

## Press Release

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### First results of the European AURORA study: towards a better understanding of the molecular changes driving metastatic breast cancer



The comprehensive analyses of data from the first 381 patients included in the AURORA research programme have revealed important molecular and clinical features that shed more light on metastatic breast cancer (MBC) and how it evolves. The detailed results have just been published in *Cancer Discovery*, a journal of the American Association for Cancer Research.

AURORA is an international academic research programme based on molecular screening and is dedicated to improving our understanding of metastatic breast cancer.

It is unique with its large collection of matched primary and metastatic tumour samples, obtained from patients either at the diagnosis of metastatic disease or after one line of treatment, as well as its high-quality clinical data collection. **Using these samples and data, researchers can study the molecular changes that occur when breast cancer first starts to spread, and throughout the evolution of metastatic disease.**

So far, researchers have identified molecular changes that are more common in metastatic samples. These include mutations in driver genes (in 10% of the samples) and in copy number variations (in 30% of samples). These findings could lead to the future development of new treatment strategies for patients with MBC.

The programme has already generated what is to our knowledge **the largest dataset of RNA sequencing (RNAseq) in MBC**. The analyses of RNAseq data from paired primary and metastatic samples from the same patients showed that, in 36% of the cases, the breast cancer intrinsic subtype changes between the primary and the metastatic disease, usually towards a more aggressive form. This may have treatment implications and deserves further assessment.



The analyses also indicated that metastases expressed fewer immune-related genes and had a different immune cell composition, which may create a microenvironment more favorable to the development of metastases.

The analysis of how long patients survived with the disease showed that those with hormone receptor-positive (HR+) HER2-negative breast cancer who also had high tumour mutational burden (TMB) in their primary tumours had both shorter overall survival and shorter time to relapse, indicating that **TMB is an independent poor prognostic factor**.

Finally, researchers also found that more than 50% of patients had molecular changes that could be matched with existing targeted therapies, highlighting **the potential impact of molecular screening in the management of MBC**.

These findings will be further validated in the full cohort of AURORA patients. To date, **AURORA is the largest molecular screening programme** involving paired biopsies, blood samples, and a rich set of clinical and molecular data collected longitudinally from patients with MBC. **It represents a tremendous logistical effort and a valuable resource** that could support the generation of hypotheses for new treatment strategies.

“This study offers a unique opportunity to generate robust findings that will help us better understand the evolution of metastatic breast cancer, which is still the leading cancer-related cause of death among women worldwide. True to its name, AURORA will bring light to the dark landscape of advanced breast cancer”, says **Dr Martine Piccart**, the initiator of the study.

“AURORA is a large collaboration effort to which patients contributed massively with their time and samples. The impact of the clinico-genomic database and rich biobank will empower future research on metastatic breast cancer”, explains **Dr Philippe Aftimos**, Co-Principal Investigator of the programme and Clinical Trials Development Leader at the Institut Jules Bordet in Brussels, Belgium.

“The knowledge that is being generated within AURORA paves the way towards the development of new treatment strategies for patients with metastatic breast cancer. We are firmly committed to continue this effort so that our patients may live longer and better in the near future”, says **Dr Mafalda Oliveira**, Co-Principal Investigator of AURORA, Clinical Investigator at the Vall d’Hebron Institute of Oncology in Barcelona, Spain, and member of the Executive Board of the SOLTI Breast Cancer Research Group.

### **The burden of metastatic breast cancer**

It is difficult to know exactly how many cases of breast cancer will eventually metastasize to other parts of the body, but a recent estimate puts this at about 30%<sup>1</sup>. This advanced form of the disease is responsible for the great majority of breast cancer deaths.

MBC is more difficult to treat and currently remains essentially incurable, and whilst some individuals live much longer than others with the disease, we do not understand why.

In 2020 approximately 685,000 people in the world died from breast cancer<sup>2</sup>.

**AURORA: a large academic research study**



AURORA was launched by BIG in 2014 and involves over 60 hospitals and cancer centres from 11 European countries. So far, it has included 1,150 patients, and an ambitious plan to include additional patient populations with unmet needs such as triple negative breast cancer is now underway.

“This pan-European academic study exploring the genomics of metastatic breast cancer is a testimony to the commitment of patients, researchers and clinicians, and the not-for-profit funding bodies and individual donations that have made it possible. In particular, we are grateful for the major support we receive from the USA-based charity Breast Cancer Research Foundation, which shares our vision and supports a sister programme in the USA.” **Prof David Cameron**, BIG Chair.

The AURORA programme is being led by BIG in collaboration with the Clinical Trials Support Unit of the Institut Jules Bordet (IJB-CTSU) and Frontier Science (Scotland) Ltd.

### Funding

AURORA is a purely academic study made possible by generous contributions from the Breast Cancer Research Foundation®, Fondation Cancer (Luxembourg), NIF Foundation, Barrie and Deena Webb, Candriam, Fondation Futur 21, Sogerim, Think Pink Belgium (SMART Fund) and many individual donors. AURORA has also been supported by the Fund Friends of BIG, managed by the King Baudouin Foundation.

### Key figures:

**1,150 women and men** with advanced (metastatic) breast cancer have already been enrolled in AURORA

**About 30,000** blood and tumour tissue samples will be collected in total

**411 genes** are being analysed in primary tumours and in metastatic tumours

**11 countries** are involved (Belgium, Germany, Iceland, Italy, Luxembourg, Portugal, Spain, Sweden, Switzerland, United Kingdom and Austria)

**+60 hospitals** are participating in the study

### About Breast International Group (BIG)

The Breast International Group (BIG) is an international not-for-profit organisation for academic breast cancer research groups from around the world, based in Brussels, Belgium.

Global collaboration is crucial to make significant advances in breast cancer research, reduce unnecessary duplication of effort, share data, contribute to the faster development of better treatments, and increase the likelihood of cures for patients. Therefore, BIG facilitates breast cancer research at international level, by stimulating cooperation between its members and other academic networks, and collaborating with, but working independently from, the pharmaceutical industry.

In 1999, BIG was founded by Martine Piccart and Aron Goldhirsch with the aim to address fragmentation in European breast cancer research. Research groups from other parts of the world rapidly expressed interest in joining BIG and, two decades later, BIG represents a network of over 50 like-minded research groups from around the world.



These entities are tied to several thousand specialised hospitals, research centres and world-class breast cancer experts across approximately 70 countries on 6 continents. More than 30 clinical trials are run or are under development under the BIG umbrella at any one time. BIG also works closely with the US National Cancer Institute (NCI) and the National Clinical Trials Network (NCTN), so that together they act as a strong integrating force in the breast cancer research arena.

BIG's research is supported in part by its philanthropy unit, known as **BIG against breast cancer**. This denomination is used to interact with the general public and donors, and to raise funds for BIG's purely academic breast cancer trials and research programmes.

For more information, visit [www.BIGagainstbreastcancer.org](http://www.BIGagainstbreastcancer.org)

### **About the Institut Jules Bordet**

An integrated multidisciplinary centre, unique in Belgium, Institut Jules Bordet is an autonomous hospital devoted exclusively to cancer.

For 80 years, Institut Jules Bordet has been providing its patients with diagnostic and therapeutic strategies at the forefront of progress to prevent, detect and actively combat cancer. The Institute pursues three missions: care, research and teaching. Its international reputation attracts the world's leading cancer experts. Its spirit of innovation has enabled it to participate in the development and discovery of major new methods of diagnosis and treatment with the aim of bringing the findings to the patient as rapidly as possible.

In May 2018, the Jules Bordet Institute received official accreditation and designation from the OECl (Organisation of European Cancer Institutes) as a "Comprehensive Cancer Centre", a quality label reserved for multidisciplinary cancer care institutions whose activities include research and teaching. The only Comprehensive Cancer Center accredited by the OECl in Belgium.

Institut Jules Bordet is a member of the Iris and Université Libre de Bruxelles hospital networks. With its 160 beds dedicated exclusively to cancer patients, every year the Institute treats more than 6,000 in-patients., 15,000 out-patients and provides 84,000 consultations. To effectively meet future demographic and scientific developments, a new Bordet Institute is being built on the ULB Anderlecht campus, next to the Erasmus Hospital. Inauguration is scheduled for the end of 2021.

[www.bordet.be](http://www.bordet.be)

### **About Frontier Science (Scotland) Ltd**

Frontier Science (Scotland) Ltd (FSS) is a Scottish Charity involved in the design, conduct and analysis of clinical trials. Based in the Scottish Highlands, FSS has successfully partnered with BIG and IJB on the conduct and analysis of several large breast cancer trials over the last twenty years. FSS has data management, statistical and EDC capabilities and works with both industry and academic partners in a variety of disease areas. Its preferred model for working on clinical trials is one of collaboration and flexibility to meet any specific needs of a trial. It has strong educational objectives to ensure that the results of clinical trials with FSS involvement are published.

For more information, visit [www.frontierscience.co.uk](http://www.frontierscience.co.uk)

**For further information and/or interview requests, please contact:**

**BIG**

Oriana Spagnolo



Communications Manager

Tel: +32 479 814831

Email: [communications@bigagainstbc.org](mailto:communications@bigagainstbc.org)

#### **IJB**

Ariane Van de Werve

Head of Communication

Tel: +32 486 17 33 26

Email: [ariane.vandewerve@bordet.be](mailto:ariane.vandewerve@bordet.be)

#### **FSS**

Eleanor Mcfadden

Managing Director

Tel: +44 1540 651 000

Email: [eleanor.mcfadden@frontier-science.co.uk](mailto:eleanor.mcfadden@frontier-science.co.uk)

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