How Philanthropy Is Fueling Animal-Free Leukemia Research and the Tools Driving It Forward

An interview with Professor Helen Wheadon, Cancer Biologist at the Paul O'Gorman Leukaemia Research Centre

Overview

Philanthropic fundraising has played a pivotal role in enabling the Paul O'Gorman Leukaemia Research Centre at the University of Glasgow to expand its capacity and deepen its commitment to animal-free research. Support from donors including major donations by the Paul O'Gorman Foundation, Kay Kendall Leukaemia Fund (Sainsbury Family Charitable Trust), and the Howat Foundation helped fund an additional floor and essential equipment dedicated to leukemia research, giving the team more space to pursue pre-clinical studies using patient samples and bioengineered models rather than relying on animal models.

Critically, that funding has brought in the technologies that drive the research forward. This has been especially important in bone marrow research, where disease biology is difficult to replicate in mice. Tools such as the Incucyte® Live-Cell Analysis system now allow the team to run complex experiments in smaller sample groups and capture more physiologically relevant data in real time, turning philanthropic investment directly into scientific capability. Collaboration with NC3Rs, CR-UK and EPSRC has further supported the team's efforts to refine and advance animal-free approaches.

Together, these developments are helping the center move closer to more relevant, patient focused leukemia research and future therapeutic progress.



Questions and Answers

Animal-free Research Ambition

Why is advancing animal-free research such an important priority for your team?
Advances in bioengineering are enabling us to replicate the complexity of the bone marrow by incorporating the different cell types, and mechanical and structural components, which support blood production. By developing these novel humanized models, we can more accurately study disease initiation, disease progression, and leukemic stem cell (LSC) persistence, especially following drug treatment.

What makes leukemia and bone marrow biology particularly challenging to model using animal systems?
Leukemia is primarily studied using genetically modified mouse models, and patient-derived xenograft models in immunocompromised mice. There are many physiological and genetic differences between these animals and leukemia patients, with primary leukemia cells displaying inconsistent engraftment in mice. Because of these differences, 90% of therapies fail clinical trials. This highlights the potential for novel humanized models as a useful addition to the drug discovery pipeline, and potentially as a partial or full replacement for animal models as the technology matures.

How are you using *in vitro* and bioengineered models, such as spheroids, to better reflect the biology of blood cancers?
We have developed three different humanized *in vitro* models to study leukemia. The first involves bioprinting using alginate/gelatine gels to embed stromal cell spheroids and leukemic cells within the scaffold. It has recently been published and demonstrates proof-of-principle results for acute myeloid leukemia (AML) (DOI: 10.36922/IJB026190172). The second model is a complex microfluidic design which will enable researchers to model two different leukemia niches in one system. The third model currently under development is a collaboration with Dr. Amy Naylor (University of Birmingham) to repurpose a self-structuring bone model to study leukemia and solid cancer bone metastasis. These projects have been funded by the NC3Rs, CR-UK and EPSRC.

How does this approach support more relevant testing on patient samples and help move towards personalized treatment strategies?
These models will enable the study of a very small number of primary cells from individual patients over extended periods, providing a powerful tool to investigate mechanisms of LSC persistence following drug treatment. Ultimately, this will enable researchers to uncover underlying mechanisms and identify new therapeutic targets for different leukemias, leading to improved long-term outcomes for patients.

Enabling Technology

How important is the Incucyte® Live-Cell Analysis system to your research workflow?
The Incucyte® was purchased using funds from the Joan Snodgrass Endowment. This has been transformative, as we are now able to image cells in real time, which allows us to monitor cell-to-cell interactions and responses to drug treatments over several days without disturbing the cultures.

What advantages does the Incucyte® system offer when working with complex biology in smaller sample groups?
The technology and available products for labelling the different cells enable us to study complex biology with meaningful biological outputs such as changes in proliferation, cell cycle, and cell survival.

How has live-cell analysis supported your work in studying suspension cells and developing more physiologically relevant models?
It has provided a powerful tool to study cell behavior, metabolomic dependencies and cell death when screening drug combinations.

Philanthropic Impact

How has philanthropic fundraising enabled the Paul O'Gorman Leukaemia Research Centre to expand its research capacity?
Fundraising is vital in supporting our research by providing resources to buy new equipment, sustain and upgrade our current equipment and enabling us to support early career researchers to develop independent avenues of research through our pilot grants. Funds are also used to bridge salaries when waiting for grant funding outcomes through our 'Value in People' initiative.

How has fundraising helped accelerate your ability to pursue more pre-clinical, patient-focused research?
Fundraising has enabled us to purchase equipment to ensure we have state-of-the-art facilities to support our research, especially imaging and molecular biology analysis technologies. This has led to the establishment of a cell banking facility on site, enabling us to carry out pre-clinical testing on primary patient leukemia cells.



"Tools such as the Incucyte® Live-Cell Analysis system now allow the team to run complex experiments in smaller sample groups and capture more physiologically relevant data in real time, turning philanthropic investment directly into scientific capability."

Professor Helen Weadon
Cancer Biologist at the Paul O'Gorman Leukaemia Research Centre

Clinical Relevance and Future Outlook

What unmet need in leukemia research is your center most focused on addressing?
Finding new therapies to target the mechanisms provided by the bone marrow microenvironment, which protect LSCs. If new combination therapies can be developed to eliminate the LSCs, we can prevent disease reoccurrence. We also focus on finding more targeted treatments that are better tolerated by patients, providing better management of their disease and improved quality of life.

How does your work aim to bridge the gap between basic research and meaningful patient benefit?
Our center has an excellent track record of conducting pre-clinical research which has led to clinical trials. We have strong links with industry, the NHS and the clinical trials unit.

What would you say to supporters about the impact their fundraising is having on the future of leukemia research?
We are extremely grateful; without your continued support, this important research would not be possible.

Conclusion

Philanthropic support is helping to reshape the future of leukemia science. By enabling a more ambitious, animal-free approach, this investment is allowing the Paul O'Gorman Leukaemia Research Centre to pursue research that is more human-relevant, more precise, and more closely aligned with the needs of patients. From expanding the research space to supporting advanced technologies and collaborative learning, this funding is helping the team move faster and think differently. The result is not only stronger science, but also a clearer path toward better discoveries, better models, and ultimately better outcomes for people affected by leukemia.

Friends of the Paul O'Gorman
Leukaemia Research Centre Glasgow

Charity number SC004401

Professor Helen Wheadon:



I am a stem cell biologist and translational cancer research scientist with a successfully funded portfolio of multi-disciplinary peer-reviewed research, which spans over 30 years. During this time, I have developed model systems to investigate the initiating steps involved in leukemia development and how the bone marrow microenvironment confers chemoresistance. I am involved in several multidisciplinary projects and collaborate with scientists, industry, NHS, engineers and clinicians. I play an active role in training the next generation of scientists, directing postgraduate teaching and research activities. I am also passionate about science communication and the 3Rs.

Germany
Sartorius Lab Instruments GmbH & Co. KG
Otto-Brenner-Strasse 20
37079 Goettingen
Phone +49 551 308 0

USA
Sartorius Corporation
3874 Research Park Drive
Ann Arbor, MI 48108
Phone +1 734 769 1600

For further information, visit
sartorius.com

Specifications subject to change without notice. *2026 All rights reserved. All names of Sartorius products are registered trademarks and the property of Sartorius AG and/or one of its affiliated companies.
Helen-Wheadon-Interview-2608-en-Sartorius. Status: 08 | 2026