

Climate change: it's on us too



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The effects of climate change driven by human activity are now part of the daily news cycle, and time is running out for decisive action.

According to the latest Intergovernmental Panel on Climate Change (IPCC) [report](#)¹, “There is a rapidly closing window of opportunity to secure a livable and sustainable future for all”. As scientists who seek to understand the inner workings of the human body, we recognize that planetary health and human wellbeing are inextricably linked. Science can help to tackle climate change-related problems, with measures such as treatment and prevention strategies to combat diseases associated with environmental change, cleaner energy sources, and improved agricultural processes; however, scientific progress is unpredictable, and relying on nonexistent technologies is unwise. We need to address the research enterprise’s sizable environmental impact and secure a hopeful future.

Research laboratories contribute to energy and water use, emissions and waste generation. Some of this can be mitigated by shifts in practices and culture. Changes to airflow, heating systems and climate-smart buildings have helped Rockefeller University achieve a 31% reduction in carbon emissions². Setting freezers at -70 rather than -80°C can translate to energy savings of 35%, and closing fume hoods and turning off unused lights and equipment also markedly reduces energy expenditure³. Having received early scientific training in Brazil, authors T.L.C. and D.M. recall practices borne of economic need that are now applied for environmental necessity, from washing pipette tips to optimizing the use of lab animals. Sustainable lab practices, such as washing and reusing plastic materials and replacing single-use plastic with glass, should be broadly adopted⁴.

To encourage sustainable practices, educational programs should be integrated into scientific training. At Rockefeller, sustainability training increased participation in plastic

recycling and improved lab purchasing patterns. Raising awareness has also transferred sustainability practices from the lab to the home – for example, by increased use of non-disposable food ware, composting, and setting indoor temperatures higher in the summer and colder in the winter.

Optimizing scientific travel – by grouping engagements, choosing eco-friendly travel options, and virtual attendance – can help to reduce our carbon footprint. However, we are mindful that reducing travel will effect academics differently based on location and country income levels. A sad irony is that although most high-quality scientific research takes place in high-income countries, the bulk of its negative environmental effect is felt in low- and middle-income countries. Moreover, these communities will probably be the last to benefit from the mitigating effects of scientific research, including technologies and next-generation vaccines that could protect against infections that arise from habitat destruction. The COVID-19 pandemic was an example of the challenges to providing an equitable response to global emergencies.

Lack of awareness, pressure to prioritize short-term results, and frequent publication in prestigious journals are among the barriers to individual action. Therefore, it is essential that we shift our shared expectations of responsible practices towards valuing long-term solutions and sustainability. The current pursuit of scientific progress should not compromise our future.

We call on policymakers, funders and institutions to implement regulations that promote sustainable practices and prioritize research projects that incorporate them. As science is largely publicly funded, governments have the opportunity to direct these efforts. Indeed, the US Government has created a Climate Action Plan⁵ that prioritizes sustainable grant policies, and “[bringing efficiency to research](#)” grants have been initiated to encourage sustainability in research.

Financial incentives for sustainable research can have far-reaching consequences.

Requiring grants to be used in an environmentally sustainable manner could stimulate the development of eco-friendly supplies and equipment. It could also promote the expansion of existing voluntary systems such as the [ACT environmental impact factor labels](#) promoted by My Green Lab. At the institutional level, this could encourage recycling programs, sustainable purchasing, equipment-sharing plans and carbon-neutrality pledges. Researchers should be encouraged to consider the environmental impact of their work and adopt sustainable practices such as sharing resources, minimizing waste and publishing detailed scientific methods to improve reproducibility.

The benefits of sustainable science are vast, and it is important to remember that every bit of it helps. Together, we can rise to the challenge of finding innovative solutions to global problems. By reducing the environmental impact of research, we will be in a better position to contribute to a more sustainable future.

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References

- Intergovernmental Panel on Climate Change. www.ipcc.ch/report/ar6/syr (2023).
- The Rockefeller University. <https://go.nature.com/3CmAgX5> (18 April 2013).
- Climate@MaxPerutzLabs. <https://go.nature.com/45VGGku> (accessed 1 March 2023).
- Winter, T. et al. *EMBO Rep.* **24**, e56683 (2023).
- US Department of Health & Human Services. <https://go.nature.com/460QrHa> (2021).

Competing interests

The authors declare no competing interests.