

“The Physics of Life Roadmap”

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(Michelle Peckham – stand-in)

The Physics of Life roadmap (commissioned by UKRI) provides the opportunity for the PoL community to articulate progress, identify opportunities and support future strategy and innovation for UK Physics of Life research. It's important you have your say!



You can find out more about the roadmap here

<https://www.physicsoflife.org.uk/physics-of-life-roadmap.html>



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Who's it for?

Community – the roadmap will be publicised and delivered as part of the Physics of Life conference in Harrogate, 2025. The roadmap will act as a point of reference for current and future opportunities.

Funders – UKRI, Wellcome and other funders to highlight reasons to fund PoL research.

IOP Institute of Physics

Physics of Life 2025

24–27 MARCH 2025
HARROGATE CONVENTION CENTRE,
HARROGATE, UK



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What's it for?

The Physics of Life roadmap will be used to:

- Inform the Physics of Life research community and wider stakeholders of the opportunities and potential of Physics of Life (in its entirety). In doing so, it may identify unmet needs (e.g. skills or opportunities for more effective working at this interface)
- Position Physics of Life in relation to other key activities. For example, there may be some activities where Physics of Life leadership is required and others, where the Physics of Life community should seek to increase engagement in activities led by others.
- Raise awareness of relevant stakeholders, including research communities, who could help shape future research questions
- Be a resource for funders to inform research strategy by contributing towards the understanding of the importance and potential impact of Physics of Life research and the key opportunities that it presents in the short, medium and long term.



Aims

1. Survey, and engage with, the UK physics of life research community, and relevant stakeholders, to review UK research strengths and opportunities in this area of research (to include case studies).
2. Synthesise and publish a summary of the Physics of Life research community's view of research challenges and opportunities, along with an assessment of the significance and potential benefits of these challenges and opportunities.
3. Articulate UK strengths for Physics of Life research in an international context and identify key opportunities for development in this space for the next 5, 15 and 25 years.
4. Review the impact of PoLNET on the research community and assess how training needs might develop over the coming years.

Why Now?

- The PoLNET3 grant ends in March 2025. Additional funding received from UKRI between March 2024 and 2025 is being used to fund this roadmap alongside the [PoL PDRA call](#).
- The PoL SPF fund (£33M) will be completed by March 2025.
- It's important momentum created from Physics of Life network(s) (PoLNET1- PoLNET3) and from grants funded by the PoL SPF isn't lost.
- It is therefore timely and important to highlight to funders what the strengths of the Physics of Life community are and where the community envisages priority areas/UK strengths, which may highlight important investment areas.

Who's involved?

- The Physics of Life community (ECRs, researchers, learned institutions, industry) - to ensure a broad range of voices are incorporated into the written roadmap. This will involve collecting data, surveying the community and collecting information from community workshops and meetings.
- Physics of Life Roadmap 2023 Working Group (WG) (see below) - to provide written contributions on key aspects and expertise for the roadmap report.
- UKRI and Wellcome - to help define the remit of the review and act as critical friends to provide guidance on the process for developing this roadmap.
- [Physics of Life Steering Group](#) - to provide comment and review of roadmap.



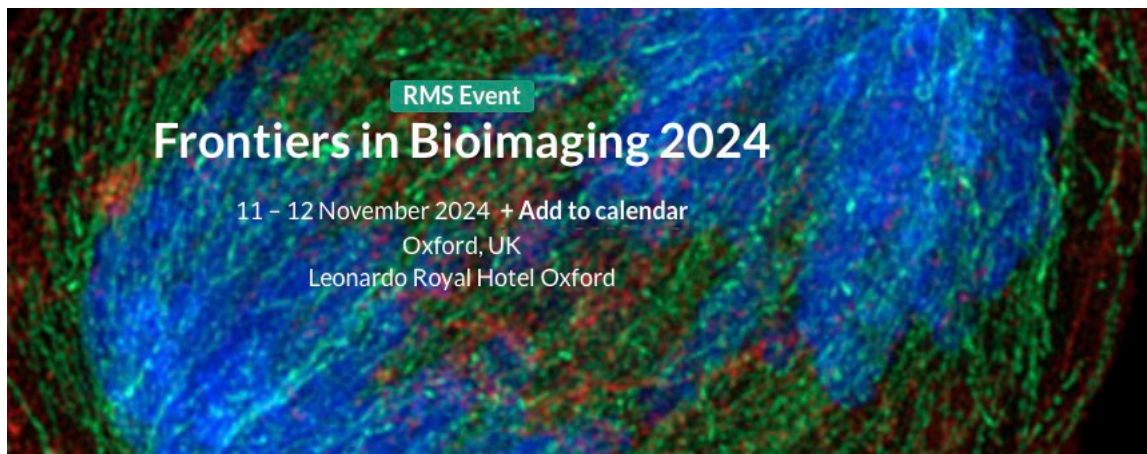
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Community Survey: The Physics of Life created a community survey which requested community input. The deadline to complete this has now passed, but we will continue to review any incoming thoughts. Please take the time to ensure your voice is represented by completing the short 10 minute survey, which can be found here: <https://forms.office.com/e/s8CXn3HfKr>

Theme Survey: Based on the community survey data and together with analysis of recently funded research, high-impact articles, and transformative data, the PoL Roadmap working group created draft descriptions of seven of the most disruptive active and emerging areas in UK Physics of Life research (see section below on 'Draft Roadmap Themes for Community Review' or word document located [here](#)).

The draft descriptions and examples within the seven broad areas should not be treated as exhaustive or exclusive, since we are still in the draft consultation phase. We would like to invite the whole UK PoL researcher community to feed back into these descriptions via a final 5-10 minute consultation survey which will remain open until August 15. Please see: <https://forms.office.com/r/WvPSumJARp>

Next community event is at Frontiers in Bioimaging (November, Oxford)



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3. Draft Roadmap Themes

The survey has helped identify Draft Roadmap Themes -

1: Simple models and systems to unlock complex molecular processes inside cells

Co-leads: Martin Howard, Alice Pyne, Petra Schuille & Nigel Goldenfield

2: Improving health, ageing and wellbeing - Co-Leads: Steve Smye & Olwyn Byron

3: Tackling infection - from the physics of microbial systems to host immunity - Co-Leads: Jamie Hobbs, Pietro Cicuta, & Mack Durham.

4: Physical principles of embryo and organ development to understand regenerative, ageing and disease processes - Co-Leads: Ben Simons, Michelle Peckham & Timothy Saunders.

5: Translating engineering biology across scales - Co-Leads: Lorna Dougan & Davide Michieletto

6: Physics of Life approaches that impact climate change and food security - Co-Leads: Mark Leake, Teuta Pilizota, Sonia Antoranz Contera, Luke Mackinder & Andrew Millar.

And Underpinning Approaches. (Mark, Michelle, Alice & Nigel)



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Reporting back at the Physics of Life 2025 Conference



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Watch the Webinar!

PoLNET Webinar

The screenshot shows a webinar slide titled "PoLNET Roadmap Webinar - 16 May 2024" with the subtitle "UNDERSTANDING THE Physics of Life" and "PoLNET history...". The slide features a timeline for "Phase 3 (2020 - 2023)" with five stages: Launch (of PoLNET3 and Rosetrees Trust Physics of Medicine), 4 workshops, 15 student project awards, Ongoing funding for summer schools, workshops, sandpits, pump priming, and Creation (of £33M for UKRI's Physics of Life SPF (now also with Wellcome)). Logos for the Engineering and Physical Sciences Research Council and the Biotechnology and Biological Sciences Research Council are visible. A QR code for the "roadmap survey" is in the top right. A video player interface shows a man speaking, with a "Share" button in the top right corner.

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https://youtu.be/y9C_KAZceL4