

BREAST CANCER UK

SCIENCE STRATEGY 2025-2028

EXECUTIVE SUMMARY

Around 56,000 people are diagnosed with breast cancer each year in the UK. Historically, breast cancer diagnosis and treatment has attracted a large proportion of both funding and education, however the focus on prevention of the disease is now starting to come to the forefront.

Breast Cancer UK has used global scientific studies to estimate that at least 30% of breast cancer cases may be preventable through altering modifiable lifestyle factors. Many risk factors linked with breast cancer susceptibility cannot be altered including ageing and being born female, however, many modifiable factors also contribute to risk, these are those factors that are generally within an individual's control, such as physical activity or alcohol consumption. The evidence for the contribution of lifestyle to risk of developing breast cancer is well supported, however there is increasing evidence that demonstrates a role for our environment when considering risk. Breast Cancer UK is proud to work across all breast cancer risk factors, including exposure to environmental chemicals and how they may affect risk.

Having invested over £700,000 in our scientific research programme to date, we will maintain our focus on supporting research into the potential environmental risk factors associated with breast cancer. In addition to our smaller grants, we will be maintaining our support for early career researchers over the next three years through our Career Development Award, focussed on environmental chemicals and breast cancer risk. Towards the end of this strategic period, we will begin to work on a new consortium model for driving funding in research that spans across environmental chemicals and health. Furthermore, in our funding programme, we will develop a new offering which will support Travel Awards for early-stage breast cancer researchers.

We will continue to grow the breadth of scientific reviews we have authored and will begin to measure the impact these comprehensive reviews have on the scientific community. Our work on growing the population of scientists interested in breast cancer prevention continues, with our landmark conference focussed on breast cancer prevention, due to take place in 2025 and 2027.

Overall, our Breast Cancer UK Science Strategy 2025-2028 will enable dynamic investment through our grants programme, deliver novel knowledge on both chemical and lifestyle-associated risk factors as well as grow our scope and reputation within the field of breast cancer prevention.

INTRODUCTION

Breast cancer is the second most common cancer diagnosed worldwide. Approximately 56,000 people are diagnosed with breast cancer in the UK each year¹. Today, if born after 1960, the chance of developing breast cancer as an average UK female is 1 in 7². The age standardised incidence rate of breast cancer (which accounts for differences in the age structure of the populations being assessed globally), is one of the highest globally for UK women³. Although much rarer, with a risk of less than 1 in 100, men can develop breast cancer too, with around 400 men diagnosed each year in the UK⁴.

Breast cancer is a complex disease with many subtypes and there are many risk factors associated with its development. Whilst much attention is given to genetic susceptibility to breast cancer, such as *BRCA* gene mutations, the proportion of breast cancers related to these factors is limited, up to 10%⁵. Many risk factors linked with breast cancer susceptibility are intrinsic including ageing and being born female, however, many modifiable factors also contribute to risk, these are those factors that are generally within an individual's control, such as diet, physical activity and alcohol consumption⁶. The evidence for the contribution of lifestyle to breast cancer risk is well supported by large scale scientific studies⁶ however there is increasing evidence that demonstrates a role for our environment when considering risk⁷. Environmental risk factors, such as exposure to Endocrine Disrupting Chemicals (EDCs), may contribute to increasing the risk of breast cancer however mirroring the large-scale scientific research that has been comprehensively completed for lifestyle factors is challenging within this complex and demanding area of science.

According to scientific literature from global studies, at least 30% of breast cancer cases could be prevented through modification of lifestyle factors⁸. We estimate at least 30% as despite many risk factor studies looking at lifestyle factors such as weight and alcohol consumption, no studies to date have included all potential environmental factors in their assessments of risk. We are the only UK charity that focuses on the entirety of breast cancer prevention, including both lifestyle and environmental factors.

OUR SCIENCE MISSION

Breast Cancer UK's vision is a world where everyone is empowered to reduce their breast cancer risk. We will do this by leading a movement to empower individuals, advance scientific research, and reshape policy to reduce breast cancer risk for all.

The Science Strategy sets out our strategic priorities within the scope of our mission and vision. The overarching **key aims** of Breast Cancer UK's scientific strategy are to:

1. **Invest in research into the environmental causes of breast cancer to bolster research in this underfunded area**
2. **Explore research that increases our knowledge of modifiable breast cancer risk factors linked with lifestyle to inform the public and key stakeholders.**
3. **Grow our reputation within the field of breast cancer prevention with stakeholders**
4. **Widen our scope of collaboration and impact through grants and relationship building**

These strategic aims are mapped into our strategy to allow for clarity on which areas of work relate to which aim.

WHERE ARE WE NOW?

BREAST CANCER UK'S GRANT FUNDING PROGRAMME

Breast Cancer UK has invested over £700,000 to scientific research through our science programme grants over the past 12 years. Breast cancer prevention is an underfunded area of science in the UK; much of the general landscape of funding from UK Research and Innovation (UKRI) and other charities has emphasised novel treatments with a view to increasing patient overall survival. Breast cancer patients have benefitted greatly from the outstanding research conducted, meaning 5-year survival of the disease is now around 85%, greater than many other cancers⁹. Whilst new and modified treatments have extended survival, our focus at Breast Cancer UK remains to reduce the risk of developing the disease.

In 2023, we altered our funding format from an open call around breast cancer prevention and chemical risk, through to a structured two stream offering. The first stream, known as our Foundation Award, supports anchoring of new investigators in the area of chemicals and breast cancer prevention. Applicants are required to be within 12 years of their PhD being awarded. Funding has been available for up to 4 years for staffing, studentships, equipment and consumables but not overhead costs. Alongside the proposed funding for research, Breast Cancer UK offers a career coaching programme for the duration of the grant. The second stream, known as our Seed Award, is a flexible grant which could be utilized to top-up funding for a project that was close to completion, to obtain a specific piece of equipment or to fund a pilot project that was focused on chemicals and breast cancer risk. Similarly to the Foundation Award, funding is available to cover staffing, equipment and consumables but not overhead costs.

We altered our 2023 funding call with 3 main intentions:

- To widen the interest amongst academics in breast cancer prevention.
- To better utilise our available funding to create larger impact.
- To better support new investigators and early career academics but also retain the funding of more established scientists in the area of breast cancer prevention.

SCIENCE REVIEWS

Currently, we have 21 scientifically evaluated literature reviews on a range of subjects related to breast cancer risk. Our comprehensive reviews are focussed on a variety of subjects that may impact breast cancer risk including but not limited to the microbiome, bisphenols, phthalates, fibre and physical activity. Our information production process remains robust with at least 2 members of our independent science panel reviewing content and giving feedback.

OUR SCIENCE GOVERNANCE

Our science programme is enabled through various processes and procedures to ensure due diligence and efficiency within the department. Our independent science panel (further details

within Quality and Integrity in our Science Programme) reviews all of our in-house produced science reviews and currently also completes peer reviews for our grant funding round. The Science and Health Education (SHE) Committee oversees all of our work within the team and has the final say on funding applications post peer review.

WHERE ARE WE GOING?

BREAST CANCER UK'S GRANT FUNDING PROGRAMME (AIM 1; 3; 4)

At Breast Cancer UK, we are committed to putting prevention first, through our public information and relations work, policy work and importantly, through funding academic teams to investigate areas of breast cancer prevention. The mainstay of this has been through small to medium grants awarded for laboratory-based research, which has generally been focused on endocrine-disrupting chemicals (EDCs). In our 2025-2028 strategy we will not limit funding calls specifically to endocrine disrupting chemicals, but to all environmental chemicals and toxicants that may influence breast cancer risk.

Whilst our public information and outward-facing website discusses chemicals and lifestyle factors that may influence breast cancer risk, our research grants have to date focused on chemical risks; we will keep this focus for 2025-2028. We are the only grant-awarding body in the UK that gives awards specifically to investigate chemicals and their effect on breast cancer risk. During our successful Breast Cancer UK Prevention Conference in June 2023, it was highlighted by several eminent scientists, from both lifestyle and chemical research backgrounds, that there is an unmet need to gain more comprehensive data on EDCs and the role they play in breast cancer risk. Academics at our conference suggested a focus on larger studies that provide more power to fuel our understanding of EDCs' effects on breast tissue. We recognise that substantial cohort, longitudinal studies that span multiple countries present a challenge in prevention research, with the cost of such an approach being extremely high. With this in mind, and with our current available funding, we are utilising a two-phased approach, as detailed below:

Phase 1 – *Underway*

We will maintain our overarching focus on our environment and breast cancer risk, particularly in reference to EDCs, but also other environmental contaminants that may affect breast cancer risk.

Career Development Award (previously known as Foundation Award)

Our previous offering of Foundation Award will be modified to a Career Development Award, this new title better reflects the nature of the funding available.

The purpose of the Career Development Award is to anchor new investigators in the area of chemicals and breast cancer prevention, the impact of which is noted in Table 1. Applicants to the Award will be measured as to their stage of career through several factors including:

- Applicant has not received career development funding or funding in excess of £100,000 previously (from any source).
- Applicant demonstrates an upward trajectory and career progression since PhD being awarded.
- Applicant has their own unique research plan.
- Applicant can demonstrate evidence of leadership/transition to independence for example through teaching and supervising students or being awarded small amounts of funding.

Alongside the proposed funding for research, Breast Cancer UK will offer a career coaching programme for the duration of the grant, this is externally sought from an accredited professional.

Table 1. Impact analysis of the Career Development Award.

Short term impact: Delivery by 2028	Support basic science research in the area of EDCs and breast cancer prevention. Promotion of our Breast Cancer UK scientific programme to supporters and scientific community.
Mid term impact: Delivery by 2030	Career development of EDCs and breast cancer risk-focused researcher, supporting their progression as an independent researcher in breast cancer prevention.
Long term impact: Delivery by 2035	New research groups focused on breast cancer prevention that will then go on to gain wider-scope funding, potentially in collaboration with other research groups, forming breast cancer prevention networks.

Seed Award

The purpose of the Seed Award is flexible, it can be utilised to top-up funding for a project that is close to completion, to obtain a specific piece of equipment or to fund a pilot project that is focused on chemicals and breast cancer risk. The impact for the Seed Award is detailed in table 2.

Table 2. Impact analysis of Seed Award.

Short term impact: Delivery by 2028	Support small-scale basic science research around EDCs and BC prevention.
Mid term impact: Delivery by 2030	Contribute to pump-priming research which leads to wider funding or output of a project such as journal article (BCUK acknowledged).
Long term impact: Delivery by 2035	Knowledge of BCUK as a funding body in academic settings. Supporting the initial idea in a large-scale study focused on BC prevention.

Travel Awards

As a new offering, Breast Cancer UK will fund travel awards for students who are currently studying a PhD, MD, MPhil in breast cancer scientific research. We will encourage applications from researchers investigating breast cancer prevention, this will be offered from FY26/27 onwards.

Phase 2

Following the rollout of phase 1 in 2023-2024, there will be a second, longer-term phase to the realignment of funding which will begin in FY27/28. This phase involves collaboration with other interested charities/NGOs to provide a larger funding collective focused on EDCs and BC risk. Working collaboratively with other groups will align our common goals and secure a network on which available funds may be pooled for an agreed, specific purpose. The proposed **CHoICE** (Consortium for Health Impacts of Chemical Enviro-toxicants) cluster will involve other UK, European and international NGOs with the aim of providing both a platform for expertise to be shared and a place in which funding from multiple small NGOs can be pooled for research groups/networks to apply to. The scope of the consortium in terms of focus is away from breast cancer alone and will instead focus on health impacts of environmental chemicals more generally, it is hoped with a generalised approach at this level, we will attract a variety of interested parties which may allow for streamlined funding avenues in the future, as noted in Table 3. By shifting the focus from breast cancer alone to wider health effects this will impact 2 main areas, one to aid attracting interest in the consortium and two, to scale up the general research on the health impacts of EDC exposures.

Table 3. Impact of Breast Cancer UK led consortium known as CHoICE.

Short term impact: Delivery by 2027	Identify NGOs and others with commonalities to Breast Cancer UK strategies.
Mid term impact: Delivery by 2029	Develop a UK-European network of groups who are interested in health impacts of EDCs/chemicals.
Long term impact: Delivery by 2035	International consortium focused on health impacts of chemical toxicants, with branches focused on cancer, cardiovascular diseases, neurodegenerative diseases and others.

SCIENCE REVIEWS (AIM 2, 3)

We will continue to deliver our own research through the development of in-house published science reviews authored by Breast Cancer UK Science and Health Education team members. We will retain our basic information production workflow (Science Review>Key Fact Sheet).

We will also measure the impact of our in-house authored content through watermarking of our reviews, with digital object identifiers (DOI). This will enable tracking and observation of where our work is cited.

QUALITY AND INTEGRITY IN OUR SCIENCE PROGRAMME

PATIENT INFORMATION FORUM (PIF) TICK (AIM 3)

Breast Cancer UK is proud to hold Patient Information Forum Tick accreditation, our publications follow strict criteria to ensure clarity, reliability and scientific accuracy. As a charity, our underpinning ethos is that of an evidence basis, and we are supported in all of our messaging by science, this will continue throughout this strategic period.

ANIMAL-FREE RESEARCH (AIM 3)

Historically, our funded research has been animal-free, this will continue as our area of funded research does not require the utilisation of animals. Therefore, we at Breast Cancer UK will only consider funding for research which relies on Replacement Methods of testing. We are in support of the AMRC's stance on animal testing.

THE INDEPENDENT SCIENTIFIC REVIEW PANEL (AIM 1; 2; 3; 4)

The Independent Scientific Review Panel (herein referred to as the science panel) was established in September 2016, to strengthen Breast Cancer UK's science and grant funding programme. Currently, it consists of members with a range of expertise in areas including medical oncology, toxicology, breast biology, genetics, pharmacology, EDCs, nutrition and exercise physiology. The panel is established to offer scientific advice, expertise and opinion to Breast Cancer UK staff and trustees.

The main duties of the panel are to peer review research grant applications and scientifically evaluate Breast Cancer UK's science-based literature. Grant applications are reviewed by at least two panel members, who are asked for an overall assessment score and details of the application's strengths and weaknesses. Science panel members then meet further in the grant process to evaluate and assess peer reviews and applications, this is known as the Grants Committee. The Grants Committee makes recommendations to the Science and Health Education (SHE) Committee (board sub-committee) on which applications are suitable for funding. The SHE Committee is strongly influenced by the peer review and Grants Committee, however the SHE Committee ultimately makes decisions on funding, the process for our grant funding is demonstrated in Fig.1.

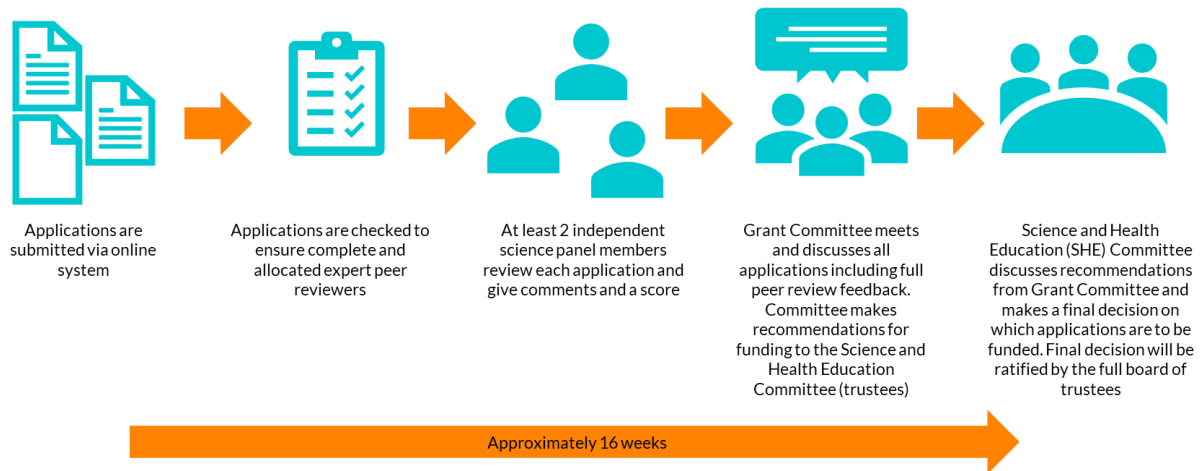


Figure 1. Process of Breast Cancer UK grant funding. Once submitted, grant applications go through rigorous peer review and committee stages prior to funding decisions being made, this process takes approximately 16 weeks to complete.

Panel members with expertise in the relevant discipline evaluate science-based literature produced by Breast Cancer UK's Science and Health Education team, using a detailed evaluation form which invites comment on all scientific aspects of the literature. This is then taken into our information production process and actioned to ensure the review is accurate, reliable and robust.

PUBLIC ENGAGEMENT PANEL (AIM 2; 3; 4)

In 2024 we successfully launched our Public Engagement Panel (PEP), who are a group of volunteer members of the public that review our scientific content. The PEP regularly reviews our key fact sheets that are available on our website and meets face to face on an annual basis. Face to face meetings with the PEP presents a constructive opportunity for Breast Cancer UK to gather feedback and explore ideas for future content. Our PEP has been extremely valuable in enabling public and patient involvement within the charity, with some of our members having lived experience of breast cancer.

We will further develop and expand the Breast Cancer UK PEP over the next 3 years, this will involve further active recruitment to the panel but will also see the expansion of the remit of PEP towards reviewing the lay content of our grants and having input on funding decisions.

ASSOCIATION OF MEDICAL RESEARCH CHARITIES (AMRC) (AIM 3; 4)

In early 2024 we attained Introductory membership to the Association of Medical Research Charities, as part of our strategic work to increase our collaboration across organisations, we will apply for Full membership by January 2026.

FACILITATING AND DEVELOPING COLLABORATIONS (AIM 3; 4)

Breast Cancer Prevention Conference

Our Breast Cancer Prevention Conference is the flagship biannual event (2025, 2027 onwards) in breast cancer prevention research that encompasses all breast cancer risk factors and brings together scientists from across the globe.

We gather leading experts, academics, professionals, students and charity members to discuss the latest developments in breast cancer prevention, identify research gaps and encourage more research in this field.

The Conference has previously held two main themes: environmental chemicals and lifestyle factors influencing breast cancer risk, this will be maintained for the period up to 2028. Each day is split into 4-5 themed sessions which include presentations from world-leading scientists on their latest research, interactive discussions and flash poster talks from students.

There are opportunities for organisations and businesses to sponsor our conference, this enables possible collaboration and fundraising between Breast Cancer UK and industry, as well as strengthening the credibility and reputation of the Conference.

These events are a great opportunity for us to network and form new relationships with individuals, research groups and organisations with a keen interest in breast cancer prevention. We will network with speakers and delegates across the two days to develop our relationship and investigate potential for collaboration/partnerships in the future.

CONCLUSION

In summary, the initial phases of our Science Strategy are to evaluate and measure how our investments in science are helping our overall organisational strategy, with the latter stage of this period dedicated to furthering our relationship building, primarily through the development of a consortium.

Overall, our Science Strategy 2025-2028 will enable dynamic investment through our grants programme, deliver novel knowledge on both chemical and lifestyle-associated risk factors as well as grow our scope and reputation within the field of breast cancer prevention.

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