UNIVERSITY OF LIVERPOOL

Unilever

Unilever and the University of Liverpool: A world class partnership in action

Driving innovation and delivering economic growth

SQW

Contents

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Executive Summary

- The University of Liverpool and Unilever have a long-standing history of scientific collaboration dating back over 100 years. Over the past two decades, this has developed into a unique strategic partnership, bringing together a global consumer goods company and a leading research-intensive university at the forefront of innovation. The co-location of Unilever and University scientists at the £81 million Materials Innovation Factory in 2018 – alongside open-access innovation space – accelerated the relationship, leading to new scientific discoveries and product launches.

> *"Unilever's relationship with the University of Liverpool is seen as a best-in-class model for how the company interacts with universities worldwide. The collaboration has become an established, high-level strategic partnership."*
>
> Dr Jonathan Hague, Head of Clean Future Science and Technology, Unilever Homecare

- This report considers the development, evolution and contribution of the strategic partnership since 2015, in relation to four areas of research:
  - **Advanced materials**, the largest and longest standing field of collaboration, building on the University's world-leading strengths in materials chemistry and including programmes such as Cleaner Futures; and the Leverhulme Centre for Functional Materials Design.
  - **Microbiome and hygiene**, focused on the interaction of micro-organisms and their impact on health and wellbeing. This includes the Microbiome Innovation Centre, which opened in 2020.
  - **Brain and behaviour,** focused on psychological responses to smell and flavour and the interaction of skin health and wellbeing.
  - **Corporate research and archives,** focused on the use of Unilever's corporate records in understanding social and economic history.

Key findings

- The strategic partnership plays a key role in **driving Unilever's global competitiveness** through product development. 18 of Unilever's current 30 Power Brands have launched innovations with science and technology developed through the partnership. These include the Dove range incorporating the outcomes of microbiome research, and in home care, the

Persil Wonder Wash product launched in 2024, drawing on research at the Materials Innovation Factory.

- Between 2015 and 2024, the partnership resulted in **350 Unilever patents filed** and **85 academic publications** co-authored by University of Liverpool and Unilever staff. It has levered **£136 million in research investment** for the University, and helped create **seven University-led spinouts**.

- The strategic partnership has strengthened the Liverpool City Region innovation ecosystem. This includes **the continued momentum of Liverpool's Knowledge Quarter**, creating a world-class innovation district in the heart of the city. The Materials Innovation Factory is a key part of the Knowledge Quarter's mix of assets, which continue to be developed through major investment, for example the proposed £550 million Health Innovation Liverpool campus. Beyond the city centre, the partnership is a major contributor to the City Region's knowledge economy, including through links between the MIF and Unilever's major R&D facility at Port Sunlight.

- **The strategic partnership has also played an important role in attracting, developing and retaining talent.** Since 2015, it has supported **over 60 postgraduate studentships** and a fellowship programme. Unilever is a key partner in two EPSRC-funded **Centres for Doctoral Training (CDTs),** in Digital and Automated Materials Chemistry and Distributed Algorithms, which together are training over 140 PhD students. These initiatives have helped build a critical mass of talent, enhancing the University's attractiveness and resilience.

- **Beyond science and innovation, the strategic partnership has led to a new understanding of Unilever's place in economic and social history.** Unilever's Archives hold one of the most important collections of business records in the world: collaboration with the University of Liverpool has opened up opportunities for historical research.

- **These achievements represent the continued success of the 'Liverpool Model' of university/industry collaboration**, built on a shared scientific vision and complementary expertise. In this context, Unilever's strategic decision to generate a higher proportion of market innovations through external partnerships has supported a significant return to the regional and UK economies.

Looking to the future

- The next few years will see ambitious plans creating new opportunities for partnership, with a continued focus on the leading edge of artificial intelligence. The University is leading the development of **AIM-HI**, the **Artificial Intelligence Materials Hub for Innovation** – a £100 million, AI-driven materials innovation project that will form part of a new £110 million purpose-built chemical sciences facility in Liverpool's Knowledge Quarter, set to open in 2031. Alongside AIM-HI, the University is advancing plans for the proposed **Microbiome Centre of Excellence** and the **Centre of Excellence in Advanced Biofilm Technologies,** creating opportunities for both public and private investment and collaboration.

A world class partnership in action

Key findings: 2015-24

£136m received by the University for R&D activity

140+ researchers trained across two Centres for Doctoral Training

150 Unilever scientists at the Materials Innovation Factory

350 Unilever patents filed

7 University spin-outs

85 co-authored research publications

Innovations launched in **18** out of **30** Unilever Power Brands

1. Introduction

1.1 The University of Liverpool and Unilever have a long history of scientific collaboration dating back over 100 years. Over the past decade, this has accelerated: the Materials Innovation Factory (MIF) was opened in 2018 as a flagship centre for cutting-edge R&D in the heart of Liverpool's Knowledge Quarter. The collaboration between the University and Unilever has supported world-leading research in relation to new materials development: through the MIF and other facilities, this includes the world's largest concentration of open access labs focused on high throughput formulation, the science of the microbiome, and neuroscience research linked with behaviour and wellbeing. It is a distinctive relationship, built on the complementary scientific capabilities of two institutions both of which are world-leading, and which are rooted in and central to the economy of the Liverpool City Region. Ambitious plans for leading edge science and innovation continues, for example in AIM-HI, the AI Materials Hub for Innovation.

1.2 This report reviews the development and contribution of the University of Liverpool/ Unilever strategic partnership, including and extending beyond the MIF. It sets out the nature and scale of the University's and Unilever's joint research and innovation activity, including the impact that the partnership has had on each institution; its effect on the supply of specialist skills; and wider social benefits. It also considers the role of the partnership in relation to the Liverpool City Region and the national Industrial Strategy.

"Unilever's relationship with the University of Liverpool is seen as a best in class model for how the company interacts with universities worldwide. The collaboration has become an established, high level strategic partnership, combining the University's and Unilever's research expertise to develop new materials and formulations, spin-out companies and cutting edge facilities"

Dr Jonathan Hague, Head of Clean Future Science and Technology, Unilever Homecare

1.3 The study principally considers activity within three main areas of scientific focus, relating to **advanced materials**, the **microbiome,** and **brain and behavioural science**. All three support innovation within three of Unilever's business divisions: Beauty and Wellbeing (which includes hair care and skin care), Home Care (which includes household cleaning and laundry products) and Personal Care (which includes deodorant, skin cleaning and oral care brands). In addition, the strategic partnership extends to **social and historical research** (especially linked with exploration of the

history of Unilever in the Liverpool City Region and globally), and we consider this in parallel.

1.4 In addition to an extensive review of data, reports and other background materials provided by Unilever and the University, the study draws on consultation with some 27 key individuals involved in the strategic partnership, as well as discussion with the joint project steering group.

1.5 The report is structured across five chapters:

- Chapter 2 provides an introduction to the strategic partnership, its evolution, and the key capabilities associated with it.
- Chapter 3 explores the partnership's contribution to innovation and economic growth, in the Liverpool City Region and beyond.
- Chapter 4 considers wider impacts, relating to health and wellbeing, public understanding and engagement with research, and environmental sustainability.
- Chapter 5 brings the study together, setting out the implications for future development and investment.

2. Introducing the strategic partnership

Introducing the partners

Unilever…

2.1 Unilever is one of the world's largest consumer goods companies, with a global turnover of around €50.5 billion in 2025. 3.7 billion people in 190 countries use Unilever products every day[1]. The company is a major investor in research, development and innovation, with an annual worldwide spend of some €836 million on R&D[2]. Headquartered in London, Unilever is a leader in UK industry: in April 2026, Unilever was also the fifth largest company quoted on the London Stock Exchange, with a market capitalisation of £93 billion[3].

2.2 In Beauty and Wellbeing, Personal Care and Home Care, Unilever has world-leading, premium brands. It seeks to develop these through its *Desire at Scale* strategy, supported by a focus on science and technology, including the exploitation of artificial intelligence and a continued ambition to deliver on important sustainability goals[4]. The company has identified 30 'Power Brands', which in 2025 accounted for 78% of turnover[5].

2.3 Unilever has a long history in the Liverpool City Region, dating back to the first production of Sunlight soap and the development of William Lever's factory and purpose-built village at Port Sunlight on the Wirral in the 1880s. Port Sunlight became the location of Lever Brothers' first research laboratory in 1911: it remains Unilever's largest research laboratory worldwide, and its principal R&D centre in the UK[6].

… and the University of Liverpool

2.4 The University of Liverpool is one of the UK's leading research-intensive higher education institutions. Established in 1881 (at around the same time that William Lever was investing in Port Sunlight), it is a founder member of the Russell Group

[1] Unilever, Our Company
[2] Unilever, Annual Report and Accounts 2025
[3] London Stock Exchange (April 2026), FTSE 100 by market capitalisation. The current market capitalisation figure can also be found at the London Stock Exchange website.
[4] Unilever, Annual Report and Accounts 2025
[5] Unilever, Full year 2025 results overview
[6] Alongside R&D centres in Leeds and Colworth, Bedfordshire.

of research universities and is currently ranked among the top 150 universities globally[7] and 18th in the UK[8].

2.5 The University has a world-leading presence in several areas of research. Overall, the 2021 Research Excellence Framework found that some 91% of research assessed was considered "world leading or internationally excellent". Of particular relevance to this study, chemistry at Liverpool was ranked 3rd in the UK for outstanding (4*) research impact and 7th for research overall, while psychology, psychiatry and neuroscience was ranked joint 1st in the UK for world leading research environment and was in the Top 10 for research power overall[9]. Linked with its key capabilities, the University currently defines five 'research frontiers', focused on materials discovery, infection resilience, particle physics, therapeutics innovation, and artificial intelligence for life.

2.6 The University's consistently sector-leading performance in Research England's Knowledge Exchange Framework (KEF) also demonstrates its excellence in partnerships across business, public, and third sector organisations. The University is placed as one of the country's leading universities for knowledge exchange, and its partnership with Unilever highlighted as a key strength[10].

2.7 The University is a substantial economic anchor in the Liverpool City Region. In 2022/23, the University directly employed over 7,800 staff, and its total economic impact in the City Region was estimated at around £1.2 billion[11], with over 28,000 students studying on campus.

2.8 Looking to the future, the University's strategy, *Liverpool 2031*, sets out an ambition to develop both research capacity and local impact. Among its aims, it seeks to break into the top 100 ranked universities worldwide and "drive prosperity and wellbeing for Liverpool City Region". Specifically, the strategy seeks to leverage the value of its leading research assets, including the Materials Innovation Factory, and identifies a priority to create a "Materials Innovation Supercluster", building on its partnership with Unilever[12].

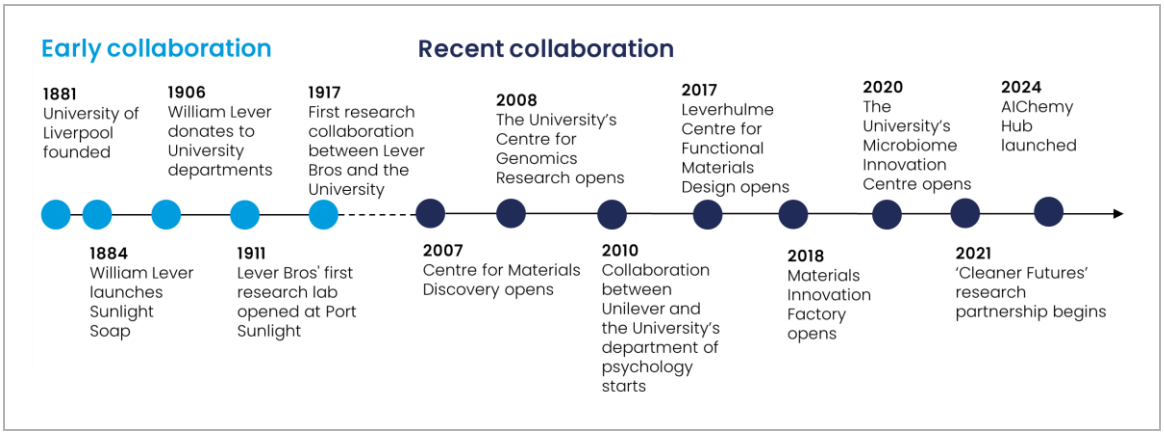
[7] Times Higher Education World University rankings 2026
[8] The Times University rankings 2026
[9] Times Higher Education REF rankings
[10] University of Liverpool, Knowledge Exchange Framework
[11] Amion/ University of Liverpool (2024), *University of Liverpool: Economic and Wider Impacts*
[12] University of Liverpool, *Liverpool 2031: Our Strategic Ambition*

The evolution of a strategic partnership

Over a century of collaboration…

2.9 The partnership between Unilever and the University of Liverpool has a long history, dating back to 1906 and William Lever's donations to a number of University departments. From 1917, collaboration took place in scientific research, initially focused on the (then) Department of Industrial Chemistry.

Figure 1: The long-term collaboration timeline



Source: SQW

Accelerated through a shared strategic vision…

2.10 Although collaborative research had been undertaken for many years, the partnership accelerated from the turn of the millennium, linked with Unilever's ambition to generate a higher proportion of its market innovations through external partnerships. This enabled it to combine public and private research investment and leverage the University's scientific strengths[13].

2.11 From the early 2000s, Professor Steve Rannard (then at Unilever) and Professor Andrew Cooper FRS collaborated on high-throughput chemistry technology to accelerate the development of new materials with application in a range of home care and personal care products. This supported the co-location of Unilever staff at the University, and formed the start of the **'Liverpool Model'**, an approach to academic/industrial collaboration built on a shared scientific vision, and including specialised space, unique or highly differentiated equipment and software, skilled technical support and an embedded network of equipment and

[13] Campbell, N.J. (2017), A case study of a university-industry partnership in science and technology: What drives extraordinary performance? University of Liverpool: unpub. DBA thesis, p.132

support providers, as well as academic thought leaders who bring world-leading added value to the partnership[14].

2.12 The emerging 'Liverpool Model' was substantially brought to life at the **Centre for Materials Discovery** (CMD), which opened in 2007 as a shared resource to speed up the research process. The automated materials discovery programmes delivered by the CMD delivered significant beneficial impacts for both the University and Unilever, with a reported increase in Unilever product sales of over €500 million per annum[15]. The success of the CMD model provided a platform for expanding the collaboration and scaling-up associated R&D activity.

2.13 While materials discovery was the primary driver of the strategic partnership, other investments supported further collaboration in additional scientific fields. For example, the University's **Centre for Genomics Research** was established in 2008, subsequently building collaboration with Unilever in microbiome research.

… and scaled up through new investment

2.14 Since 2015, the scope and scale of the strategic partnership have extended substantially. At the heart of this is the Materials Innovation Factory, the physical 'flagship' of the University/Unilever partnership:

The Materials Innovation Factory

- Building on the success of the Centre for Materials Discovery, the **Materials Innovation Factory** was opened in Liverpool's Knowledge Quarter in 2018, subsequently incorporating the CMD and the **Leverhulme Research Centre for Functional Material Design,** which opened in 2017 following a £10 million award from the Leverhulme Trust.

- The £81 million investment in the MIF was led by the University of Liverpool, with contributions from Unilever and support from UKRI's UK Research Partnership Investment Fund, covering both capital and operational expenditure. This included a significant contribution from the Henry Royce Institute (the UK's National Institute for Advanced Materials Research and Innovation, of which the University of Liverpool is a founder member), which invested approximately £10 million in open-access equipment at the MIF.

[14] Reed, M. and Langford, J. (2021), *The University Partnership Playbook: How to build strategic research relationships*, University of Liverpool Press

[15] University of Liverpool, Unilever Partnership

- The Centre offers 11,600 sq m of flexible space, including dedicated facilities for Unilever's home care and personal care teams plus flexible open access robotics labs and 'research hotel' facilities on the ground floor. As well as the Leverhulme Research Centre for Functional Materials Design, the MIF hosts an **Advanced Training Centre** that trains PhD graduates to work at the interface of physical science, artificial intelligence, data science and robotics.

- The MIF's use of robots in material chemistry is world leading, with machines improving consistency across samples and testing, and speeding up the research process. The combination of specialist equipment and technical support at the MIF, and the shared vision between the University and industry which is at the heart of the Liverpool Model means that research at the MIF has directly supported the launch of new Unilever products, including **Dove's Intensive Repair** line, **TRESemmé's Colour Radiance Booster** range of hair products, and the **Hourglass Confession Red Zero** vegan lipstick product, in addition to others discussed later in this report.

- The MIF continues to offer space for new partnerships and ventures. In 2024, £12 million from the EPSRC and a further £19 million from consortium partners supported the establishment of the **AIChemy Hub**, led by the University of Liverpool and Imperial College and focused on cross-disciplinary research to develop the role of artificial intelligence-enabled technologies (such as machine learning, automation and robotics) to support faster chemistry discoveries.

- Currently, Unilever has around 150 scientists working at the MIF over the course of the year (with 75-80 using the facility at any given time), a figure that has doubled since the facility was established. As well as supporting globally significant product innovations, the MIF model also generates valuable data and insights for Unilever that supports pioneering process innovation too – thus helping to de-risk and enhance R&D activity.

- Unilever consultees described the bespoke equipment and robotics labs within the MIF as 'leading edge'. But there is a need for constant reinvestment and innovation to stay ahead of the pack – a challenge and opportunity that we return to later.

2.15 The strategic partnership has evolved to being Unilever's largest partnership with a single university. In consultation for this study, stakeholders commented on the importance of trust and individual relationships being built over time, as well as

the value of physical proximity between Unilever's Port Sunlight facility and the University and the quality of the scientific research undertaken. **However, the development of a shared vision has been central in driving long-term engagement,** with the strategic partnership based on intellectual alignment and commitment, not *just* the provision of (world leading) services and facilities.

Collaboration in relation to the four areas of research focus: A brief introduction

Advanced materials

2.16 Advanced materials is the largest field of scientific activity within the strategic partnership, as the development of the Centre for Materials Discovery and its evolution into the MIF illustrate. Long-standing relationships between leading scientists at Unilever and the University (for example, the teams led by Professor Matthew Rosseinsky OBE FRS and Professor Andrew Cooper FRS in inorganic and organic materials respectively) have been important in building trust and a track record from which to scale up.

2.17 Improved sustainability has been a key focus of materials collaboration, reflecting the strong sustainability emphasis in Unilever's strategy. Since 2021, this has included **Cleaner Futures**, an £8.8 million collaboration between the two institutions and the University of Oxford, funded by EPSRC. This aims to reduce the carbon footprint of consumer products such as shampoo and detergents through improved chemical production. Research through the strategic partnership also led to the launch in 2024 of Unilever's **Wonder Wash** short cycle laundry product, and materials research has also been key to the development of improved cosmetic and hair products – we say more about this later in the report.

2.18 Unilever also collaborates with the University through the **Open Innovation Hub for Antimicrobial Surfaces led by Professor Rasmita Raval**, which seeks to develop new processes and technologies to combat antimicrobial resistance. The University co-directs the **National Biofilms Innovation Centre**, established in 2017, with Unilever chairing NBIC's Non-Executive Board[16]. NBIC-Liverpool pioneers innovation in next-generation antimicrobial, anti-biofilm and antiviral surfaces and coatings.

[16] National Biofilms Innovation Centre (2025), Annual Report 2025. The other lead universities are Edinburgh, Nottingham and Southampton.

2.19 Digital innovation is at the heart of the strategic partnership's advanced materials activity. The **Leverhulme Research Centre for Functional Materials Design**, housed at the MIF, has a series of research themes, including intelligent automation through continued investment in robotics, the development of AI-assisted research and computational materials design. The **AIChemy Hub**, led by the University of Liverpool and Imperial College focuses on cross-disciplinary research to develop the role of artificial intelligence-enabled technologies to support faster chemistry discoveries. The **Digital Innovation Facility**, a purpose-built innovation lab within Liverpool's Knowledge Quarter, also contributes to research supported by the partnership with Unilever. Looking to the future, **AIM-HI**, the planned AI Materials Hub for Innovation, will be a major investment in further developing the MIF (and the University of Liverpool's capabilities in materials chemistry).

Microbiome and hygiene

2.20 Recent years have seen an increasing focus on the interaction of micro-organisms and their impact on human and animal health. Advances in high-throughput sequencing, multi-omics[17] and artificial intelligence have increased understanding of their importance to health, challenging the traditional view of microbes as pathogens and a consequent focus on the use of anti-microbials in beauty and wellbeing products.

2.21 Unilever's collaboration with the University on microbiome research pre-dates the period of this study. However, in consultation, Unilever and University stakeholders observed that microbiome research was still a "niche" area in 2015: since then, it has become increasingly salient, with much of Unilever's research interest focused on the link between imbalances in the microbiome and skin health and the implications for the evolution of skin and hair products. As the MIF was being developed, a MIF OMICS facility opened in 2016, with joint research contributing to the launch of the **Dove Gentle bodywash** product in 2018, the first of Unilever's beauty and wellbeing products to use the outputs of microbiome research.

2.22 The University's **Microbiome Innovation Centre** was launched in 2020. Since then, collaboration has included a Knowledge Transfer Partnership focused on the relationship between the microbiome and psychological wellbeing, described further in a case study in Chapter 4 The Microbiome Innovation Centre also delivers the Liverpool City Region Life Sciences Innovation Zone Project, the **Microbiome and Infectious Disease Innovation Hub (MaID)**, in partnership with the Centre for Process Innovation. The MaID Hub provides support to innovative

[17] The large-scale study of biological molecules

businesses, including access to labs, experimental design, consultancy and regulatory and commercial guidance. In addition, the University leads the national Microbiome Innovation Network (Microbiome-Net).

Brain and behaviour

2.23 Collaboration between Unilever and neuroscience researchers at the University of Liverpool's Psychology department has existed since 2010. The focus of the collaboration is on neurosignalling, the process by which neurons (nerve cells in the brain) communicate with each other through electrical and chemical signals. Tracking neurosignals enables researchers to understand how people respond to sensory triggers, such as smell or touch.

2.24 Initially, the joint research related to understanding brain responses to vanilla, and the implications of this for flavourings and aromas. This led to collaboration with the University's capabilities in neuroimaging. Subsequently, the partnership has extended to other fields, including brain responses to fragrances and the evolution of neurocosmetics, linking research in neuroscience with research into the microbiome to understand how products can benefit the skin and interact with emotions.

2.25 The collaboration has led to the establishment of the Brain and Behaviour Lab within the University's Institute of Population Health and has supported 16 publicly funded projects since its inception, generating over £2 million in research income.

Convergence and links

Although the three areas of research focus are described separately, there are close links between them – for example in how new understanding of the microbiome informs research into psychological responses to stimuli and approaches to antimicrobial resistance. The use of artificial intelligence and robotics in opening up new research fields is also central to all three and has made transformational advances in recent years.

There are also links to other scientific fields: for example, to the University's other 'research frontiers' in AI for life, infection resilience and therapeutics innovation

Corporate history and archives research

2.26 The fourth area of research focus is somewhat different from the first three, in that it is not focused on activities which will lead to new product development,

but on improved understanding of the evolution of Unilever's role as a major economic institution and its place in wider economic and social history, including in relation to contemporary debates around the legacy of colonialism.

2.27 Between 2021 and 2024, the University's History department collaborated with Unilever to independently research the Lever Brothers' presence in the Congo and elsewhere[18], bringing the University's expertise together with Unilever's extensive corporate archives (discussed further in a case study in Chapter 4). Beyond this, there has also been collaborative research into the United Africa Company Archive and its cataloguing, an ESRC funded PhD on 'Changing Attitudes to Smell in the 20th Century', and a Leverhulme Trust funded study of 'Mercantile Architecture in West Africa'. A cross disciplinary group of academics meet with Unilever Archives on a routine basis to discuss collections synergies, potential research, funding and outreach.

The broader policy context

Contributing to the UK's Industrial Strategy and growth potential…

2.28 The Unilever/University of Liverpool strategic partnership represents a long-term partnership between a leading company and a leading academic institution, which, over the past decade, has secured substantial private investment, alongside public funds, to support public benefits (pioneering innovation leading to wider economic outcomes) as well as commercial return. The development of this collaboration is especially important in the context of current economic and industrial policy, and the Government's focus on raising productivity and the UK's long-term growth potential.

2.29 In 2025, the Government launched the new **Industrial Strategy,** setting a framework for the remainder of the current Parliament, and potentially beyond[19]. Three aspects of the Industrial Strategy are especially relevant to the strategic partnership:

- First, a policy focus on a limited number of **'frontier industries'**: sectors where there is potential for sustainable growth and in which the UK has distinctive strengths. Advanced manufacturing features prominently, especially in relation to advanced materials. The Strategy notes the ambition to double

[18] Cho, H., Cross, H. and Tierney, J. (2025), *Report on Lever Brothers' Plantations in the Soloman Islands and Belgian Congo, c.1900-1930s*, Unilever/ University of Liverpool/ Royal African Society
[19] UK Government (2025), *The UK's Modern Industrial Strategy*

annual business investment by 2035, with a commitment of up to £2.8 billion R&D funding over the next five years, and an acceleration in the adoption of robotic technologies.

- Second, a focus on **industrial clusters in city regions**. The Strategy recognises the need to strengthen city region competitiveness and to focus resources on those local strengths that can deliver long-term growth in the identified frontier industries. It includes a commitment to "grow high-potential innovation ecosystems". Unilever is specifically highlighted as being central to Liverpool City Region's innovation system. Elsewhere, **"universities will play a critical role in delivering the Industrial Strategy"**, including through their role as 'anchor institutions' within city regions.

- Third, a commitment to create a **strengthened partnership with industry.** This includes a recognition that "Government co-investment has a critical role to play in crowding in private investment and building long-term partnerships with investors", and a commitment to ensuring that private sector contributions to economic resilience and growth are fully taken into account when considering the case for public investment. This is important in the context of the 'triple helix' (university, industrial and Government) investment model that forms the basis of the current University of Liverpool/Unilever strategic partnership.

2.30 The potential of **artificial intelligence** to accelerate growth in all the 'frontier industries' is recognised in the Industrial Strategy and the **AI Opportunities Action Plan** published at the start of 2025[20]. For example, the Sector Plan for advanced manufacturing (developed as a supplementary document to the Industrial Strategy) contains an ambition for the UK to become *"a global leader in scaling up innovation and automation"*[21]. More specifically, in 2025, the Henry Royce Institute published the **National Materials Innovation Strategy.** This highlights the role of a "digitally enabled materials sector" in drastically reducing the lead time to commercialisation and the UK's leading role[22].

… and driving forward growth and innovation in Liverpool City Region

2.31 Linked with the Industrial Strategy at national level, the ten-year **Liverpool City Region Growth Plan** was launched by Steve Rotheram, the LCR Metro Mayor, at

[20] UK Government (2025), AI Opportunities Action Plan
[21] UK Government (2025), Advanced Manufacturing Sector Plan
[22] Henry Royce Institute (2025), Material Futures: Unlocking UK economic growth through materials innovation

the Materials Innovation Factory in October 2025[23]. Within the context of a mission to raise productivity (and the improved incomes and living standards that flow from this), the Growth Plan highlights the City-Region's international leadership in materials chemistry, its strengths in health and life sciences (with links to innovation in the microbiome and neuroscience cited earlier) and advanced manufacturing, and the wider concentration of innovation assets around Liverpool Knowledge Quarter.

2.32 Combined, these national and regional plans provide a strong platform for the future growth and development of the strategic partnership – and a vantage point from which to look back over the impact of recent innovation excellence.

[23] Liverpool City Region Combined Authority (2025), LCR Growth Plan

3. The partnership's contribution to innovation and economic growth

3.1 The strategic partnership makes a major contribution to Unilever, the University and the wider City Region. This chapter sets out the partnership's impact on competitiveness, innovation and economic growth, drawing on case studies and practical examples.

Product development and innovation

The strategic partnership has driven several global product launches

3.2 **New product development helps to drive Unilever's global competitiveness.** 18 of Unilever's current 30 Power Brands have launched innovations with science and technology developed through the partnership. These include the Dove range incorporating the outcomes of microbiome research, and in home care, the Persil Wonder Wash product launched in 2024, drawing on research at the Materials Innovation Factory to increase the efficacy of detergents in short cycles, reducing water and energy use.

Some of Unilever's new product launches

- The launch of the **Dove Gentle** range in 2018 represented the first use of skin microbiome research in a commercial beauty and wellbeing product, building on joint research between the University of Liverpool and Unilever
- Through research at the MIF and Port Sunlight, new leading edge measurement capabilities were used to visualise structures within hair fibres, helping to understand the penetration and distribution of Dove's active Damage Therapy ingredient. This led to the launch of the **Dove Intensive Repair** range.
- In 2021, Unilever launched the **Hourglass Red Zero Confession** lipstick, a vegan product that was able to achieve vivid colour quality without the use of carmine or other animal products. Research at the MIF enabled multiple colour sets to be analysed in a fraction of the time that would have been required without the MIF's leading-edge automation.

- In 2024, Unilever used the automation facilities at the MIF to generate and test 400 formulations for shampoo products, to generate savings while maintaining product superiority. Successful formulations were then transferred to Port Sunlight for scale up development, with these then subsequently used in **Sunsilk** and other shampoo products.

- Also in 2024, Unilever launched a new product under its **TRESemmé** hair care brand that uses lamellar structure technology developed via the Materials Innovation Factory to bond hair fibres and improve shine. TRESemmé Lamellar Shine responds to rising demand for shine-boosting hair care products, helping to maintain the brand as one of the world's leading styling products.

- In Home Care, research and testing via the MIF Unilever launched **Persil Wonder Wash** in 2024, the company's first liquid detergent designed to work in short cycles, responding to consumer demand for convenience, as well as improving environmental sustainability.

"Using robots allows us to maintain consistency across sampling and testing. We're also freeing up time for our scientists to be creative, to experiment and invent… This all helps us to bring new innovations to market at a pace previously unimaginable".

Paul Jenkins, Global Research Director for Physical and Chemical Sciences, Beauty and Wellbeing, Unilever

Source: Unilever

Patents have risen over time

3.3 **The strategic partnership is a significant source of patent filings and awards.** 350 patents were filed by Unilever between 2015 and 2024, and the University reported over 200 patents pending or granted (in all jurisdictions) over the same period. **There has been a clear rise in successful patent applications over time**: in 2015, the University applied for 19 patents (excluding those that were subsequently withdrawn or abandoned), rising to 59 by 2022.

There is a growing volume of research outputs and publications

3.4 **Between 2015 and 2024, 85 academic publications were co-authored by Unilever and University of Liverpool staff.** The volume of papers published has increased over time, from seven in 2015, to 15 and 16 in 2023 and 2024 respectively. In addition, those academics identified as collaborating with Unilever published a

further 992 papers that were not co-authored with Unilever but were nevertheless in subjects related to the collaborative research programme.

Figure 2: Global collaborations in research outputs

Source: Automatic Knowledge, based on University of Liverpool and Unilever data

The partnership has levered significant research investment

3.5 The strategic partnership is an important driver of income to the University:

- Between 2015 and 2024, **the University secured £136 million in research income linked to the Unilever partnership**[24]. This includes funding from industry (including Unilever), Research Councils and other government and international bodies, and relates to open project calls, grant funding, knowledge transfer partnerships and studentships. Of the research funding secured, around 93% related to advanced materials.

- Approximately £29.9 million was secured by the University through consultancy and facilities income, mainly relating to the MIF.

[24] This takes into account: all research income to the University that was funded by Unilever; all research income to the University for projects in which Unilever was a named partner; and research income that related to the four areas of research focus in this study, where key academics engaged in collaborative work with Unilever were involved. In the case of the latter, where involvement was a small part of the total, an estimate of attribution was included, linked with the relevant academic(s)' level of involvement in the project. Figures relate to academic years, from 2015/16 to 2024/25.

- The University has also secured some non-research income associated with the strategic partnership, some of which was from Unilever. Between 2015 and 2024, this amounted to around £2.8 million.

Enabling spin-outs and other industrial collaborations

3.6 The strategic partnership helped to create **seven university staff-led spin outs** created over the study period. These include **Gearu**, which grew from research by Professor Andy Cooper and Dr Benjamin Burger into the development of an intelligent mobile robot scientist, and which has subsequently provided custom-made robotic solutions.

3.7 In addition, there are some smaller businesses accessing the infrastructure associated with the strategic partnership. For example, **Penrhos Bio** was formed in 2019 as a partnership between Unilever and Innova Partnerships to develop bacterial and microbial innovations. It has worked closely with Unilever via the MIF and benefited from the University's biofilm expertise.

3.8 There are also several larger businesses accessing the MIF. **Croda**, a life sciences and consumer care company, has an established relationship with Unilever, producing ingredients for the beauty, home care and fragrance markets. From 2017 to 2025, Croda maintained its Centre of Innovation for Formulation Science at the Materials Innovation Factory, and the company has a specialist laboratory at Daresbury and a manufacturing site near Widnes. Other beneficiaries of the specialist capabilities at the MIF include **NSG Pilkington, Uberbinder** and **Boots,** amongst many others. This reflects the strategic decision by Unilever and the University to establish and manage the Open Access Area within the MIF as a genuinely open innovation facility.

3.9 The National Biofilms Innovation Centre also has a strong record of industrial collaboration. Partnering with global companies – including NSG Pilkington and Croda, as well as Unilever - and with SMEs, NBIC has invested in 90 technologies, fostered 13 spin-outs, delivered 43 IP filings and supported 75 PhD students[25].

[25] University of Liverpool, Advancing biofilm technologies

Strengthening the Liverpool City Region innovation ecosystem

The impact of the University's participation

3.10 In 2024, **around 400 jobs were attributable to the University's participation in the partnership**. This included around 140 direct FTE jobs within the University itself, and around 260 created in the supply chain and as a consequence of further staff expenditure.

3.11 Over the decade to 2024, these jobs contributed to the generation of some £270 million in gross value added (at 2024 prices), including £146 million in Liverpool City Region. These impacts have grown over time.

Supporting Unilever's investment

3.12 **The strategic partnership has played an important role in strengthening Unilever's presence in the Liverpool City Region**. Unilever maintains its largest UK R&D facility at Port Sunlight, which is one of the largest concentrations of private sector employment in the Liverpool City Region. This is reinforced by the strategic partnership:

- **Proximity between Port Sunlight and the Materials Innovation Factory (and other University assets and staff) was cited by consultees as a key factor in the success of the partnership.** Stakeholders observed that collaboration with more distant institutions is more challenging and 'transactional' (and noted that it has not been possible to build a similar relationship elsewhere), and that proximity, practical ease of use of specialised shared facilities, and the regular interaction that builds up trust and relationships and reinforces a shared vision are all connected.

- **There has been significant investment at Port Sunlight over the study period in areas that are clearly complementary to the strategic partnership.** In 2017, Unilever opened a **Advanced Manufacturing Centre** at Port Sunlight, focused on the transformation of formulations into 'factory-ready' innovations. Subsequently, the Port Sunlight **Product Innovation Lab** opened in 2023, and further investment in a new fragrance facility was announced in 2025:

The Port Sunlight fragrance facility

- In May 2025, Unilever announced an investment of £80 million in a new fragrance facility and accompanying technology and skills development at Port Sunlight. The focus is on the development of fragrance to improve the customer experience of home care, personal care and beauty and wellbeing products.
- The new, digitally enabled facility will incorporate an innovation lab and compounding facility, with the aim of speeding the process from formulation to design, manufacture and launch.
- Although the investment is separate from the strategic partnership, there are clear links to it, especially the programme of research focused on neuroscience and emotional responses to flavours and fragrances.

Source: Unilever

3.13 Unilever has also invested in R&D elsewhere in the Liverpool City Region, including the establishment of a new global product development hub for Elida Beauty personal care at Liverpool Science Park (note that this business was sold to Yellow Wood Partners in 2024).

Enhancing the wider innovation network

3.14 The strategic partnership is also part of a wider 'ecosystem', the network of institutions, investors and talent that enables innovation to take place and be diffused. We have already explained some of the ways in which the partnership contributes to this wider ecosystem, for example by building up a 'critical mass' of scientific talent, attracting other innovative companies to the MIF and to work collaboratively, and by enabling spinout companies. More broadly, Unilever and the University are core components of the Liverpool City Region 'triple helix' innovation ecosystem.

3.15 In addition, **the key assets associated with the partnership make a major contribution to Liverpool's Knowledge Quarter.** The Knowledge Quarter extends for about 450 acres across Liverpool city centre and brings together the University with other academic and investment partners to create and promote a "world-leading innovation district". The Materials Innovation Factory forms a key part of the Knowledge Quarter's asset mix, alongside other new innovation and R&D centres such as the Digital Innovation Facility, the Accelerator on Liverpool Health Campus, and the Central Tech focal point for sensor technology

innovation and digitalisation. In combination with the Knowledge Quarter's academic institutions (including Liverpool School of Tropical Medicine and Liverpool John Moores University, as well as the University of Liverpool) and its major NHS research infrastructure, these help to build critical mass of high-value activity. This is currently being augmented with extensive complementary development, for example at Paddington Village at the eastern gateway to the Knowledge Quarter, where the flagship Spine building (160,000 sq ft of Grade A offices) has recently been delivered.

3.16 Building on the Knowledge Quarter's strengths, **Health Innovation Liverpool** (HIL) is an ambitious £550 million development to create a cluster of clinicians, scientists and facilities that will attract major new investment and co-location from industry. It is estimated that it will bring over 2,200 jobs and deliver over £1 billion in economic benefits to the wider City Region[26]. Health Innovation Liverpool builds on existing strengths in infectious disease, diagnostics, clinical trials, and public health. Creating a platform for skills development, inward investment and health system innovation, it aligns closely with national priorities around prevention, resilience, and reducing health inequalities, accelerating the translation of cutting-edge research into population-level impact.

3.17 Plans are also being progressed to bring forward more than 200,000 sq ft of commercial lab space through the HEMISPHERE One and Two developments on adjacent plots to the Spine.

3.18 **The Unilever/ University of Liverpool strategic partnership has catalysed much of the momentum, economic activity and global profile of the Knowledge Quarter.** The pace of development over the past decade – with much more in the pipeline – indicates that the strategic decision by Unilever to make a substantial investment in R&D facilities and activity alongside the University in central Liverpool has created a significant driver for science and innovation activity, with positive spillover effects for the rest of the Knowledge Quarter and central Liverpool.

3.19 **The strategic partnership also supports the extension of the innovation ecosystem *beyond* the Knowledge Quarter**, including at Port Sunlight. This contributes to stronger networks across the Liverpool City Region, supporting the resilience of the wider economy and complementing efforts (highlighted in the *LCR Growth Plan)* to drive agglomeration and innovation-led productivity growth.

3.20 The strategic partnership has also helped to strengthen institutional capacity and leadership across the Liverpool City Region innovation system. Examples

[26] Liverpool City Region Combined Authority (2025), *LCR Growth Plan*

include the influential roles of Sir Howard Newby (former Vice-Chancellor of the University of Liverpool) and later Dr Jonathan Hague (Head of Clean Future Science and Technology for Unilever's Homecare Business Group and former Vice President Open Innovation) in chairing the Liverpool City Region Innovation Board and Professor Dame Janet Beer (former Vice-Chancellor of the University of Liverpool) in previously chairing the Liverpool Knowledge Quarter Board.

Developing advanced skills and talent

3.21 Between 2015 and 2024, the strategic partnership supported over 60 relevant postgraduate studentship projects. This secured around £2.4 million in income to the University, about half of which was sourced from Unilever. From 2013, Unilever also invested in fellowships, to support postdoctoral positions. The fellowship programme enabled a mix of academic research, industrial projects and consultancy work, which could address Unilever's business needs while contributing to a sustained body of research. Stakeholders at both the University and Unilever highlighted the value of the fellowship programme in strengthening the partnership over time.

3.22 Towards the end of the study period, new investment has also come forward to build on Liverpool's success in materials chemistry and support future researchers:

Centres for Doctoral Training

- Centres for Doctoral Training (CDTs) aim to support next-generation research talent.
- Established in 2019, the EPSRC CDT in **Distributed Algorithms** has so far trained 55 PhD students across five cohorts, addressing challenges in defence and manufacturing and meeting the need for highly skilled data scientists. The CDT forms part of the University's Signal Processing Group, a data science, AI and machine learning research centre. Project partners, including Unilever, have invested over £3.7 million to work with the CDT's research experts[27].
- At the University of Liverpool, a CDT has been established in **Digital and Automated Materials Chemistry**, training over 80 PhD students with expertise in robotic, digital, chemical and physical thinking, applied to materials design, discovery and processing. 18 PhD projects were offered to start in 2025/26, working alongside industry, most of which involve training within the Materials Innovation Factory. Unilever is one of the key industrial partners involved in the design of the programme and is financially supporting the largest number of studentships[28].

Source: University of Liverpool

3.23 In addition to the CDTs, the **Leverhulme Centre for Functional Materials Design** offers a range of PhD opportunities and external fellowships to support research capacity and capability in understanding atomic-scale materials design.

3.24 Stakeholders highlighted the importance of the strategic partnership in **increasing capacity and retaining a 'critical mass' of talent.** While consistency of personnel has been a key factor in building relationships (and some of the key individuals that have driven the partnership forward are highlighted in this report), the additional capacity provided by the MIF, the Unilever research fellowships, and additional doctoral training has built resilience and diversity over time. Consequently, this has made the University of Liverpool an increasingly attractive and exciting place in which to work and study.

[27] University of Liverpool, Centre for Doctoral Training in Distributed Algorithms
[28] University of Liverpool, Centre for Doctoral Training in Digital and Automated Materials Chemistry

Contributing to UK capability and competitiveness

3.25 The positive influence of the strategic partnership can also be felt across the UK, notably in its role in enhancing national innovation capability and economic competitiveness.

3.26 Innovations originating from the partnership in Liverpool are exported to markets across the globe, **helping to showcase the UK's innovation capabilities on an international stage** in the face of intense international competition. In this context, it is important to note that Unilever also has global R&D centres in the US, India, China and the Netherlands.

3.27 The volume, quality and digitised nature of the RD&I associated with the partnership is also helping to **position the UK at the vanguard of scientific innovation globally** in the important fields of materials chemistry, brain and behaviour, as well as microbiome research. This supports a growing **policy focus in the UK on supporting innovation-led growth to secure the UK's long-term prosperity**. The cutting-edge technologies developed through the strategic partnership will make a significant contribution to this. However, the commercialisation of advanced new materials can require extended timeframes, which means **the full extent of the MIF's contribution—and that of the broader partnership—to the UK's innovation system and productivity performance may not yet be fully realised.**

4. The partnership's wider contribution

4.1 Beyond economic growth and innovation, the strategic partnership has led to wider social and environmental benefits. Within this chapter, we focus on three key areas of wider impact: **health and wellbeing** outcomes; **environmental and sustainability** benefits; and increased **public understanding and engagement in science and research**.

Health and wellbeing outcomes

4.2 Unilever's products play an important, and obvious, health and wellbeing role, in relation to the cleaning properties of detergents, individual health and confidence arising from deodorants and skin care products, and the ability of a wide range of products to be used by people with skin and other conditions.

4.3 New and improved products deliver added value to the consumer. However, in addition to this, there is also evidence that research delivered through the strategic partnership has led to 'spillover' effects in health and wellbeing: in other words, research findings that are likely to lead to wellbeing benefits in addition to those that can be directly translated into Unilever product development. Collaborative work on the relationship between the skin microbiome and mental wellbeing provides a key example, bringing together work in the Microbiome and Brain and Behaviour areas of research focus:

Microbiome-based wellbeing

- The past couple of decades have seen a significant research focus on the impact of gut microbiome on mental health. However, the role of skin microbiome (the interaction of micro-organisms on the skin) has received less attention.
- Joint research between Unilever and the University of Liverpool has been at the forefront in addressing this gap in knowledge. The launch of the Dove Gentle range in 2018 represented the first use of skin microbiome research in a commercial beauty and wellbeing product.

- Since then, the University and Unilever have developed leading capabilities in microbiome research: Unilever now holds one of the world's largest collections of human skin microbiome data (with over 30,000 samples analysed), and the Microbiome Innovation Centre is a world-leading centre of excellence.

- In 2022, Unilever and the University of Liverpool entered a **Knowledge Transfer Partnership** (KTP) to understand the connection between the skin microbiome and consumer wellbeing.

- Key findings were published in 2025[29]. These established that concentrations of beneficial microbes that live on the skin, particularly Cutibacterium, are linked to psychological wellbeing. Higher levels on the face and underarm were associated with lower stress, and increased levels on the underarm were linked to improved mood. A further study also demonstrated that the scalp microbiome also affects perceived hair and scalp health and wellbeing.

- For Unilever's future product development, this supports a focus on "products that support physical appearance, mental wellbeing and positively contribute to mental health" – recognising that appearance and wellbeing are not independent of each other. The role of the scalp microbiome in conditions such as dandruff and itchy scalp is also now incorporated into the hair care product development process.

- More broadly, the outcomes of the KTP represent a scientific breakthrough which could have broader implications for the understanding of the skin microbiome/ mental health relationship, with scope for further research beyond Unilever itself.

- The KTP also demonstrates the incremental value of collaboration. At the outset, there was already a well-established research relationship between the partners. The project strengthened these, including by supporting linkages between the MIC, the Brain and Behaviour Laboratory and the Centre for Genomic Research within the University; and between the Consumer Science and Microbiology teams within Unilever. Proximity between the partners also helped, with easy access to Unilever's Consumer Testing Centre at Port Sunlight enabling quick and high-quality data collection.

- These factors have strengthened the strategic partnership further and underline the synergies between Port Sunlight and the research infrastructure in Liverpool. The final KTP report notes that combining Unilever's capabilities with

[29] Tyson-Carr, J. *et al* (2025), 'Body-site specific associations between human skin microbiome composition and psychological wellbeing', *British Journal of Dermatology*

the University's scientific expertise enabled fundamental scientific questions to be addressed in an efficient and cost-effective way, creating a "world-first capability that delivered significant breakthroughs".

Source: Unilever; Unilever/ University of Liverpool, Microbiome-based wellbeing KTP final report

Innovation driving positive environmental impacts

4.4 Sustainability is a key focus of Unilever's strategy, and the company has clear targets to reduce its environmental footprint. These include a commitment to net zero emissions across the value chain by 2039, and a reduction in the company's virgin plastic footprint of 40% by 2028, over a 2019 baseline[30].

4.5 Materials innovation will play a central role in the delivery of Unilever's sustainability objectives. This has been the focus of the Cleaner Futures project, currently underway:

Cleaner Futures: Developing next-generation sustainable materials for consumer products

- Cleaner Futures is an £8.8 million research partnership between Unilever, the University of Liverpool and the University of Oxford, and is part of UK Research and Innovation's Prosperity Partnership initiative. Launched in 2021 and running until 2026, the partnership aims to reduce the environmental impact of consumer goods through "disruptive innovation" in the chemical supply chain.
- Many chemicals used in consumer products such as detergents are sourced from virgin petrochemicals and are not biodegradable. Unilever has a strategic target to replace these ingredients with non-petrochemical alternatives. But demand for fossil-derived chemicals continues to rise – and while alternatives exist, these cannot yet be supplied in sufficient quantity. So Cleaner Futures aims to develop new renewable and biodegradable materials, and new routes to make them.

[30] Unilever, Sustainability Goals

- The focus of the research is on new, early-stage technologies to use carbon from renewable sources, such as waste carbon dioxide and sustainable biomass. This requires "entirely new chemistry" to convert these sustainable carbon sources into chemicals and polymers, using digital technology to accelerate progress.

- Significant progress has been made. Patent applications are in progress, and technology with the potential to dramatically decrease polymer testing times is currently being evaluated for industry adoption. Building on research through the project, work is underway to move key technologies closer to commercialisation, for example via the Flue2Chem programme (which aims to convert industrial waste gases into chemicals, and in which Unilever is a founder partner), and EPSRC's Sustainable Chemicals and Materials Manufacturing (SCHEMA) hub.

- Meanwhile, Cleaner Futures is having a wider impact on public policy. Members of the project team formed part of the Royal Society working group focused on the defossilisation of the chemicals industry, and the team is represented on the Circular Economy Taskforce, established by Government to advise on manufacturing sustainability.

- The project built on the established relationship between Unilever and the University: the lead researchers – Dr Ian Howell at Unilever and Professor Matt Rosseinsky OBE FRS at the University of Liverpool have been central to the strategic partnership for many years. Looking to the future, several of the innovations developed through the partnership will continue to be developed by Unilever and the University of Liverpool, with the intention to offer them as 'open innovation platforms' for other sector partners, extending the economic benefits. In the longer term, the outcomes of the project will contribute to Unilever net zero targets by 2039, as well as those of the UK, and will help to place UK science and manufacturing at the forefront of post-petrochemical industry.

Source: UKRI, Cleaner Futures; University of Liverpool; Unilever

4.6 In 2022, the MIF was also awarded £1.3 million from Research England to develop the **Low Carbon Chemistry Lab of the Future**, to help reduce its energy use and carbon footprint, supporting its operational sustainability.

Increased public understanding and engagement in science and research

4.7 The component research centres and assets within the strategic partnership contribute to raising the profile of scientific research, and increasing public and business awareness. In 2024, the Microbiome Innovation Centre hosted the UK One Health Microbiome Conference, bringing together academics, industry scientists, entrepreneurs and investors. As part of the Cleaner Futures project, the University and Unilever hosted a 'Sustainable Carbon for a Net Zero Chemical Industry' conference in 2024, bringing together stakeholders from the third sector and policy community, as well as industry and academia. More recently, researchers at the AIChemy Hub delivered a 'chemistry robot' interactive exhibition at the 2025 Imperial Discovery Day to inspire a new generation of future researchers, and participated in the Liverpool City Region Civic Data Cooperative's Festival of Data in 2026.

4.8 Beyond scientific engagement, collaboration in historical and social research is broadening perspectives on Unilever's history, its role in the development of the Liverpool City Region and its place in global economic and social history. Supporting this, Unilever's Archives hold one of the most important collections of business records in the world. They are designated by Arts Council England as being of "global significance… [due to] the comprehensive nature of the records held in the archive, [which] reflect Unilever's place in world trade"[31]. Unilever's in-house team is accredited by the UK National Archives, a standard that defines good practice and agreed standards[32].

[31] Unilever, Arts Council England designation

[32] Unilever, UK National Archives accreditation

William Lever and the Congo and the Solomon Islands

William Lever (1851–1925) was one of Unilever's founders and a widely recognised industrial reformer. He did much to drive progress on women's rights, workers' wellbeing and other social causes. However, there was illegal use of forced labour and other mistreatments on plantations that his business – Lever Brothers – set up in the Solomon Islands and what is now the Democratic Republic of the Congo.

Unilever commissioned the University of Liverpool to lead an independent assessment of Lever Brothers' activities on the coconut and palm oil plantations in the Solomon Islands and the Belgian Congo between 1900 and 1930. The work undertook a full examination of the archival material held by Unilever to build a clear picture of how the plantations were operated and managed, and was reviewed by an independent panel hosted by the Royal African Society. The research took place between 2021 and 2024, with the final report published in 2025[33]. The report makes an important contribution to the history of colonialism, and the understanding of both the political, economic and social networks which underpinned European imperialism, and the extent and nature of resistance.

The University played an important role in the study: it was an independent partner and also drew on wider expertise linked with the history of slavery and Liverpool's historic role in relation to it, and the research was also accompanied with community engagement in the Liverpool City Region to increase understanding of Lever Brothers' legacy.

There were also innovation outcomes from the research process itself, in exploring the use of generative AI to analyse archive material and broadening connections between the University of Liverpool's Digital Innovation Facility and Unilever.

Source: Unilever; Cho, Cross and Tierney (2025)

[33] Cho, H., Cross, H. and Tierney, J. (2025), *Report on Lever Brothers' Plantations in the Soloman Islands and Belgian Congo, c.1900-1930s*, Unilever/ University of Liverpool/ Royal African Society

5. Implications for the future

5.1 This report has demonstrated that the Unilever/University of Liverpool strategic partnership has delivered a substantial contribution to innovation and economic growth. It is likely that this will continue to cumulate in the future, as research currently underway (for example through Cleaner Futures) comes to fruition.

5.2 Three other conclusions are also important to highlight:

- First, **the partnership is distinctive**. Many cities seek to build 'innovation clusters' based on potentially complementary academic and industrial capabilities, but they are often challenging to realise, partly because they are (initially, at least) dependent on a limited number of projects and people and lack institutional depth; and partly because the partnership is not rooted in a clear alignment of research and commercial interest. The evidence is that the Unilever/University of Liverpool partnership has grown organically, supported by its longevity (and the continued involvement of key leaders over time), and by a clear understanding of shared research interests, which have subsequently expanded into other fields. Consultations with Unilever consistently pointed to the uniqueness of the partnership with the University, which has not been replicated elsewhere. The conclusion is that **the partnership is a key asset in its own right, which is inherently locally rooted in Liverpool City Region, and which is likely to deliver greater benefits to the UK as a whole as a result.**

- Second, **the partnership is dynamic and cuts across research themes.** For the purposes of this study, we considered three areas of scientific focus, relating to advanced materials (the largest and most established of the three), the science of the microbiome, and brain and behaviour – but project activity demonstrates substantial convergence (and the application of advanced digital technologies is of course a central driver of all three). This is supported by the breadth of the strategic partnership across different research areas.

- Third, **there is substantial value gained from a development approach that builds on this distinctiveness and dynamism.** Much of this is encapsulated in the 'Liverpool Model' articulated earlier: the value of the Materials Innovation Factory (for example) comes from its specialist focus (and specialist expertise running throughout the operation including the team of technicians who support activity within the open access labs) and through its ability to co-locate researchers (from Unilever, the University and third parties) where there is a compelling research and commercial rationale for co-location. In

this sense, the MIF is a very different proposition from a more generic innovation centre and is strongly rooted in the Unilever partnership.

Relentless innovation, constant renewal

5.3 The past decade has seen rapid technological change and an acceleration of the sustainability agenda. Consultees noted how world-first innovations are rapidly adapted and adopted elsewhere or superseded by new developments.

5.4 This means that **the need for innovation is relentless, and pace is very important**. This is perhaps especially the case in relation to Unilever's products and markets, given the highly competitive nature of the consumer goods industry and the need to respond rapidly to (and influence) changing consumer demand. Consequently, the process of innovation is important too, in reducing time to commercialisation.

5.5 Sustaining the strategic partnership, and the economic benefits that result will therefore require constant renewal through new project activity and reinvestment in the technologies, talent and specialist enabling facilities to deliver it.

Looking to the future

5.6 In this context, several consultees highlighted the need to build future capacity and leadership for innovation. The partnership has a strong track record in building on success: the MIF for example following on from the effectiveness of the Centre for Materials Discovery.

5.7 Looking to the next stage of development, the University is leading the development of a new Artificial Intelligence Materials Hub for Innovation (AIM-HI). Building on the success of the MIF, this is intended to scale up and diversify the application of AI and automation in materials science, with the potential to support innovation across a range of sectors, including pharmaceuticals, net zero technologies and advanced manufacturing:

AIM-HI

Building on the success of the Materials Innovation Factory and its internationally recognised expertise, the University is planning to develop an **AI Materials Hub for Innovation (AIM-HI)**. This £100 million, AI-driven materials innovation project will form part of a new £111 million, purpose-built chemical sciences facility in Liverpool's Knowledge Quarter, set to open in 2031. Funding for AIM-HI will be secured from multiple sources, including industry.

AIM-HI will harness the opportunities emerging from AI to drive forward materials innovation. It has the potential to deliver up to a ten-fold increase in innovation productivity. This will position the UK as a global leader in the large-scale application of AI to materials chemistry and make a substantial contribution to UK growth and export-led revenues. AIM-HI will unite world-class researchers, industry partners, and government to accelerate breakthroughs in catalysts, advanced energy materials for net-zero, soft matter, and product formulation.

Through open innovation platforms, workforce training, and a national innovation ecosystem centred in the Liverpool City Region (LCR), AIM-HI will transform R&D productivity across the UK's advanced materials sector. It will generate high-value jobs, strengthen regional growth, and deliver long-term economic and societal benefits. With its unique combination of world-class expertise and partnerships, AIM-HI presents a globally significant, game-changing opportunity to drive innovation from Liverpool to the world.

Source: University of Liverpool

5.8 Building on the success of the National Biofilms Innovation Centre, NBIC-Liverpool aims to establish a world-first **Centre of Excellence in Advanced Biofilm Technologies**, combining surface/materials engineering, imaging platforms, high-throughput discovery, AI and machine learning. The University also has a long-term vision to establish a national **Microbiome Centre of Excellence**, offering advanced platforms for multi-omics, complex microbiological models, data science, biobanking, and Good Manufacturing Practice (GMP) manufacturing for live biotherapeutic products.

All these new and planned investments build on the strength of the Liverpool Model, capitalising on sustained industry involvement and leadership and a long record of collaboration.

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