



# Driving innovation together

**Newcastle University  
and Procter & Gamble**

Research and innovation for more  
sustainable consumer products





Procter & Gamble, Newcastle Innovation Centre

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Our partnership with Procter & Gamble exemplifies what research and innovation can achieve: translating world-class science into solutions that improve lives and reduce environmental impact. By combining Newcastle's academic strengths with the reach of Procter & Gamble's products in homes across the globe, we're creating a model for how universities and industry can work together to tackle sustainability challenges and drive economic growth.

**Professor Jane Robinson**  
Pro-Vice-Chancellor, Business, Partnerships and Place,  
Newcastle University

# Introduction



**We have established a robust and collaborative partnership drawing from expertise from right across our University. Together we are dedicated to research and education that can develop innovative solutions across multiple P&G business units.**

**Fiona McCusker**  
Strategic Partnerships Manager,  
Newcastle University



**Through Newcastle University we are able to access a world-class, research intensive university that has excellent expertise in areas that are important to P&G. Newcastle University gives us access to state-of-the-art facilities and to the talent that its academics and students bring, to solve our most difficult technical challenges. By collaborating with Newcastle University, we hope to expand science and have a positive societal impact.**

**Ana Morales Garcia**  
Senior Scientist Manager, Procter & Gamble

## When industry and academia work together, innovation happens.

Our long-standing, award-winning partnership is anchored in the North East of England, where Newcastle University sits alongside P&G's Newcastle Innovation Centre in Benton and P&G's global business service business unit at Cobalt Business Park. This shared regional base gives us a unique advantage: close connections, a common purpose and a collaborative culture that enables innovation to thrive.

Built on shared values – scientific and technical excellence, a commitment to sustainability, and a drive to solve real-world challenges – our partnership is a model of open innovation. We believe that breakthrough solutions emerge when knowledge, expertise, and creativity are shared across boundaries.

Together, we're shaping the future of consumer household products, advancing sustainability whilst developing superior performance. From training the next generation of researchers to developing transformative technologies, our work spans disciplines, sectors, and borders.

And the impact is growing. Our success is attracting direct foreign investment to the region, strengthening the North East's position as a global hub for sustainable innovation and translational research.

This is a shared story of innovation with purpose – and we're just getting started.

# Working with students and graduates

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**From professional placements and recruitment events to collaborative postgraduate training in sustainable biotechnology, our partnership helps students build the skills, confidence, and connections they need to thrive during their studies and in their future careers.**

Newcastle University's vision for education is to be a global, future-facing provider of leading edge, inclusive and transformational higher education for our students.

At the heart of the curriculum and learning experiences are encounters with world leading research and the leading edge of industry and practice.

P&G is a key partner for the University in achieving our mission to provide all students with an education for life that engages, challenges and supports them to discover and fulfil their potential, both while they are studying and once they have graduated.





## Professional careers

The North East of England is home to one of P&G's three global business services sites responsible for centralised professional functions, such as finance, IT and human resources.

We work together to connect students to opportunities with P&G including:

- Newcastle University's autumn/fall recruitment fair
- 9-13 month placement opportunities
- careers hub takeover in Newcastle University Business School
- guest employability lectures
- CV and career conversations



## Master's training for sustainable biotechnology

We work together to deliver the MSc in Industrial and Commercial Biotechnology. The programme equips students with the scientific, technical, and commercial skills needed to drive innovation in sustainable biotechnology.

Students gain exposure to real-world industrial challenges with P&G contributing insight into product development, sustainability, and the application of biotechnology in consumer goods.



**Our 13-month placement scheme partnering with Newcastle University has transformed our approach to talent development. Our long-standing partnership is not just about filling positions; it's about cultivating a pipeline of future leaders. Together, we empower both employees and students, creating a mutually beneficial relationship that strengthens our workforce and allows students exposure to a career with real responsibility from day one.**

**Emma English**  
Accounts Receivable & Recruitment Manager,  
Procter & Gamble



## Collaborative doctoral training

We are nurturing the next generation of scientific leaders. By combining Newcastle's research strengths with P&G's business, our partnership is building a dynamic talent pipeline ready to tackle the challenges of sustainable consumer product development and industrial decarbonisation.





## Bioscience for Sustainable Consumer Products (BISCOP)

The BISCOP Collaborative Training Partnership leverages connections that span industry and academia at the forefront of the field. It is an inclusive, collaborative environment for high-quality doctoral training. Started in 2022, the Partnership is equipping 47 PhD students with the knowledge and skills they need to lead the translation of research into sustainable consumer products that have economic and societal impact, both in the UK and globally. The partnership runs across Durham, Northumbria, and Newcastle Universities, together with biocatalyst producer Prozomix.



## Shaping Net Zero Leaders

The Process Industries: Net Zero Centre for Doctoral Training (PINZ CDT) is a strategic partnership between Newcastle University and the University of York. Funded by the Engineering and Physical Sciences Research Council, PINZ is training over 55 PhD researchers to lead the transition to Net Zero in the process industries.

Each research project is co-created with industry to address real-world sustainability challenges. P&G is one of the founding industrial partners of the Centre, supporting research that explores circular, low-carbon solutions for everyday products.



**Our partnership is training up the next generation of bioscientists and helping P&G develop new insights and solutions through collaboration on cutting edge bioscience to serve the needs of P&G's global consumers and accelerate our action on climate change.**

**Dr. Phil Souter FRSC OBE**  
Senior Director R&D, Procter & Gamble

# Research for discovery and impact

**Together we are tackling some of the most pressing challenges in manufacturing and everyday living.**

From reducing carbon emissions in product supply chains to cutting water and energy use in the home, by working together and with others we are turning bold ideas into practical, scalable solutions.





## CarboNation

**Closing the carbon loop in fast moving consumer goods manufacturing.**

Led by P&G, this project is tackling one of the biggest challenges in sustainable manufacturing: reducing the carbon footprint of fast-moving consumer goods (FMCG).

The project focuses on capturing CO<sub>2</sub> from industrial waste gas streams and converting it into valuable raw materials, creating circular, low-carbon pathways for everyday products.



**P&G** is developing carbon capture and utilisation (CCU) solutions to capture low CO<sub>2</sub> emissions from manufacturing plants. With a significantly smaller equipment footprint than conventional CCU, the systems can be retrofitted into existing facilities. The goal is to reduce both direct emissions and the carbon footprint of ingredients while creating circularity by reusing the CO<sub>2</sub> in spray drying processes and formulations.



**Newcastle University** is focused on the modelling, process design, and scale up of the rotary packed bed and other unit operations that enable high capture efficiency of low concentration CO<sub>2</sub>.



**CPI** – a technology innovation centre – is providing expertise in materials processing and conducting economic and lifecycle assessments to evaluate the sustainability and scalability of the approach.



## FairWater

**FairWater is a collaborative project funded by Ofwat's Water Innovation Challenge, aiming to reduce household water use, energy consumption, and utility bills.**

Led by Northumbrian Water, the project brings together partners including Newcastle University, P&G, National Energy Action, and Northern Gas Networks.

The project focuses on four everyday water-using activities – clothes washing, dishwashing, showering, and toilet use – and tests a mix of interventions:

- behavioural nudges
- low-water, low-temperature cleaning products
- new technologies and appliances

Newcastle University is analysing data from 55 sensor-equipped homes and leading behavioural research to understand what drives change. P&G is contributing product innovation expertise to support more sustainable household routines.



# Connecting people, ideas, and progress

## Driving deep collaboration through Innovate UK Knowledge Transfer Partnerships (KTPs).

For over 50 years, KTPs have connected academic expertise with real-world business challenges, driving measurable impact and growth.

At the core of each project is a dedicated KTP associate, embedded within P&G and supported by Newcastle University academics, creating a dynamic bridge between cutting-edge research and commercial innovation.



Innovate UK

Knowledge Transfer Partnerships





## Unlocking new insights in oral health

We're using MicroArray Polymer Profiling to analyse dental plaque in unprecedented detail. By investigating the molecular components of in vivo and in vitro samples we're working toward a deeper understanding of the biochemistry of plaque and calculus alongside demographic and lifestyle factors. These insights will help us to develop new, market-leading diagnostic and oral health products.



## Accelerating product innovation with generative AI

We're working together to integrate large language models (LLMs), knowledge graphs, and advanced analytics into a scalable knowledge-management platform. The project aims to streamline R&D workflows, capture expert insight, and accelerate innovation. This initiative positions AI not just as a tool, but as a strategic partner in delivering smarter, faster, and more consumer-responsive product development.



## Exploring low-carbon consumer products

Our partnership is exploring new strategies for reducing the carbon footprint of consumer product ingredients. By developing a robust framework to assess emerging chemical manufacturing technologies – including lifecycle and techno-economic analysis – this collaboration supports smarter decision-making and accelerates progress toward Net Zero goals. Through this project and in partnership with Durham University, we're laying the groundwork for more sustainable innovation across the consumer goods industry.

# Decoding the biology of cleaning

**In an industry where data and insight drive innovation, we have co-developed a state-of-the-art technique that takes our understanding of soiled laundry to the next level.**

P&G develops best-in-class products for everyday cleaning and hygiene. At their core these products must effectively break down and remove a wide range of marks, stains, and odours such as dirt, food, sweat, and oils, collectively known as soiling.

Understanding the biology of soiling is essential to creating effective, safe, and sustainable cleaning solutions. But with tens of thousands of potential soil types, analysing them all is a significant challenge.

Together we are tackling this challenge head-on. Harnessing the power and precision of microarray technology we've unlocked new levels of understanding of biological soils at unprecedented speed and accuracy.





## Microarray Polymer Profiling

Microarray Polymer Profiling (MAPP) is a robust, high-throughput technique that allows us to explore the biological properties of soils at scale.

Microarrays are created by the deposition of small volumes of hundreds of various samples (soils) at very high spatial densities onto a stamp-sized glass or nitrocellulose surface area using specialised robots.

The microarrays are then exposed to various molecular probes that each bind to different recognition elements in the soils. The resulting interactions of the molecular probes and soiled microarrays enable us to fingerprint, the molecular components of those soils, for example microbial biofilms or adhered food. In turn, this helps guide the development of novel technology solutions such as new enzymes to incorporate into product formulations<sup>1</sup>.

**This patent-pending platform has already led to the discovery of novel enzymes, new mechanistic insights, and has supported product claims** across multiple categories, and resulted in P&G awarding Newcastle University a Connect + Develop Partner Excellence Award.



**Microarrays have been a game-changing high-throughput technology that provide unprecedented levels of new insight into complex problems across multiple business units.**

**Hamish Yau**  
Senior Scientist Manager, P&G



**This technique is built on research into fundamental biological processes that are abundant in nature. It's great to see that exploratory research can also have an impact in innovation.**

**William Willats**  
Professor of Molecular Agri-Diagnostics,  
Newcastle University



<sup>1</sup> – Bakshani CR, Cuskin F, Lant NJ, Yau HCL, Willats WGT, Burgess J. Analysis of glycans in a Burnt-on/Baked-on (BoBo) model food soil using Microarray Polymer Profiling (MAPP) and immunofluorescence microscopy, Food Chemistry 2023, 410, 135379.

# From seaweed to laundry

**Traditional laundry detergents often require high temperatures to effectively remove stains and odours. This can lead to increased energy use, higher household bills, and greater environmental impact.**

Newcastle University's Dove Marine Laboratory at Cullercoats, North Tyneside



Researchers at Newcastle University discovered a novel enzyme released by bacteria living on seaweed. Originally studied to combat marine biofouling on ship hulls, this enzyme – known as a phosphodiesterase – proved to be a powerful natural cleaner. It breaks down sticky molecules that bind dirt and odours to fabrics, efficiently, and at low temperatures.

Working with P&G and biotech supplier Novonesis, the Newcastle team developed the enzyme into a new laundry ingredient called Purezyme®. This breakthrough is now used in Ariel products:

- enables effective cold-water washing
- reduces carbon emissions and energy bills
- demonstrates how nature-inspired science can deliver real-world sustainability benefits



**Improving cold-water laundry cleaning demands breakthrough technology. With Purezyme® we've delivered just that through an exciting seaweed-based innovation developed in partnership with Novonesis.**

**Dr Neil Lant**  
Lead Scientist, P&G; Visiting Lecturer,  
Newcastle University



# Understanding and reducing microfibre pollution from laundry

**In 2016 new research highlighted the role of laundry as a cause of marine microfibre pollution. But there was confusion about the cause. Was it fabric care products or washing machine cycle selection? Our research collaboration found a surprising answer.**



Some people had jumped to the conclusion that fibre loss was caused by abrasion in the washing machine. Others claimed that certain fabric care product ingredients were playing a role.

Collaboration between P&G and Newcastle University made the crucial discovery that the main driver of microfibre release from laundry was hydrodynamic flow of water through fabrics rather than abrasion.

This was confirmed by showing that delicate wash cycles – which have higher water volumes but much less mechanical agitation – release far more fibres than standard wash cycles. Previous assumptions had been that delicate cycles could be used to reduce microfibre release.

These findings have been used by appliance manufacturers to influence design of low microfibre shedding washing cycles. The findings have also helped to educate consumers in how they can reduce microfibre release:

- wash full – but not overfilled – loads
- use cold and quick cycles
- avoid delicate cycles
- move to lower water volume 'high efficiency' washing machines in regions where top loading washing machines are used

The key research article from the team was published in 2019 and is in the top 5% of all research outputs scored by global research tracker, Altmetric. The findings also featured in 388 publications with a reach of 660 million within four days. The story was picked up by many UK national newspapers and broadcasters. CNN recorded a film of the research and its findings to inform their global audience, still available on their website.

This work is a clear example of how rigorous scientific research, combined with real-world application, can help promote more sustainable laundry practices.



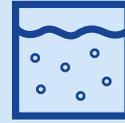
**Microfibre pollution is a complex challenge that spans chemistry, biology, and consumer behaviour. By combining Newcastle's marine research with P&G's product expertise, we're unravelling the key mechanisms involved to help the textile, appliance and fabric care industries investigate solutions with both people and the planet in mind.**

**Dr Neil Lant**

Lead Scientist, Procter & Gamble and  
Visiting Lecturer, Newcastle University

# Our shared future

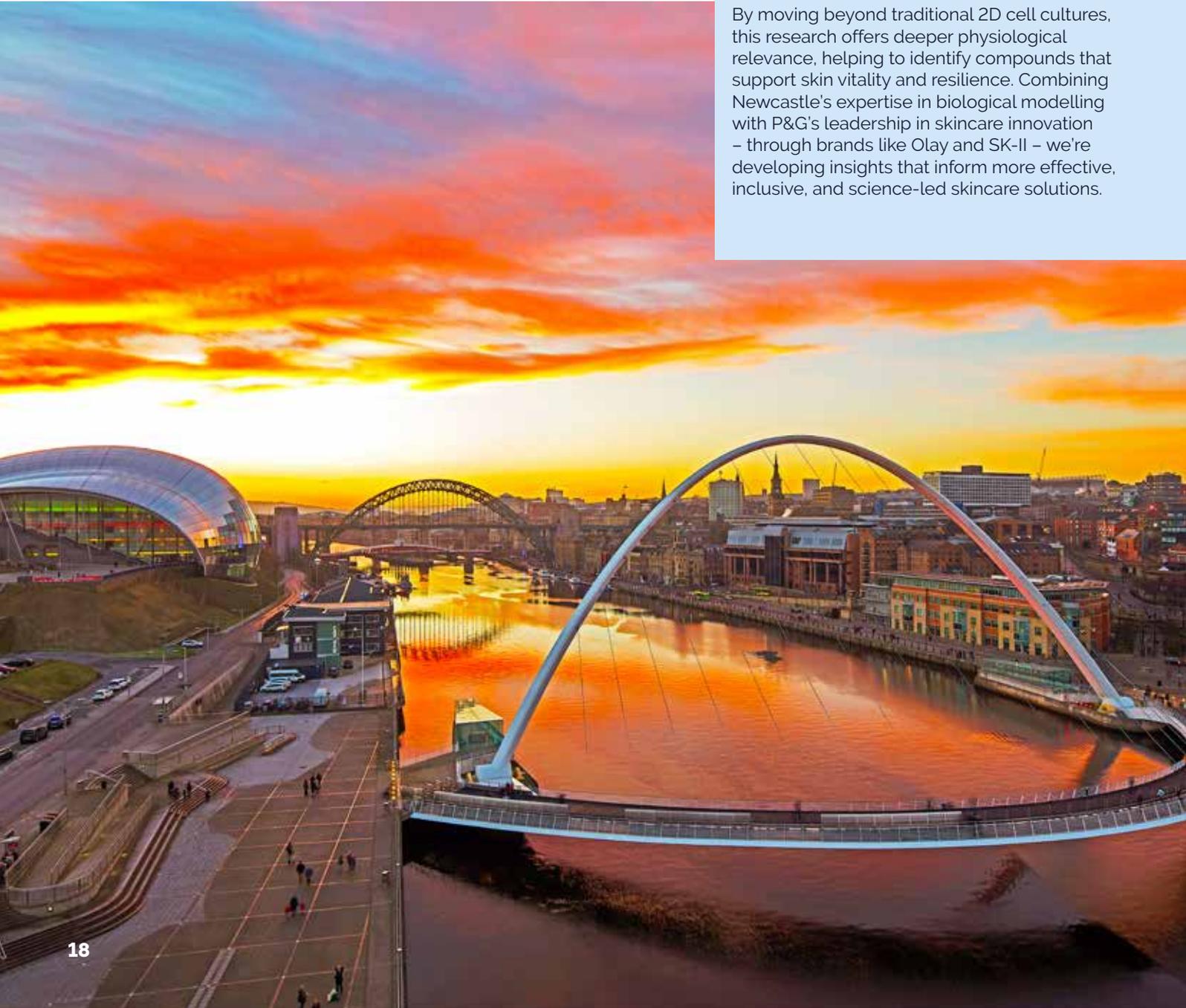
**Our future is grounded in scientific excellence, mutual trust, and a shared drive to solve real-world challenges. Lean innovation that creates constructive disruption is how we're shaping the next generation of superior consumer products.**



## Understanding the biology of ageing skin

Ageing is a natural part of life and with it comes changes in how our skin functions and responds to the world around us. Through advanced 3D skin models, Newcastle University and P&G are working together to better understand these changes and support healthier skin at every stage of life.

By moving beyond traditional 2D cell cultures, this research offers deeper physiological relevance, helping to identify compounds that support skin vitality and resilience. Combining Newcastle's expertise in biological modelling with P&G's leadership in skincare innovation – through brands like Olay and SK-II – we're developing insights that inform more effective, inclusive, and science-led skincare solutions.





## More sustainable production of chemicals, materials, and fuels

P&G has been a founding partner in setting up the Newcastle University Centre for Industrial Biotechnology. The Centre brings together cutting-edge research, advanced facilities, and industry partnerships to tackle some of the world's most pressing challenges, from food security and energy to green manufacturing and health.

Our researchers harness natural processes to develop more sustainable, bio-based practices in areas such as:

- AI and bioscience
- genome sequencing and synthesis
- cell-free systems
- industrial enzymes
- protein design and engineering

Learn more at [ncl.ac.uk/industrial-biotechnology](https://ncl.ac.uk/industrial-biotechnology)



## Strategic fellowship for more sustainable innovation

To deepen our long-standing partnership, we've co-created a unique joint fellowship in industrial biotechnology. This role – now successfully appointed – sits at the intersection of cutting-edge academic research and real-world application, with the Fellow working across both the University and P&G's Newcastle Innovation Centre.

The aim: to accelerate more sustainable innovation by harnessing biotechnology to solve real consumer challenges.

Through this collaboration, we're building long-term capability, fostering cross-sector knowledge exchange, and developing solutions that are not only scientifically robust but commercially impactful.



# From Newcastle. For the world.

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Our shared operations in the North East of England create natural opportunities for knowledge exchange, accelerating research and development through shared expertise and trust. By combining regional strength with a global outlook, we're turning collaborative science into innovations that benefit society and the economy worldwide.





# Lean innovation, constructive disruption

**From pioneering bioscience and AI-driven product development to shaping the next generation of scientific leaders, the partnership between Newcastle University and Procter & Gamble is built on a foundation of trust, shared ambition, and bold, collaborative science.**

Together, we've created a dynamic ecosystem that connects research, education, and industry, delivering real-world impact in superior consumer products. Our work spans disciplines and sectors, from low-carbon manufacturing and marine environmental standards to breakthrough enzymes and advanced skin models.

**But this is just the beginning.**

As global challenges evolve, so too will our partnership. We're committed to lean innovation that contributes to constructive disruption, developing smarter, more sustainable solutions that meet consumer needs and drive positive societal change. And we're already working together to draw more direct foreign investment into R&D here in the North East of England.

Our shared future is one of possibility, powered by science and shaped by collaboration.







# Driving innovation together

## Newcastle University and Procter & Gamble

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sustainable consumer products

### Newcastle University

Newcastle University exists for the public benefit to advance education, learning and research. Our objective is to build on this core purpose and, in doing so, provide new knowledge and creative solutions that make a positive impact. We aim to work collaboratively with our many external partners to shape brighter futures, grow the economy, and champion social justice.

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**Business and partnerships  
with Newcastle University**