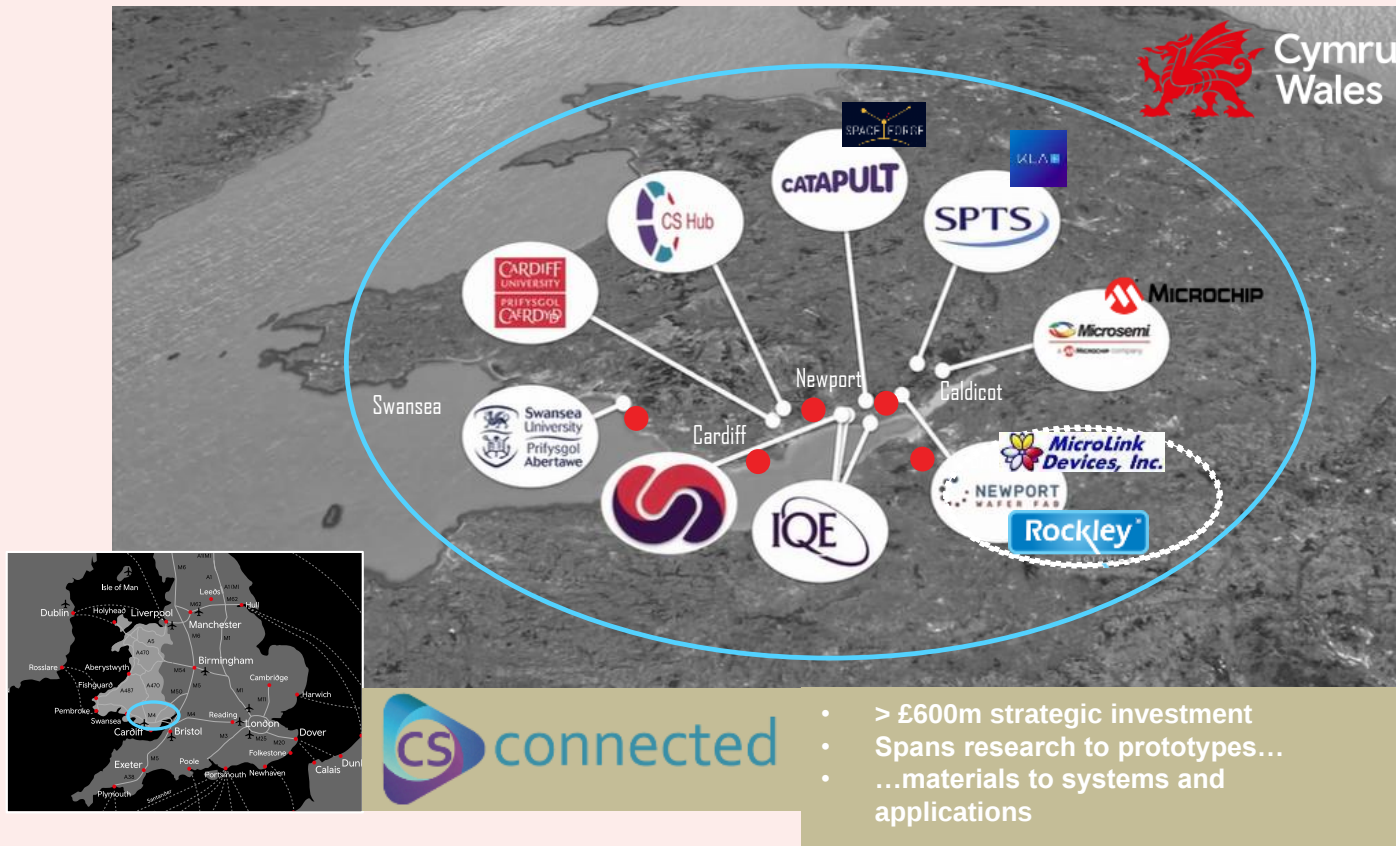
Some take home messages..

- **Welsh researchers (comprising 3.4% of all UK) account for 4% of all UK publications**
- **Rising from an FWCI of 1.5 in 2010, Wales achieved an FWCI of 1.8 by 2018 (80% more citations than global average), the second highest of all UK nations.**
- **Wales' publication share of the top 5% most highly cited publications is twice that of the global average.**
- **NATURAL SCIENCE and MEDICAL AND HEALTH SCIENCE are the most prolific subject areas accounting for 54% and 39% of all research output**
- **Between 2010 and 2018, Wales increased its share of internationally co-authored publications by more than 15%, rising to almost 60%.**
- ***From 2010 to 2017, the number of Welsh researchers only grew by 1.7%, the lowest growth among UK nations***
- ***Wales' spend on R&D accounts for only 1% of its GDP -lower than all other UK nations.***

Key Centres of Translational Research



Growing The Compound Semiconductor Cluster in Wales



<https://www.cardiffcapitalregion.wales/news-post/the-welsh-compound-semiconductor-cluster-repeating-history-or-reshaping-the-world/>



Research & Collaboration



Wafer
Production



Chip
Processing



Packaging
specialists



Producer of
manufacturing
equipment



High Volume
silicon photonics



Wireless
communication
s devices

A complete supply chain in a concentrated geographical area...



£75m

Institute for
Compound
Semiconductors



£30m

Centre for
Integrative
Semiconductor
Materials



£42m

Compound
Semiconductor
Centre



£50m

Compound
Semiconductor
Applications
Catapult



£38m

Foundry and
Research
Centre

...backed by leading research capability and collaborative practice

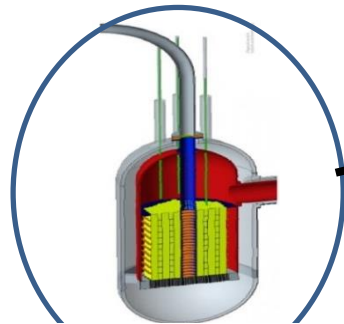


Nuclear Opportunities – North Wales leading the UK in new nuclear technology and deployment

Wylfa – potential
deployments of
large or small
reactors, SMRs,
STEP



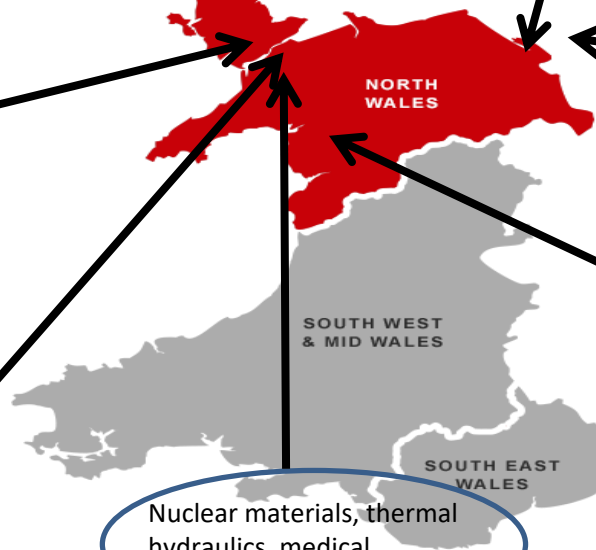
Deeside Advanced
Manufacturing Research
Institute - including nuclear



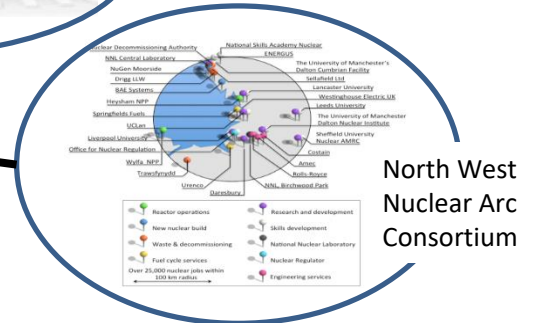
Menai Science Park M-SPARC, UK National
Nuclear Thermal Hydraulics Facility, up to
£40M (£20M WG)



Bangor University - Nuclear
Futures Institute, £6M Ser
Cymru investment in R&D



Nuclear materials, thermal
hydraulics, medical
radioisotopes research



Trawsfynydd – Cwmni Egino
development company, SMR,
AMR, Medical Radioisotopes and
Research Reactor

- **Nuclear – cogeneration & Net Zero** (<https://www.foundation.org.uk/Blog/2020/Co-generation-Nuclear-Energy%E2%80%99s-untapped-potential>)
- **Need for UK to secure a sustainable supply of future medical radioisotopes** (<https://www.foundation.org.uk/Blog/2020/Need-for-UK-to-secure-a-sustainable-supply-of-futu>)

A Global Centre of Rail Excellence in Wales



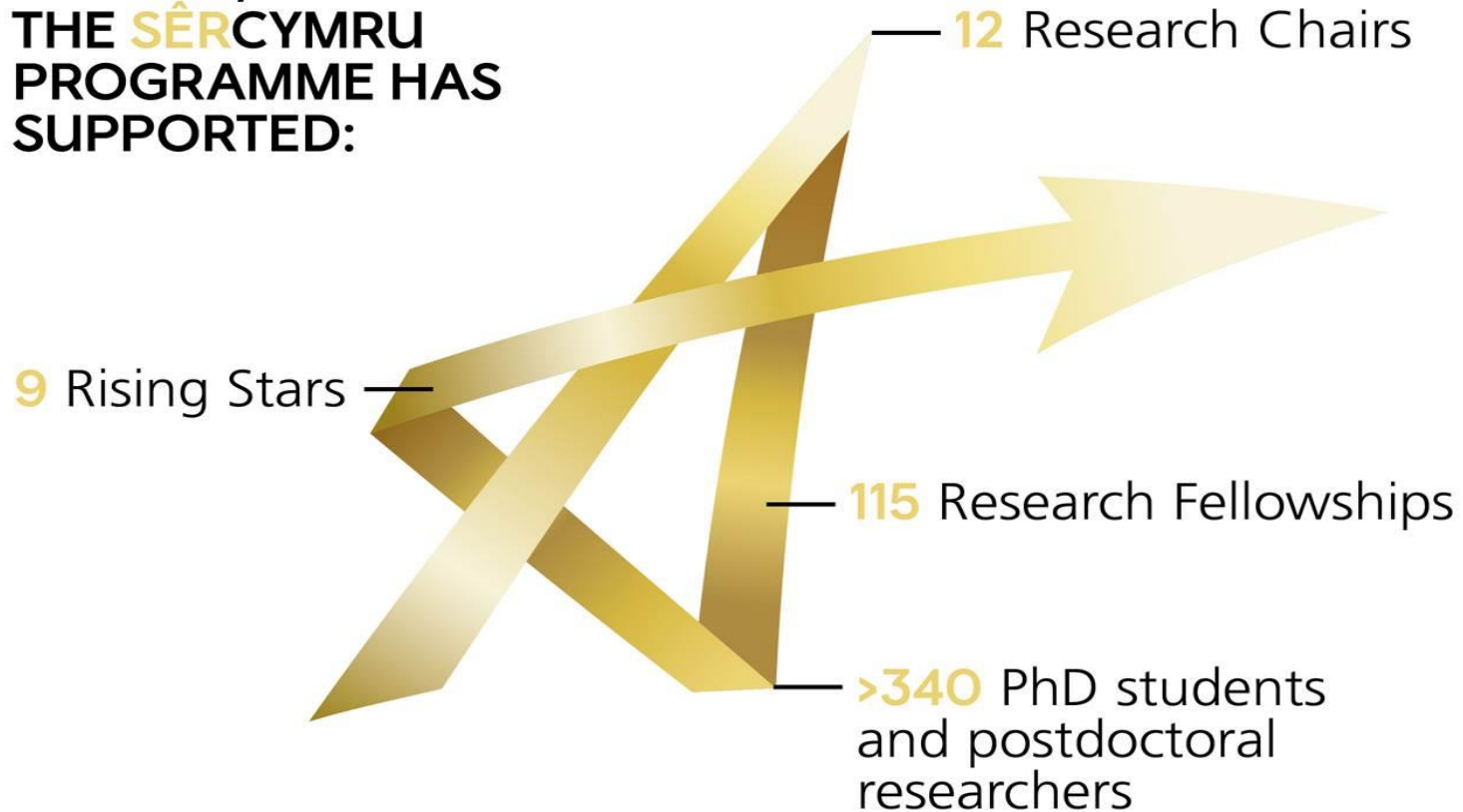
- Plans for the construction of a world class rail testing facility on a former opencast mining site at the head of the **Dulais** and **Tawe Valleys** progressing with the announcement of **£50 million** Welsh Government support for the delivery of the **Global Centre of Rail Excellence (GCRE)**.
- The train, rail infrastructure and technology testing facility, will provide unique capability in the UK and Europe, to support innovation in the UK and international rail industry, including the testing of cutting-edge, green technologies
- To deliver the first phase of the project, the Welsh Government has confirmed a **£50 million** capital funding loan to Powys Council.
- Earlier this month the UK Government pledged up to **£30 million** funding to the pioneering project in the Spring Budget.

The South Wales Industrial Cluster (SWIC) deployment project, led by Costain, has been granted phase two funding of nearly **£20m (from UKRI)** following successful completion of Phase One assessments looking at decarbonisation schemes and the infrastructure required for a hydrogen economy in South Wales.

Phase Two of the project involves engineering studies to explore the routes to decarbonisation, including the use and production of a hydrogen supply, carbon capture usage and storage (CCUS) and CO₂ shipping from South Wales which would be the first CO₂ shipping industry in the whole of the UK, and would create an entire new industry for the region



TO DATE,
THE **SÊRCYMRU**
PROGRAMME HAS
SUPPORTED:



- By 2021, the Programme will have received approximately £100m from: Welsh Government, HEFCW, Welsh HEIs, European Regional Development Fund (via WEFO), and European Commission Horizon 2020 funding
- allowed more than 500 researchers from 29 different countries the opportunity to work in Wales.
- The programme has generated more than £180m in research grant income and helped Wales punch above its research income in terms of research outputs, efficiency and



Ser Cymru Rapid Covid Programme call (Summer 2020)

Launched June 2020 -open to applications by Welsh universities.
Deadline 1st July 2020 – research to be completed by Spring 2021.
117 proposals received - total value of approximately £8m.
Reviewed by the Sêr Cymru Independent Evaluation Panel
August/Sept- *Grants Awarded 39 research projects targeting the effects of Covid with a total cost of £5.4M (WG £2.9M; HEI £2.2M & Other £300k).*

Research topics included :

- Developing point of care genetic testing
- Wastewater monitoring
- Tackling social inequalities in the use of face coverings
- Patient-specific lung models for assessing clinical interventions and Investigating the environmental stability of the virus



Technology for Creating a Sustainable Safe Environment Post COVID-19 (TCSSE-19) – **Professor Andrew Barron (SU)**

Wastewater Monitoring and Environmental Surveillance of SARS-CoV-2/COVID-19 Using Metaviromic Approaches
Andrew Weightman (CU)

COVID-19 public experiences in Wales: A longitudinal mixed-methods study of attitudes, beliefs, and behaviour in response to the coronavirus pandemic
Rhiannon Phillips (CMU)

Intelligent Exercise Practitioner for Community-dwelling Stroke Survivors
Otar Akanyeti (AU)

Application of artificial intelligence to ultrasound to diagnose and monitor COVID related acute lung damage and longer-term pulmonary complications
Prof Keir Lewis (SU)

Assay development and high-throughput screening for the identification of novel small molecules with a potential to reduce the NEAT1_2-mediated cytokine storm in COVID-19
Tania Shelkovernikova (CU)

Future opportunities/ challenges



Roadmap : R&D Place Strategy (June 2021)

New UK innovation strategy (June 2021)

UKRI CSR outcome?

UKSPF?

ARIA ?

UKG reduction in ODA funding

UK Roadmap and 'levelling up agenda' for R&D

- Wales's share of all UKRI funding is 2.8% and has remained at this level for years – compared with Scotland's share of 13%.
- Latest figures on R&D spending, provided by the UK Government show that the R&D performed divided by population means that per head of the population, Wales receives 58% less of the funding in England
- **WG representation to UK Government : BEIS, UKRI & PAG**

Wales needs more research capacity if it is win greater competitive UK funding to help build a strong and sustainable science base that can contribute to the UK Government's ambition for the UK to be a global science superpower.

This will require long-term investment in research capacity and a willingness by the UK to include and value regional knowledge and expertise as part of the co-production of UK place levelling up policies.

(See FST blog back: <https://www.foundation.org.uk/Blog/2020/Levelling-up-innovation-and-research-investment-fo>).

The UK Shared Prosperity Fund should help to grow research and innovation capacity across the UK

05 March 2021

The UK Shared Prosperity Fund (UKSPF) is expected to replace European Structural and Investment Funds (ESIF) later in 2021 with the objective of levelling up and creating opportunity for people and places across the UK.

The Government has committed to match the total amount received through ESIF at the national level while the UK was a member of the EU at around £1.5 billion a year.

Asks:

- The Government should rapidly deliver the Shared Prosperity Fund and ensure that it continues to support research and innovation activities to avoid a funding cliff edge that leads to a loss of these activities and capabilities across all the UK's nations and regions. Once lost, these will take time and investment to rebuild.
- The fund must complement other new and existing initiatives at a national and devolved level which use data to target local strengths and excellence in research and build on different regions' comparative advantages including infrastructure and skills.



Download



[UK Shared Prosperity Fund](#)

PDF, 129.

WG asks:

- **A formal commitment to tackling longstanding R&D regional disparities as part of the R&D Places strategy.**
- **Greater partnership engagement between DAs and UKRI to include co-creation, governance and co-delivery of policy.**
- **A Regional Opportunities Fund to supplement the "Strength in Places" fund**
- **Greater /fairer representation and input on UKRI decision-making bodies**
- **UK Gov should replace EU structural funding for regional development (UKSPF)**

- Wales punches above its research income in terms of research outputs, efficiency and impact.
- Despite its relative size, Wales's universities/ industry produce a disproportionately higher share of the world's published academic articles, global citations and highly cited articles
- With only 2% of the total UK spend on research and development(R&D), Wales's research base is a national asset, delivering economic, social, cultural and health benefits for the nation and others around the world.

