

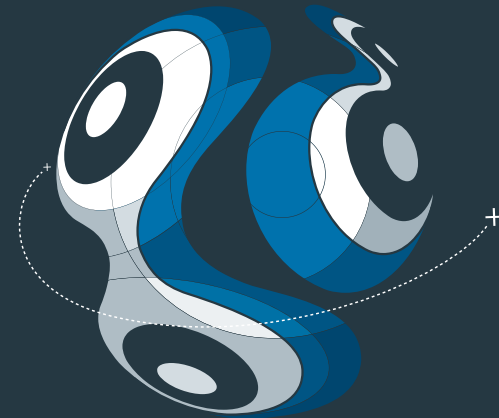


EngD Biopharmaceutical Process Development

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Engineering Doctorate in Biopharmaceutical Process Development

EngagingIndustry



EngD Biopharmaceutical Process Development



EPSRC



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NORTH EAST

ENGAGING INDUSTRY. ENGD BIOPHARMACEUTICAL PROCESS DEVELOPMENT.

INNOVATIVE, COST EFFECTIVE AND RELEVANT TO TODAY'S INDUSTRY



EngD Biopharmaceutical Process Development

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A traditional PhD often involves spending a lot of time looking at a focussed problem, in an isolated, academic setting. One of the challenges for conventional PhD students after they qualify and enter industry for the first time is understanding industrial culture, timescales and priorities. To meet this need, the new Engineering Doctorate (EngD) programme is **designed with a strong industry focus** from the start, providing students with immersion in the industrial environment throughout the 4-year programme.

They work on a portfolio of leading edge projects, typically spending 75% of their time in industry. EngD students are selected from a variety of scientific backgrounds because we recognise the necessity of cross-sectoral learning to innovation within R&D. The interdisciplinary research philosophy of the EngD programme brings together students and researchers from the traditionally distinct backgrounds of biology, chemistry, statistics, computer science and engineering.



They are working at the interface of many scientific disciplines, which is usually where most of the significant advances are made.

The EngD in Biopharmaceutical Process Development at Newcastle University is the first programme of its kind in the UK that enables students to understand Quality by Design (QBD) and to focus on Process Analytical Technologies (PAT).

The EngD is delivered by world-class biological, physical and engineering scientists with expertise in industrial problem solving.

The EngD is supported by brand new facilities in the Biopharmaceutical Bioprocessing Technology Centre

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“WHEN YOU THINK THAT COMPANIES LIKE GSK ARE NOW INCLUDING MORE BIOLOGICS IN THEIR PORTFOLIO, SOMETHING LIKE 20%, THERE ISN'T THE SKILL BASE IN THE UK TO ACTUALLY FULFIL ALL THE NEEDS OF COMPANIES BECAUSE IT'S EXPANDING SO RAPIDLY.”

DR MALCOLM SKINGLE CBE DSC
ACADEMIC LIAISON DIRECTOR, GLAXOSMITHKLINE



The EPSRC is helping UK Industry to bridge this skills gap by supporting the EngD in Biopharmaceutical Process Development at Newcastle University, co-funding 12 Engineering Doctorate students a year for 5 years.

EngDs receive an enhanced funding package that includes an annual stipend of circa £20k. This together with access to world class academics and laboratory facilities means that we attract the highest calibre students.



EngD students are capable of looking laterally at research challenges, injecting fresh ideas and bringing new ways of thinking and working to industrial problems. With the combination of hands-on experience and the support of world class academics, the EngD programme will add real value to your business.

“ THE DIFFERENCE WITH THE ENGD PROGRAMME IS THAT IT BRINGS WHAT LOOKS LIKE TWO DISPARATE TYPES OF SCIENCE - MATHEMATICS AND BIOLOGY - TOGETHER. FROM A COMMERCIAL PERSPECTIVE WE SAW A REAL BENEFIT IN BEING ABLE TO APPLY SOFTWARE AND MATHEMATICAL MODELS TO WHAT WE’RE DOING.

THERE’S NOWHERE ON EARTH THAT YOU CAN GET THE QUALITY OF THE PEOPLE THAT I’VE GOT, THE SUPERVISORS WORKING ON THIS PROGRAMME, THE ENGD FOCUSED ON MY PROBLEMS, FOR THE AMOUNT OF MONEY THAT WE ARE PAYING.”

DAVID VAN ALSTYNE
SCOTTISH BIO ENERGY

AN ENGD DOCTORATE DEGREE WITH A DIFFERENCE

- + Combining technical and professional skills training with applied industrial research
- + Typically students spend 3.5 years with the host company working on industry-led projects
- + Delivering industry-responsive, practical solutions to real-world business problems

Benefits to your company

The EngD programme offers R&D co-sponsorship as part of a long-term investment in skills development:

- + Research that addresses a specific need within your business
- + Excellent Research Engineers with inter-disciplinary skills and knowledge
- + Value for money in terms of direct financial contribution
- + Actively involved in developing the next generation of business leaders

Industry hosts an EngD student for the four year programme to work on a series of research projects with an overarching theme. Each EngD student has an industrial supervisor who oversees the research project(s) on a day-to-day basis.

The crucial benefit is that industry plays a key role in defining the direction and development of project(s) that deliver results within the lifetime of the EngD.



EPSRC

EngD students are supported by funding from the Engineering and Physical Sciences Research Council (EPSRC) which covers their fees and stipend. Companies contribute £8k per year+ as part of an enhanced stipend to ensure we recruit and retain the best student talent to the EngD programme.

+£4k for SMEs

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Our Research

EngD projects sit broadly within three key thematic research areas:

- 0.1 Measurement, data and knowledge management
- 0.2 Systems analysis and building process representations
- 0.3 Enhanced development and operational strategies

Current projects are focussed either on individual areas or the integration of a number of the areas and industrial partners play a central role in defining the research projects.

We work with industry to define research programmes that deliver benefits to the sponsor company, current successes include:

- + Process data interpretation
- + Process control, modelling and optimisation
- + Multivariate analysis in batch and continuous processes
- + Automated image analysis
- + Process scale up and scale down
- + Plant cleaning, verification and optimisation

**“ WE ALL SHARE
BEST PRACTICE
AND WE ALL
LEARN FROM
EACH OTHER,
IT’S FAR MORE
OPEN THAN IT’S
EVER BEEN.”**

DR MALCOLM SKINGLE CBE DSC
ACADEMIC LIAISON DIRECTOR, GLAXOSMITHKLINE



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“ THE ENGD PROGRAMME HAS THE POTENTIAL TO ADD SIGNIFICANT VALUE TO BRITEST’S INNOVATION PLAN BY ADDRESSING CHALLENGES THAT ARE OF DIRECT IMPORTANCE TO US AND WHERE A RIGOROUS ACADEMIC APPROACH IS NECESSARY.

IT PROVIDES THE OPPORTUNITY TO PARTNER WITH EXCELLENT RESEARCHERS WHO ARE ABLE TO DELIVER REAL VALUE TO INDUSTRY WHILST GAINING PRACTICAL EXPERIENCE IN CREATIVE COLLABORATIONS.”

DR MARK TALFORD
SENIOR INNOVATION SPECIALIST, BRITEST LTD

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What Industry says about us

“The EngD programme is providing GEA with a mechanism to explore and develop new concepts with the support of acknowledged academic experts. We expect that the current EngD research project will result in new process control capabilities for our latest generation of pharmaceutical processes.”

Trevor Page

Division Technical Director, GEA Pharma Systems Ltd

“HUK have now taken part in two EngD projects and as a result we have identified the potential to reduce plant cleaning costs by 1/3. From an industry perspective the EngD programme is excellent value for money, supporting the brightest Research Engineers in an industrial context so that they develop the breadth of skills and knowledge to become the next generation of business leaders.”

Richard Heathcote

Sustainable Development Manager, Heineken UK

FREQUENTLY ASKED QUESTIONS



+ How is the student identified?

The recruitment and selection of EngD students follows a two-stage process. The students must first attend an interview with the Programme Director at Newcastle University to assess their academic suitability. Successful candidates are then required to attend an interview with the potential company sponsor, who decides upon their suitability for an industrial placement.

+ When does the industrial placement start?

EngD students typically start the programme in September and spend their first six months at Newcastle University undertaking some of the taught modules and join their host company at the end of January. However in some instances it may be appropriate for the student to take up their placement earlier, depending on industry requirements.

+ What is the balance between the modular and research elements of the EngD?

The programme is split 25% modular programme and 75% research project. Students are required to take 16 modules as part of the EngD programme, 5 of which are completed during their first 6 months initial training in Newcastle. Students typically begin their placements in January and for the next 3.5 years are based at their host company, returning to Newcastle to undertake further modules over the remainder of the programme.

+ How is the modular programme structured?

The taught programme is front loaded so that students take more modules in years 1 and 2 and these are delivered over a week (Monday to Friday). We are mindful that time away from the company can be disruptive to the research and we therefore make every effort not to schedule modules in consecutive weeks.

N.B. The BBTC covers all student costs associated with module attendance.

+ What are the supervisory arrangements/ requirements?

Effective supervision is critical to the success of the individual research projects and the EngD programme overall. Industrial supervisors are required to have monthly meetings with the student to support the management of the research project. In addition, a quarterly meeting should be scheduled with the whole project team; the student, the industrial and academic supervisor and the industrial director.

+ What are the IPR and financial arrangements?

The IPR arrangements are negotiated on a case by case basis with the industrial collaborator, though we take a flexible approach in order to meet the needs of industry. In terms of financial procedures, once the studentship agreement has been executed the finance department at Newcastle University will invoice the company for their financial contribution on 1st October of each year.

+ Will there be interaction with the other EngD projects?

There are formal networking opportunities both with industrialists and other EngD sponsoring companies through the annual EngD conference.

+ How does an EngD compare with a PhD in terms of outputs?

The most defining aspect of EngD programme is the innovative nature of the EngD research, something which underpins the programme and is critical to the delivery of project outputs that have rapid industrial impact.



Current EngD Projects

Our EngD students are currently working on research projects with the following companies

+ ABB	+ Heineken
+ Alcyomics	+ Lonza
+ AstraZeneca	+ Pall Life Sciences
+ Britest	+ Perceptive Engineering
+ CPI	+ Piramal
+ Croda	+ Procter and Gamble
+ Demuris	+ Scottish Bioenergy
+ GEA Pharma Systems	+ Unilever
+ GlaxoSmithKline	

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