University of Glasgow

PIONEERING MEDTECH INNOVATION

MEET THE INNOVATORS

WORLD CHANGING GLASGOW

We truly believe innovation can change the world, and that has proudly been our mission at the University of Glasgow since our inception in 1451. Our vision of where we want to be is clear: we want our innovation to change the world, for the better and be recognised as an entrepreneurial university.

Our MedTech Innovation Fund, which we launched in September 2024, is just one of the ways we are embedding an entrepreneurial spirit of innovation across the breadth of our organisation.

We have strong foundations to build upon – our research is world leading, we have excellence in our learning and teaching, our global presence of over 200,000 alumni means we are a university connected to the world, and we already generate £4.4 billion of economic impact through university activities.

To succeed we must also invest in creating the right conditions that nurture, support, enable and empower our world changers to deliver on our ambitions. Underpinned by our values, we are creating the foundations for a world-class innovation and entrepreneurial university.

Our Innovation and Enterprise programmes, such as the MedTech Innovation Fund, will enable innovation across our campus and enable our people. We are committed to working in partnership with University Colleges, schools and our academics to put in place the support infrastructure and programmes to accelerate commercialisation and impact.

Thank you for joining us for this MedTech Overview event at the University of Glasgow. We hope you recognise the exciting endeavour and world changing potential behind each of our teams, and that you can join me in wishing them well in their entrepreneurial journey.

Best wishes,

Uzma Khan, *Vice Principal for Economic Development and Innovation at the University of Glasgow*

UNIVERSITY OF GLASGOW INNOVATION

MedTech is a vitally important growth sector for the UK and Scottish economies. MedTech continues to drive advances in medical therapy and healthcare. It is more than technology development.

Making a difference to society means innovation must be coupled with an understanding of patients' needs and clinical use. Accelerating innovation means understanding the complex healthcare system and regulatory requirements.

The MedTech Innovation Fund at Glasgow, with its partnership and collaborative approach, launched in 2024 to support academic entrepreneurs accelerate their innovation journey. In its first year £500k was available from a combination of the UK Government Shared Prosperity Funding (administered by Glasgow City Council); the Scottish Funding Council (SFC) Knowledge Exchange and Innovation Funds; Medical Research Council (MRC) Impact Accelerator Account funds; and a generous private donation from a University of Glasgow alumni.

So far the fund is supporting seven innovation projects and academic teams. It aims to accelerate innovation projects towards commercial and investment readiness. Getting future technologies to market requires a diverse skillset and a broad range of expert and commercial support. Projects were therefore selected and supported by an expert panel comprising university alumni; industry and commercial experts with extensive experience in medical technology and healthcare sectors; and the NHS.

In this brochure we introduce the seven projects and the teams.

MedTech Innovation is part of the University innovation and enterprise programmes designed to promote, enable and accelerate academic innovators take meaningful commercial steps forward. We look forward to working with our colleagues and partners to evolve the next phases of the programme.

Team names above left to right: *Albert Nicholl, Anne Roberts, Prof Stewart White, John Young, Morven Shearlaw, Associate Professor Katriona Brooksbank and Dr. Ron Lennox.*

MEDTECH INNOVATION AT GLASGOW

Funded by UK Government

Scottish Funding Council
Comhairle Maoineachaidh na h-Alba

UKRI Medical Research Council

Kepsoft collaborative is the first social enterprise to spinout from the university. Their mission is to help save lives by providing software and services to better match kidney patients with donors.

In the intricate web of healthcare and life-saving medical procedures, kidney transplants are often a crucial procedure for those suffering from renal disease. A transplant can signify a return to quality of life. The challenge arises when a patient has a willing but incompatible donor. KEPsoft works to solve this problem with a sophisticated software solution designed to optimise kidney exchange programmes (KEPs) – enabling improved access to national and international kidney exchange.

KEPsoft is a testament to how computational skill can make tangible differences to people's lives. Between 2008 - 2024, it is estimated the algorithms led to 600 more kidney transplants taking place, compared to the estimated number that would have occurred had the previous algorithms continued to be used.

Markets ripe for KEPsoft's deployment are primarily Transplantation Organisations (TOs) across Europe. Spain, Italy, and Hungary's national TOs are already set to evaluate KEPsoft, with ambitions to extend its services to the UK and potentially beyond European borders.

Team names above left to right: *Sheena MacCormick (University of Glasgow IP&C team), Dr William Pettersson (CTO), ViJay Luthra (CEO), Professor David Manlove (Scientific Advisor) and Natasha Tian (University of Glasgow, MVLS)*

KEPsoft Collaborative

1. OPTIMISING KIDNEY EXCHANGE PROGRAMMES

THE TEAM

KEPsoft is the brainchild of the Computing Science department at the University of Glasgow. The Company CEO, with personal experience as a renal transplantee, provides strategic insight from his background in global healthcare. The team CTO has a wealth of knowledge as a mathematician, algorithmicist, and software engineer and their Scientific Adviser, has been pivotal in developing algorithms for the UK's KEP since 2007.

MEDTECH INNOVATION FUND SUPPORT

The journey of KEPsoft towards medical device certification has been significantly bolstered by the MedTech Innovation funding. The fund has facilitated the engagement of specialist consultants to assist with key regulatory requirements, including a Technical File and a Quality Management System, facilitating time to market de-risking the proposition for partners.

FINAL OVERVIEW

KEPsoft stands out not just for its technological prowess but also for its social impact. It paves the way for more patients to find compatible donors and receive the transplants that could save their lives.

With the injectable drug delivery market projected at $1.04 Trillion by 2032 (cagr 10.2%), up to 50% of vaccines and biologics are discarded due to cold chain failures, costing billions and limiting access for 2.7 Billion people worldwide.

A transformative solution has been developed at the University of Glasgow – room temperature storage and delivery of biologics using gels. This pioneering project has the potential to disrupt the traditional cold chain system for the storage and delivery of biologics, ultimately improving access to essential therapies across the globe.

The protein stabilisation technology addresses a clear and urgent need in the biological therapeutics and research industries by significantly reducing reliance on cold chain storage and transport, improving protein stability and enhancing accessibility. The technology eliminates refrigeration needs, cutting costs, expanding access, and reducing environmental impact. Savings and impact from the technology will be realised within the broader protein stabilisation supply and value chains, first in the API global supply chain (2023: $247.8bn, 2029: $347.9bn, CAGR 5.9% BCC, 2024) and the BioPharma CDMO global value chain (2023: $128.0bn, 2029: $191.6bn, CAGR 7.0% BCC, 2024).

THE TEAM

The innovation is led by a Professor from the School of Chemistry, and the team has extensive experience with hydrogels and biological macromolecules.
This team also has a track record of commercialising innovation and are supported by a commercial champion, setting a solid foundation for future spinout and investment opportunity.

MEDTECH INNOVATION FUND SUPPORT

The MedTech Innovation fund has been a catalyst for the invention, allowing the team to undertake validation steps and map out a clear regulatory / commercial pathway. The funding has also helped to scope several key target customers, including Therapeutic Biologics Manufacturers, Vaccine Developers, Contract Development & Manufacturing Organisations (CDMOs) and Pre-clinical Antibody Suppliers. These markets need innovative solutions to extend shelf-life, enhance functionality, and eliminate cold-chain dependencies. This groundwork has helped to de-risk the project.
The team is now working to secure further commercialisation support and make necessary spinout preparations.

FINAL OVERVIEW

Room temperature storage and delivery of biologics using gels is groundbreaking technology which the team at University of Glasgow aim to bring to the market and is currently TRL 4-5. The technology disrupts the cold chain system with pioneering innovation that enhances healthcare outcomes globally.

Team names above left to right:
Dr. Simona Bianco
(Research Assistant) and
Dr. Libby Marshall
(Research Associate)

2. INJECTABLE DRUG SYSTEM WITHOUT REFRIGERATION

Across the globe, around 180 million bone fractures occur worldwide per year with 20 million that require surgical fixation. In orthopaedics, the practice of surgery has advanced, yet fracture planning via digital innovation has lagged other areas of clinical practice.

Recognising this gap, new platform technology has been created to leverage cutting-edge digital medicine, including virtual reality (VR), and artificial intelligence (AI) to recreate a patient's fracture in a virtual 3D model.

OrthoVis' target customers include individual orthopaedic surgeons, hospitals and trauma centres, academic institutions and medical device companies. The OrthoVis technology also has applications in other market segments including dental and maxillofacial surgery, spinal surgery, neurosurgery and veterinary surgery. Through the creation of the OrthoVis solution, surgeons can now meticulously plan and rehearse surgeries, addressing the critical needs.

THE TEAM

The OrthoVis team is a combination of clinical, technical, and commercial expertise, including an orthopaedic surgeon and experts from both the colleges of Science & Engineering and Medical, Veterinary & Life Sciences. The team has expertise in computational mathematics and machine learning, critical for product development. In addition, the team has both academic and business strategy contribution, which supports the breadth of requirements for commercialisation.

MEDTECH INNOVATION FUND SUPPORT

The MedTech Innovation Fund has provided support to OrthoVis to undertake comprehensive market evaluations, prioritising the US, Europe, and the UK as key markets. The funding also enhances customer discovery and stakeholder engagement, facilitating product demonstrations. OrthoVis are navigating the regulatory landscape, ensuring compliance and paving a clear, robust roadmap. These activities compliment other support from the University for an AI module, promising to bolster the platform's functionality and generating valuable IP.

Next steps include further refining the intellectual property strategy and developing a minimum viable product (MVP) grounded in user feedback and building strategic partnerships crucial for market access.

FINAL OVERVIEW

OrthoVis have raised circa £350K to date and are on a path to redefine surgical planning, promising to enhance patient outcomes and streamline surgeon workflows. They are between Technology Readiness Level 2&3 and stand poised to transform fracture surgery and beyond.

Team names left to right:
Jon Venthan (commercial champion) and Associate Professor David Shields (Consultant Surgeon, Founder and Chief Medical Officer)

ORTHOVIS

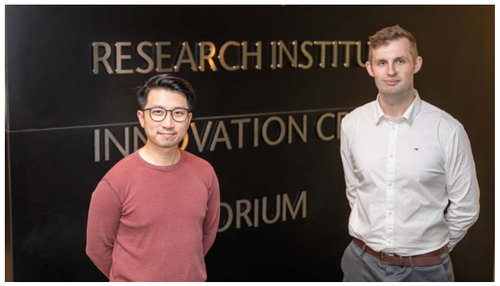
3. 3D PLANNING IN FRACTURE SURGERY

Cardiac Small Vessel Disease (SVD) is a condition that often goes undetected, with patients suffering from symptoms such as chest pain and breathlessness due to the invisibility of small vessels on standard heart scans, resulting in thousands of patients being misdiagnosed every year. SVD is currently difficult to detect without invasive, expensive tests.

The team at University of Glasgow are pioneering a novel software application to tackle diagnosis. The invention uses a machine learning tool to process heart artery images to accurately identify SVD, streamlining diagnosis and offering a safer, faster, and more cost-effective solution. The target customer is specialists at cardiology units and hospital imaging departments. The software is also well-suited for digital diagnostics, medical imaging, and clinical research sectors, offering seamless integration with current platforms and workflows.

THE TEAM

An expert team from the School of Cardiovascular and Metabolic Health are driving this innovation and includes a blend of clinical, technical, and commercial acumen including expert support in model testing and data analysis. There is ongoing contribution from top-tier software engineering and infrastructure design expertise, ensuring the project's technical robustness



MEDTECH INNOVATION FUND SUPPORT

MedTech Innovation funding has enabled the team to move from academic research to a practical clinical tool, supporting collaboration with expert developers to create a regulatory-ready design, helping to build a scalable imaging and data infrastructure to collect and organise angiograms and physiology data from multiple sites. This stage has been critical in translating the machine learning algorithm into a real-world solution that clinicians can use.

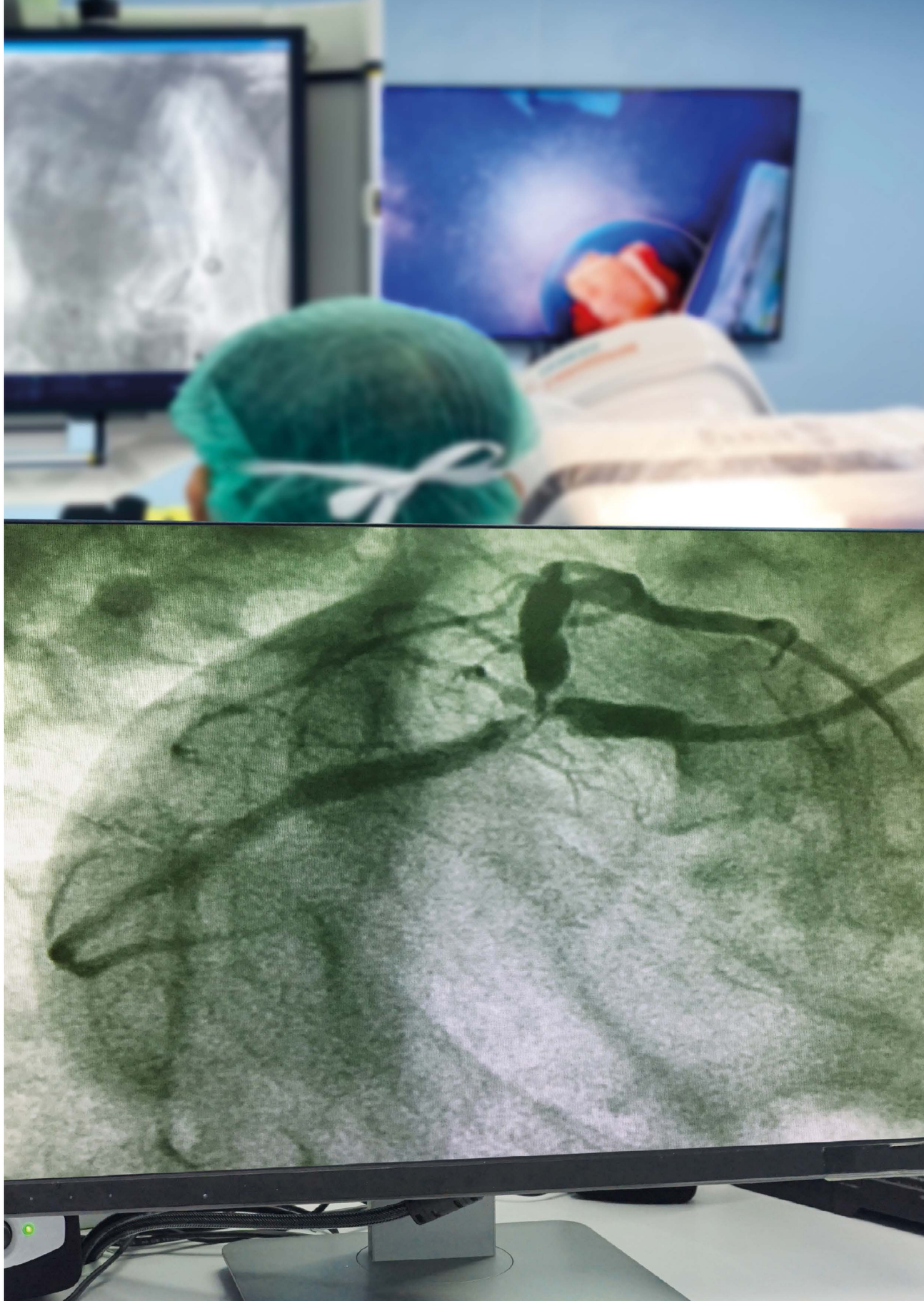
The funding further facilitates the development of operational plans for future integration and licensing with collaborating organisations and industry partners. The team is poised to continue refining the tool and leveraging the new data infrastructure.

FINAL OVERVIEW

This software solution represents a leap forward in heart disease diagnosis, particularly for patients whose conditions are not characterised by blocked arteries. The innovation stands to improve patient care and alleviate the burden on healthcare systems like the NHS.

Team names left to right:
Dr. Dylan Tan (Clinical Research Fellow)
and Dr. Robert Sykes (PI)

4. MACHINE LEARNING TO SIMPLIFY COMPLEX CORONARY SMALL VESSEL DIAGNOSTICS



The landscape of medical diagnostics is on the cusp of a transformative change with the advent of innovative Artificial Intelligence (AI) models. A team of experts from the School of Cancer Sciences have developed a revolutionary AI model that turns pathology images into a self-discovered language of cancer and corresponding paragraphs of AI text.

The model interprets those paragraphs to understand the context and relationship of the tissue. This is an unprecedented approach to image analysis in medicine and unlocks the training of large AI models without human labels, leading to a new generation of clinical tools.

One of the most impactful tools that the model will power is a pan-cancer triage tool. On average, only 73% of people start treatment within the NHS target time of 62 days, and for some cancers it can be as low as 49%. This is leading to poor patient outcomes and having an untold cost in lives and knock-on effects in healthcare economics. Using this new approach, it is possible to rapidly and automatically detect malignancies, reduce time until treatment, improve patient outcomes and mitigate the waiting time crisis in the NHS. Another impactful area where it is being applied is to help discover new targets to assist drug discovery and development.

THE TEAM

This innovation has evolved within the School of Cancer Sciences. The team behind this innovation brings a wealth of expertise to the table, including expertise in AI, cancer research, and digital pathology. They are joined by an expert in biomarker discovery and a practising pancreatic cancer surgeon, in addition to a molecular pathologist with a strong background in biomarker discovery and development.

MEDTECH INNOVATION FUND SUPPORT

The funding has enabled the team to scale the model, applying the technology to 100,000 clinical whole slide images, working with the NHS and Microsoft to achieve this objective. The process to access real clinical data on which to validate the model has been a critical de-risking exercise, which would not have been possible without MedTech funding support. This step is critical as it provides tangible proof of the model's efficacy and commercial viability.

FINAL OVERVIEW

The innovative AI technology developed by the School of Cancer Sciences represents a transformative leap forward in pathology, promising to revolutionise cancer diagnostics and patient care. By enabling rapid, accurate, and self-supervised interpretation of pathology images, this model is set to significantly reduce diagnostic waiting times, improve patient outcomes, and ease NHS pressures. With the critical support from the MedTech Innovation Fund and strategic partnerships, the team's pioneering work brings us closer to a future where AI-powered pathology is standard practice, ultimately saving lives and advancing medical discovery.

Team names left to right: Prof. David Chang (Professor of Surgical Oncology), Dr. Ke Yuan (Senior Lecturer, CSO), Dr. Christopher Walsh (Research Associate, CEO/CTO) and Prof. John Le Quesne (Professor in Molecular Pathology)

TILE

5. REVOLUTIONISING PATHOLOGY WITH ARTIFICIAL INTELLIGENCE

Unravel Health was founded to address a critical gap in comprehensive support for women's health by recognising that hormonal conditions affect 3.1 billion women worldwide and that traditional blood test diagnostics inadequately capture the complexity of hormonal fluctuations that are crucial to understanding women's bodies.

With the licence assigned and exclusive IP, the Unravel team has developed a non-invasive, at-home device that uses saliva to continuously monitor up to 16 biomarkers in real-time.

Unravel's product provides women and clinicians with actionable insights, supporting individualised healthcare decisions. Without this data, these conditions are diagnosed primarily using human judgement, resulting in delays in diagnosis and trial-error treatment.

THE TEAM

The female founders contribute a valuable combination of commercial, product, strategy, medicine and biomedical engineering expertise – with specialist backgrounds in AI-driven disease prediction. It is further strengthened by scientific inventors and advisors at the University of Glasgow with expertise in biosensor technology from the James Watt school of Engineering

MEDTECH INNOVATION FUND SUPPORT

Funds support a critical step in demonstrating the flexibility and potential of the device and its adaptability to a range of medical conditions. The funding also contributes to activities associated with the development of a novel method to measure oestradiol, a pivotal advancement in hormone monitoring technology.

Unravel Health is well positioned to penetrate diverse markets. The direct-to-consumer market empowers women to take charge of their health. The business-to-business market connects with pharmaceutical companies and clinics to enhance personalised treatment options. The business-to-business-to-consumer market seeks to reach customers through strategic partnerships.

FINAL OVERVIEW

Unravel Health is preparing to ensure the Company is manufacture ready. The commercial roadmap focuses on securing lab space to expand biomarker profiles and adopt a multi-omics approach for conditions like perimenopause, migraines, and Polycystic Ovary Syndrome (PCOS). The team is set to refine its pharmaceutical strategy and solidify B2B partnerships.

Co-founders team names left to right: Liza Levy, Veronika Bridgman, and Dr. Alexandra Oti

unravel HEALTH

6. AT HOME MINI-LAB MONITORING MULTIPLE BIOMARKERS FOR WOMEN'S HEALTH

7. PIONEERING VASCULAR ACCESS HEALTH

Cardiovascular disease (CVD) and Chronic Kidney Disease (CKD) remains the single greatest cause of death worldwide. CKD patients have an increased risk of developing CVD which is a major cause of death in this population (17.9 million pA) and has become $100 Bn healthcare problem.

The only cure for CKD is organ transplant, therefore the majority patients progress to requiring thrice weekly haemodialysis sessions. In the USA this End-Stage-Renal-Dialysis population are ~1% of Medicare beneficiaries patients but consume 7% of the entire 1 Trillion Medicare budget. Vascular access is a lifeline for dialysis patients which connects their blood vessel to the machine that cleans their blood when their kidneys fail. Yet 50% of lines block in Year 1 with high complications rates and associated costs. VascuX has developed a platform technology with a focus on Arteriovenous Grafts (AVGrafts).

VascuX is addressing this urgent and critical challenge faced by patients with End-Stage-Renal-Disease (ESRD) due to Chronic Kidney Disease (CKD) – developing the next generation of self-reporting cardiovascular implants. This is a new modality of treatment via a unique sensor system, integrated into vascular grafts. The product not only diagnoses, but treats and predicts graft failure, redefining the paradigm of CKD patient care.

Texas has highest density of CKD-ESRD patients (17,809) in the World with 739 Dialysis centres. The team has identified 89.2% of this cohort are insured and 69% are over 65 years. As a strategic starting point for its pilot programs, VascuX will focus predominantly on the female patient population over 65, who are the largest users of arteriovenous grafts.

Team names left to right:
Ali Alyami (PGR student), Dr. Talha Kirmi (PDRA), Prof. Steve Neale (Co-I), Dr. John Mercer (PI), Joe Purvis (PGR student), Mohammad Nekooeian (PGR student), Nasser Al-Sulaiman (PGR student) and Jiaoran Wang (PGR student)

MARKET OVERVIEW

$12.73B	**$5.4B**
Stent Market	Graft Market
$23.61B	*Serviceable Addressable Market (SAM)*
Endoprothesis Market	
$10.61B	**$1.7B**
Heart Valve Market	AV Grafts Market
Total Addressable Market (TOM)	*Serviceable Obtainable Market (SOM)*

THE TEAM

Experts in cardiovascular and chronic kidney disease from the College of Medical, Veterinary and Life Sciences are leading this innovation. The diverse expertise of the VascuX team is its cornerstone, with vascular biologists, clinicians, bioengineers, and bioelectronic engineers. The team is evolving the regulatory roadmap and 510K submission to the FDA is in progress. The team is also supported with a commercial champion (acting CEO) and an IP manager to support the product development plan. The team have a published Full Health Economic Assessment (FHEA).

MEDTECH INNOVATION FUND SUPPORT

The MedTech Innovation fund has supported the advancement of the VascuX technology, enabling the production of a human-grade version of the device. Funding has also facilitated the completion of the Budget Impact Model and the groundwork for regulatory approvals steps, helping to de-risk the proposition.

FINAL OVERVIEW

VascuX aims to transform the lives of CKD patients, offering a cost-effective solution that resonates with clinicians and alleviates patient anxiety. The VascuX project is a testament to the power of collaboration and innovation in meeting a pressing global healthcare challenge.

My time at the University of Glasgow was exceptionally valuable to establishing my career in the pharmaceutical industry. Getting new health products to market requires a lot of investment, time, and patience. Access to experts, industrial experience and support should never be underestimated. I am delighted to have supported the University with its first med tech innovation programme and to support next generations of medical and healthcare entrepreneurs.

John Young

Retired Group President & Chief Business Officer, Pfizer Inc. A scientist by training, John D. Young has over 35 years of experience in the healthcare industry and brings a wealth of experience in leadership, strategy, business development and commercialisation of innovative medicines. Mr. Young holds a B.Sc. in Biological Science from Glasgow University and an MBA from Strathclyde Graduate Business School.

A FEW THANK YOUS

We would like to thank the experts who supported the first year of the programme and for their valuable contributions and time. A particular thanks to John Young for a generous donation to the programme. His valuable time, expert guidance and kind contribution added to the success of the first year of this programme.

We recognise the efforts across the University to support innovation. Thank you to the University, the College of Science and Engineering, and to the Medical, Veterinary, and Life Sciences College. A thank you to the Centre for Excellence for Trials Collaboration (CETC) and the Digital Health Validation Laboratory (DHVL) for regular engagement and encouragement.

Of course, none of this is possible without the drive and determination of the academic teams. A special thanks to all the academic project leads and their teams, and to all our academic colleagues who stepped forward to apply to the fund.

GET IN TOUCH

To chat about the MedTech Innovation Fund, meet the team, or talk about Innovation and Enterprise at Glasgow please get in touch.

Email: innovation@glasgow.ac.uk