

RCUK GCRF Call for Evidence

For more information visit

<http://www.rcuk.ac.uk/funding/gcrf/gcrf-call-for-evidence/>

Question 8

Thinking about the broader development landscape, in which of these high level interdisciplinary challenge areas might GCRF research add most value? Please select one or more:

- Health
- Clean energy
- Sustainable agriculture
- Conflict & humanitarian action
- Foundations of inclusive growth
- Resilient systems
- Mass migration & refugee crises
- None of these

Our response

1. In our view the high level interdisciplinary areas in which GCRF research might add most value are:
 - Health
 - Clean energy
 - Sustainable agriculture
2. We recommend including Water and Resource Efficiency/Circular Economy either as challenge themes or as explicit cross-cutting themes. Evidence is given in Question 11.
3. For each challenge we provide evidence below of:
 - the role of research in delivering solutions to the challenge
 - UK research capability in that challenge area and
 - existing links between UK research and DAC List countries.

We are aware that our evidence is not comprehensive, being limited to the lens of chemistry and the many subjects across science and engineering with which it interfaces. Our intention is that concrete examples and evidence will nevertheless be useful in informing and supporting decisions.

4. In the clarification of the challenges there is an opportunity to highlight the role of underpinning research areas such as materials, physical and analytical sciences, and catalysis in contributing to a range of challenge themes.
5. We understand that delivering solutions to global challenges will require an interdisciplinary effort and we are committed to supporting the chemistry community in contributing to their full potential to this effort. Our own [global challenges programme](#) and international activities such as the [Pan-African Chemistry Network](#) are designed with this objective in mind.
6. We would welcome the opportunity to support RCUK and the delivery partners as you develop these challenges and the calls that follow from them, sharing our own work on global challenges and international engagement as well as linking with members of the research community. Please contact [Dr Deirdre Black](#), Science Manager.

Question 11

Should RCUK consider including any of the UN Global Goals as challenge areas? Please select those that apply:

- Affordable & clean energy
- No poverty
- Clean water & sanitation
- Climate action
- Life below water
- Decent work & economic growth
- Gender equality
- Good health & well-being
- Industry, innovation & infrastructure
- Life on land
- Partnerships for the goals
- Peace, justice & strong institutions
- Quality education
- Reduced inequalities
- Responsible consumption & production
- Sustainable cities & communities
- Zero hunger

Our response

We suggest including the following UN Global Goals as additional GCRF Challenge areas:

- Water, which overlaps with Clean water & sanitation
- Resource efficiency & circular economy, which overlaps with Responsible consumption & production

We note that several of the already proposed challenge areas overlap to some extent with the UN Global Goals, for example:

- Clean energy overlaps with Affordable & clean energy
- Health overlaps with Good health & well-being
- Sustainable agriculture overlaps with Zero hunger
- Resilient systems overlaps with Climate action

Information about interdisciplinary global challenges and Royal Society of Chemistry programmes to support chemists in developing solutions to the following:

- [Energy](#)
- [Health](#)
- [Food](#)
- [Climate change](#)
- [Water](#)

Evidence for Question 8

Health

Health: Evidence of role of research in delivering solutions to challenge

Tackling Drug-Resistant Infections Globally: Final Report and Recommendations, HM Government, 2016, http://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf

Review on AMR: Tackling a Global Crisis, HM Government, 2016, <http://amr-review.org/sites/default/files/Report-52.15.pdf>

Type 1 Diabetes Research Roadmap, JDRF, 2015, <https://jdrf.org.uk/wp-content/uploads/2015/10/JDRF-Research-Roadmap-interactive.pdf>

The 100000 genomes project protocol, Genomics England, 2015, https://www.genomicsengland.co.uk/wp-content/uploads/2015/03/GenomicEnglandProtocol_030315_v8.pdf

The UK strategy for rare diseases, HM Government Department of Health, 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260562/UK_Strategy_for_Rare_Diseases.pdf

Technology Touching Life, RSC consultation response, 2014, <http://www.rsc.org/globalassets/04-campaigning-outreach/policy/research-innovation/ttl-rsc-submission.pdf>

UK Regenerative Medicine Platform Annual Report 2015, BBSRC, EPSRC, MRC, 2015, <http://www.ukrmp.org.uk/wp-content/uploads/2015/11/UKRMPAnnualReport20151.pdf>

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Medical Engineering Initiative. Opportunities and Challenges: Advancing and Translating Knowledge and Technology Workshop Report, Medical Engineering Institute, 2015 <http://welmecl.leeds.ac.uk/studies/medical-engineering-initiative-opportunities-and-challenges-report/>

The importance of engineering and physical sciences research to health and life sciences, EPSRC commissioned review, 2014, <https://www.epsrc.ac.uk/newsevents/pubs/the-importance-of-engineering-and-physical-sciences-research-to-health-and-life-sciences/>

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Report of the Medical Imaging Technology Working Group, EPSRC and MRC, 2012, <https://www.epsrc.ac.uk/newsevents/pubs/report-of-the-medical-imaging-technology-working-group/>

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Taking Stock of Regenerative Medicine in the United Kingdom, HM UK Government Report, 2011, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32459/11-1056-taking-stock-of-regenerative-medicine.pdf

Strategy for UK Life Sciences, Department of Business, Innovation and Skills, 2011,
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32457/11-1429-strategy-for-uk-life-sciences.pdf

Regenerative Medicine Forward Look, BBSRC, EPSRC, MRC and Innovate UK, 2001,
<https://www.mrc.ac.uk/documents/pdf/regenerative-medicine-forward-look/>

Healthcare Innovation in the UK, Royal Society of Chemistry Position Paper,
<http://www.rsc.org/globalassets/04-campaigning-outreach/tackling-the-worlds-challenges/health/uk-healthcare-innovation.pdf>

Report of the Medical Imaging Technology Working Group, EPSRC, 2012,
<https://www.epsrc.ac.uk/newsevents/pubs/report-of-the-medical-imaging-technology-working-group/>

A non-animal technologies roadmap for the UK- Advancing Predictive Biology, TSB, 2015,
http://nc3rs.org.uk/sites/default/files/documents/NonAnimalTechCO082_RYE_4_nrfinal2.pdf

Stratified Medicine in the UK Vision and Roadmap, TSB, 2011,
<https://connect.innovateuk.org/documents/2843120/3724280/Stratified+Medicines+Roadmap.pdf/fbb39848-282e-4619-a960-51e3a16ab893>

POSTnote: Antimicrobial Resistance in the Environment, Parliamentary Office of Science and Technology, 2013, <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-446/>

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<http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-451/>

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<http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-416>

Health: Evidence of UK research capability

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EPSRC and MRC CDT in Biomedical Imaging,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/biomedicalimaging/>

EPSRC and MRC CDT in Optical Medical Imaging,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/opticalmedicalimagingtrainingthenextgenerationofscientificentrepreneursinhealthcaretechnologies/>

EPSRC and MRC CDT in Systems Approaches to Biomedical Science,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/systemsapproachestobiomedicalscience/>

EPSRC and MRC Centre for Doctoral Training in Regenerative Medicine,
<http://www.regenmedcdt.manchester.ac.uk/>

EPSRC CDT in Advanced Therapeutics & Nanomedicines,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/advancedtherapeuticsnanomedicines/>

EPSRC CDT in Medical Devices and Health Technologies, <http://www.strath.ac.uk/simd/dtc/>

EPSRC CDT in Neurotechnology for Life and Health,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/neurotechnologyforlifeandhealth/>

EPSRC CDT in Physical Sciences for Health,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/physicalsciencesforhealthsciph4health/>

EPSRC CDT in Physical Sciences Innovation in Chemical Biology for Bioindustry and Healthcare, <https://www.epsrc.ac.uk/skills/students/centres/profiles/physicalsciencesinnovationinchemicalbiologyforbioindustryandhealthcare/>

EPSRC CDT in Synthesis for Biology and Medicine, <https://www.epsrc.ac.uk/skills/students/centres/profiles/synthesisforbiologyandmedicine/>

EPSRC CDT in Tissue Engineering and Regenerative Medicine, <https://www.epsrc.ac.uk/skills/students/centres/profiles/tissueengineeringandregenerativemedicineinnovationinmedicalandbiologicalengineering/>

Health: Evidence of existing links between UK research and DAC List Countries

Guiding treatment and leading advocacy for podoconiosis, a common but highly neglected tropical disease, University of Sussex, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=41523>

Diagnosing malaria using magneto-optic sensors, University of Exeter, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=36623>

Improving the Impact of Malaria Prevention Activities, University of Liverpool, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=6596>

Meeting the diagnostic needs in resource-limited settings, University of Cambridge, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=29899>

Transmission and control of parasitic zoonoses, University of Salford, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=19412>

Controlling the hepatitis B virus in Africa and preventing unnecessary expenditure, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=41455>

Developing a new approach to malaria prevention in children: seasonal malaria chemoprevention in West Africa, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=41452>

Evaluating drugs and devising strategies for reducing malaria transmission, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=41446>

Eliminating trypanosome carriage in Ugandan cattle prevents sleeping sickness in humans, stimulating the formation of "Stamp Out Sleeping Sickness (SoS)" a Public Private Partnership that is eliminating the disease from Uganda, University of Edinburgh, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=23917>

Development of international policy and strategies for prevention, control and elimination of rabies, University of Glasgow, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=35860>

Exploitation of virus-like particles for vaccinology and the development of safe efficacious Bluetongue virus vaccine, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=43607>

Improving methodologies for the detection and identification of malaria parasites in human blood, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=43688>

Intermittent preventive treatment for malaria control, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=42580>

Optimising the Prevention and management of HIV associated cryptococcal meningitis, St George's University of London, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=44065>

Reducing the overdiagnosis of malaria and improving case management of fever in East and West Africa, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=43532>

Screening for TB in people living with HIV, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=43528>

Rotavirus Vaccine Evaluation and Introduction in Africa, London School of Hygiene & Tropical Medicine, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=28863>

Influencing global policy on antiretroviral treatment priorities, University College London, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=22422>

Increasing the yield of medically important proteins in plants by suppression of RNA silencing, University of East Anglia, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=3401>

Therapeutic Drug Monitoring for HIV drugs, University of Liverpool, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=3859>

Development of life-saving control strategies to eliminate rabies in Bali, University of Glasgow, REF submission, 2014, <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=40344>

UK-India Workshop on Tackling the Emergence of Antimicrobial Resistance: Increasing Awareness and Facilitating Research Networks, British Council Newton Fund Researcher Links Workshop, 2016, <http://ab-openlab.csir.res.in/amrworkshop/>

Scotland Chikwawa Health Initiative, Collaboration between University of Strathclyde and University of Malawi, ongoing, <https://scotlandchikwawahealthinitiative.wordpress.com/>

Clean energy

Clean energy: Evidence of role of research in delivering solutions to challenge

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Solar Fuels and Artificial Photosynthesis, Royal Society of Chemistry, 2012, <http://www.rsc.org/globalassets/04-campaigning-outreach/policy/research-policy/global-challenges/solar-fuels-2012.pdf>

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<http://www.nirab.org.uk/media/6234/nirab-annual-report-2015.pdf>

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Efficient Utilization of Elements (5th CS3 2013 White Paper), Chemical Sciences and Society Symposium (CS3), 2013, <https://www.epsrc.ac.uk/files/newsevents/news/5th-cs3-2013-efficient-utilization-of-elements-16-19-sep-2013/>

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Prospectus report: Industrial Energy Demand , Research Councils UK Energy Programme, 2013,
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Clean energy: Evidence of UK research capability

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EPSRC CDT in Decarbonisation of the Built Environment, <https://www.epsrc.ac.uk/skills/students/centres/profiles/decarbonisationofthebuiltenvironment/>

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EPSRC CDT in Future Power Networks and Smart Grids,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/futurepowernetworksandsmartgrids/>

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<https://www.epsrc.ac.uk/skills/students/centres/profiles/newandsustainablephotovoltaics/>

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EPSRC CDT in Nuclear Fission,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/nuclearfissionnextgenerationnuclear/>

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<https://www.epsrc.ac.uk/skills/students/centres/profiles/renewableenergymarinestructures/>

EPSRC CDT in Sensor Technologies and Applications,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/sensortechnologiesandapplications/>

EPSRC CDT in Sustainable Materials and Manufacturing,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/sustainablematerialsandmanufacturingengd/>

EPSRC CDT in the Science and Technology of Fusion Energy,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/thescienceandtechnologyoffusionenergy/>

EPSRC CDT in Wind and Marine Energy Systems,
<https://www.epsrc.ac.uk/skills/students/centres/profiles/windandmarineenergysystems/>

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EPSRC SUPERGEN SuperSolar Research Hub,
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Clean Energy: Evidence of existing links between UK research and DAC List Countries

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Sustainable agriculture

Sustainable agriculture: Evidence of the role of research in delivering solutions to challenge

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