



The Royal College of Pathologists
Pathology: the science behind the cure

Introducing our theme – Science at the heart of blood, transplantation and patient care

Professor Renata Gomes, Chief Scientific Officer of NHS Blood and Transplant, introduces our theme.

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For NHS Blood and Transplant (NHSBT), science and research are not an adjunct to service delivery; they are the foundations on which our public mission rests. Every unit of blood supplied, every tissue and organ offered for transplant, every stem cell collected, every diagnostic decision supported and every emerging therapy translated into practice depends on rigorous science, trusted data and a relentless commitment to improving outcomes for patients, donors and the NHS.

The articles in this collection speak powerfully to that purpose. They show the breadth of modern transfusion and transplantation science: from haematology's central place in medicine to the promise and complexity of cellular and gene therapies; from the use of routine data for creating a learning transfusion system to precision cellular therapeutics shaped by patient experience; and from the emerging possibilities of xenotransplantation to the necessity to ensure safe transfusion for transplant patients.

Together, they remind us that NHSBT is a science and data-led institution. Our work sits at the interface of discovery, clinical practice, population health, logistics and public trust. We are a national organisation, but also a translational one: connecting laboratories with hospitals, donors with recipients, researchers with operational teams and evidence with policy. That connectedness is one of our greatest strengths.

This matters because the challenges before us are urgent. Demand for better-matched blood is rising. Patients need more equitable access to advanced therapies. Transplant waiting lists continue to test the limits of donation and supply. Digital transformation offers opportunities to

understand variation, safety and outcomes at scales previously impossible. At the same time, innovation must remain safe, ethical, inclusive and affordable. Science gives us the tools to respond; data gives us the evidence to act; partnership gives us the means to deliver.

As Chief Scientific Officer, I see our role as enabling science that changes practice. That means supporting excellent research and ensuring discoveries can be implemented across real-world NHS pathways as soon as safely possible to improve patient care. For this ambition to become a day-to-day reality, we must continue to strengthen our strategic research and development infrastructure, build national data assets, embed genomics and advanced analytics into practice, and nurture the scientific workforce that will deliver the next generation of benefits for patients and donors.

Our Chief Executive Officer, Frances O'Callaghan, is equally clear: *"Research, development and innovation are central to NHSBT's future. Executive support for science is essential. It ensures that scientific ambition is aligned with operational priorities, that innovation is connected to service resilience and that patients and donors remain at the centre of every decision. In a system under pressure, science is not a luxury. It is how we improve quality, reduce unwarranted variation, increase equity and make better use of precious resources."*

This is why our partnership with pathology is so important. Pathologists understand that modern medicine depends on the interpretation of complex biological signals. Blood and transplantation are deeply rooted in pathology, which drives some of the most exciting future directions: immune engineering, molecular matching, cellular therapies, haemovigilance, digital pathology, regenerative medicine and population-scale data science.

The Royal College of Pathologists has long championed the scientific disciplines that underpin diagnosis, treatment and prevention. This collection of articles reflects that same spirit. It celebrates science and research that is practical, patient-facing and system-changing. It also challenges us to move faster, translate discovery into benefit, use data responsibly, involve patients and donors meaningfully, and ensure innovation reaches those who need it most.

At NHSBT, our mission is to save and improve lives. Science is how we fulfil that mission today and how we will extend it tomorrow. I hope you enjoy this theme and that it stimulates fresh thinking about the role we all play in advancing science and innovation for patient benefit. Ultimately, scientific research and development are not abstract pursuits: they shape care today and the treatments of tomorrow.

Meet the authors



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WITH SPECIAL CONTRIBUTION FROM MS FRANCES O'CALLAGHAN
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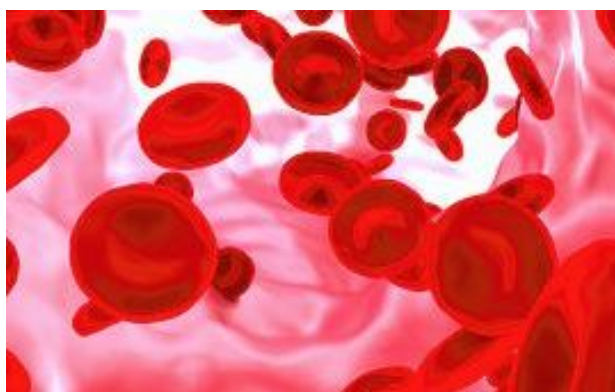
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