Route Exchange Network - Health and Science - How Employers are Supporting T Level Curriculums

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Brief introduction to cover:

- An introduction to UCL Biochemical Engineering and to VaxHub and our outreach/training programs
- The VaxHub T Level program with North Hertfordshire College

UCL Today

UCL	UCL Biochem Eng
9th in the World (QS)	**1st** UK department for biochemical engineering
4th in Europe & in the UK	**97%** 'world leading' / 'internationally excellent' activity
2nd in the UK for research power	**2nd** UK Faculty of Engineering for grant income

UCL Biochemical Engineering

We are the largest academic bioprocessing group globally

33 academic/teaching staff | > 300 UG/MSc/MRes students | > 100 PhD/EngD/PDRA/RFs

Our founding spirit is very much alive

We pride ourselves on our distinctive team-based ethos

Our research is world-leading with extensive academic and industry collaboration

>100 via 4 Research Hubs | >40 via industry PhD/EngD | 5 Strategic Partnerships

Our exceptional global links to industry and alumni support our teaching and students

> 30 industry experts feed into teaching activities

We have a long history of research-based teaching, CPD provision and enterprise activity

CPD: MBI and VISION programmes | Start-ups: x9

We have state-of-the-art facilities in the ACBE and MFL at UCL East

£35m pilot plant facilities in Bloomsbury | £4.5m Manufacturing Futures Lab in UCL East

VaxHub

£ 12 Million
7 Years

Manufacturing Hub for a sustainable future
VaxHub Sustainable: Vaccines for pandemic preparedness

- **Official Start:** 1st September 2023
- **Funder:** EPSRC
- **Co-Directors:**

Prof Martina Micheletti (UCL, Biochemical Engineering)
Prof Dame Sarah Gilbert (Pandemic Sciences Centre, Uni of Oxford)

Improving vaccine platforms

Enabling rapid and responsive process development and manufacture solutions

Optimising formulation for more efficient vaccine development

Conducting sustainability impact analysis and exploring circular economy practices

£ 10 Million
4.5 Years

Future Vaccine Manufacturing Hub
VaxHub Global: Vaccines for Low- and Middle-Income Countries

- **Official Start:** 1st September 2023
- **Funder:** DHSC and EPSRC
- **Co-Directors:**

Prof Martina Micheletti (UCL, Biochemical Engineering)
Dr Cath Green (CBF and Jenner Institute, Uni of Oxford)

Reducing high manufacturing expenses

Tackling critical issues in clinical implementation

Facilitating comprehension of complex regulatory frameworks

Enabling upskilling and formulating strategies for retaining talents

Hub Highlights

Research

- Core research at UCL, Oxford University and other HEIs
- Focus on 5 vaccine platform technologies: VLPs, viral vectors, subunit, mRNA and glycoconjugates

Platform Funding | Industry

£ 1m + 500 k Open Call
£ 1m + £1 m Feasibility Studies

- Open calls – funding for small projects
- Feasibility calls – funding for larger collaborative projects up to £100,000

Policy Impact

To ensure the hubs' research outputs translate into real world effects and can inform and shape policy to help address current and future global health challenges

Outreach Programmes

To actively engage with the wider community to:

- Reduce vaccine hesitancy
- Increase awareness of the role of biochemical engineers

Training

- Plans for development of technical and leadership training for our network partners
- Training programmes for Hub Early Career Researchers

Joint Network

Connecting 3**0+ companies**, from SMEs to larger pharma and institutions

- Facilitate vaccine co-development
- Share expertise and resources
- Create an engaged and diverse community

Public Engagement and Outreach

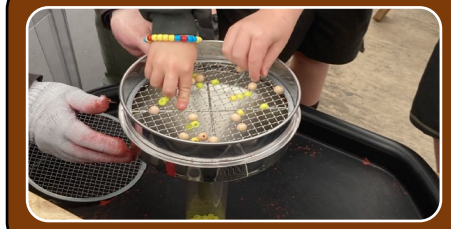
Priority areas

Vaccine Manufacturing Transparency

- Physical Processes & ingredients
- Sustainability
- Risks vs Benefits
- Profitability
- Trust

Vaccines and the Community

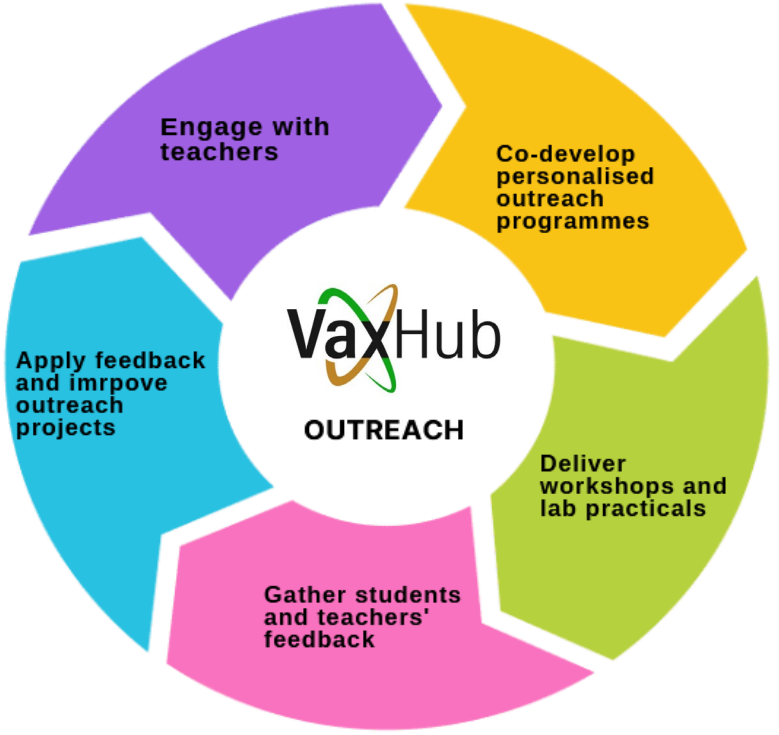
- Work with healthcare professionals
- Work with community leaders
- Vaccine delivery - What do people want?
- Policy maker involvement
- Equitable access to vaccines globally



Support VaxHub Members

- Provide new tools
- Train researchers
- Address reluctance to engage
- Improve measures of impact

Co-creation and co-development with schools



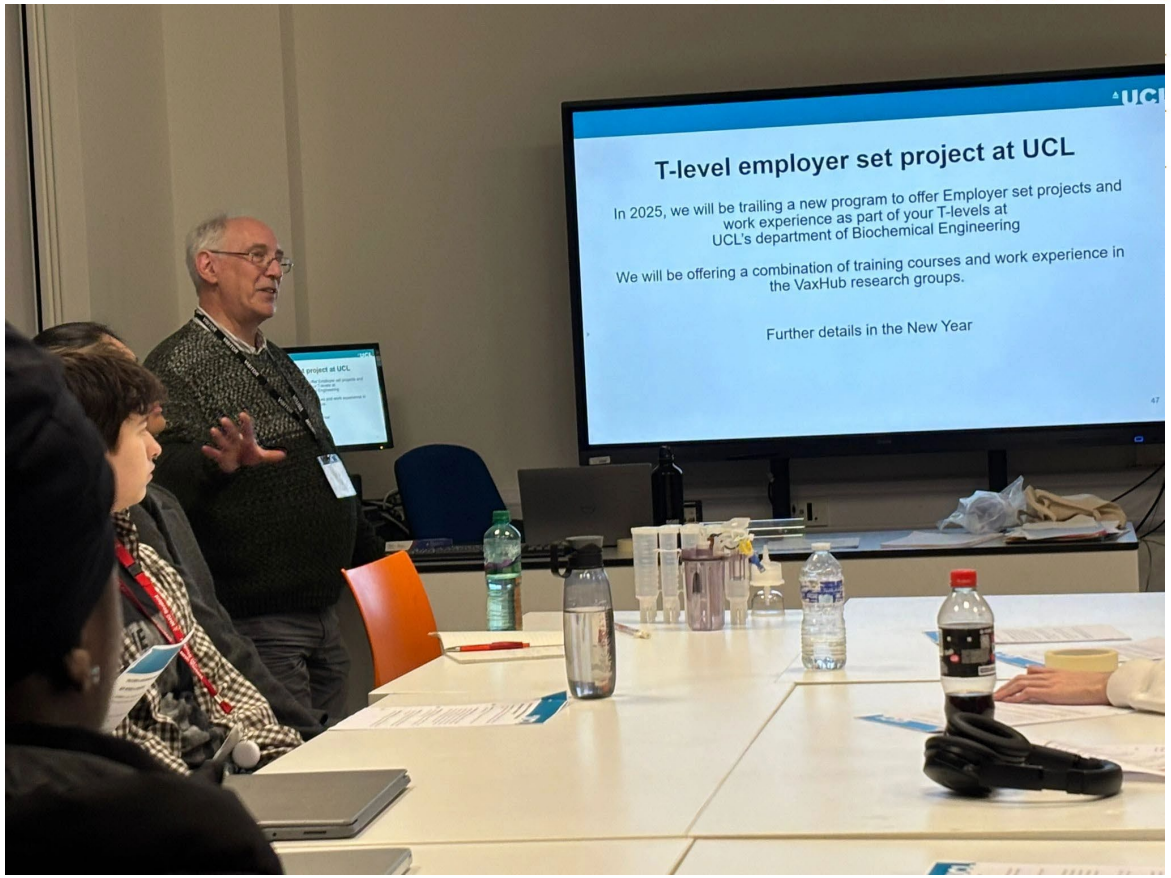
Multiple pathways available

CPD for science teachers	Vaccine and biochemical engineering talks	Career talks	Laboratory activities	Projects for school groups

Trial of T-Level placements with North Hertfordshire College

New for 2024 -25: Trial of T-Level placements with North Hertfordshire College

- T Levels are an alternative to A levels and apprenticeships, giving young people the technical and practical skills needed to be an asset in the workplace. They combine classroom learning with a substantial industry placement.
- With approximately 20% of the programme being spent on an Industry placement, T Levels give students a unique opportunity to help develop new talent in your industry, and get young people work-ready.



This moved us from extra-curricular to an active curriculum partner

How we made this work for 8 students

- This all happened over the period January – August 2025.
- We ran 2 half day sessions at NHC
- Resilience ran a 10-day course on cell culture to all students
- We ran a 10-day induction course to all students. Covering lab safety, risk assessment and management, principles of bioprocessing (USP and DSP), IP, project management, policy, and an introduction to the work of all the VaxHub research groups.
- Pairs of students were matched up with a VaxHub research group and worked with that group for 10 – 15 days.

That way each student got a minimum of 30 – 36 days.

Why This Model Works

It's scalable	It's meaningful	It's safe and controlled	It builds confidence
The workflow can be adapted to any biologics process (protein, viral vector, microbial system).	Students see the connection between engineering principles and real global health needs.	All steps are bench-scale, low risk, and compatible with academic labs.	Students handle real data, real deviations, and a real sense of ownership.

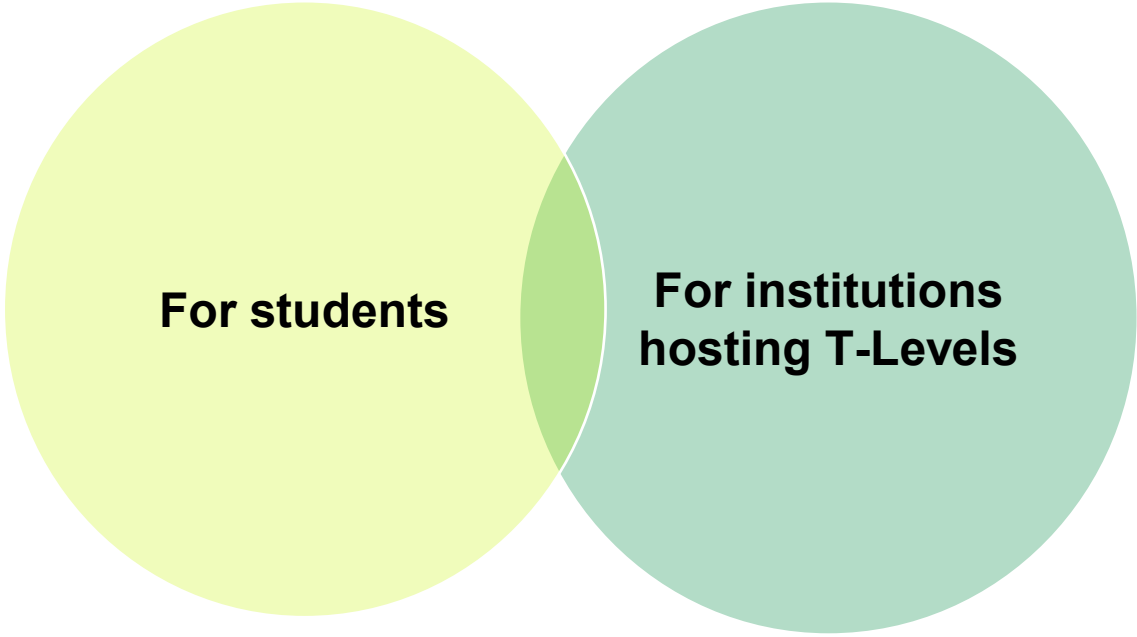
Templates & Tools Provided to Students

- 🛡️ Risk-assessment orientation
- 📓 Lab notebook + SOP pack
- 🔧 Troubleshooting checklist
- 🎯 Daily targets sheet
- 📘 Step-by-step mini-project guide

This way we have a *repeatable and well-structured hosting model.*

Broader Impact

- Demystifies bioprocessing and vaccine engineering
- Boosts confidence to pursue STEM careers
- Provides professional behaviours rarely taught in school



- Enhances visibility of lab-based careers
- Opens pathways for apprenticeships and technician recruitment
- Strengthens ties with educational providers
- Positions institutions as contributors to national skills and health-security agendas

Final Takeaway

"Hosting T-Level students has shown us that young learners can meaningfully contribute to complex bioprocessing work when given structure, trust, and real technology to engage with. Our model demonstrates that impactful placements can be delivered in academic labs, using real vaccine and genetic medicine workflows, and can serve as a blueprint for institutions across the UK."

Resources

Main site:

https://vaxhubnetwork.com/

Outreach and Training:

https://vaxhubnetwork.com/outreach-and-training/

Video series “Careers in Vaccine Development”

https://vaxhubnetwork.com/youtube-series-and-podcast/

Rest of the Team

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