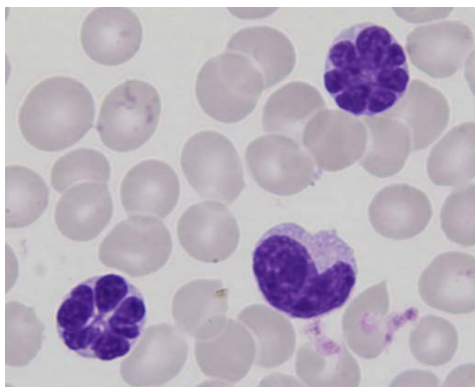


Press release

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## Novel tool to monitor therapeutic response of patients with viral leukemia



Typical "flower cells" in the blood of patients with viral leukemia

Brussels, 5 September 2017 – A few months after the discovery of a novel mechanism by which viruses cause leukemia (*Nature Communications*, 23<sup>rd</sup> May 2017), the research team led by Anne Van den Broeke (Institut Jules Bordet - University of Brussels and GIGA-University of Liège) publishes a new study that addresses a clinical question. In this pilot study, published 5 September in the journal *Leukemia*, the researchers apply an optimized molecular method to monitor disease progression in patients. They show that

**the new method enables a better evaluation of the therapeutic response for this particularly aggressive type of leukemia.**

### From basic research to translational studies

To address basic questions in cancer development, Anne Van den Broeke's team is studying a virus-induced leukemia caused by the Human T-cell leukemia virus-1 (HTLV-1) in combination with the corresponding animal model of blood cancer associated with infection by the closely-related Bovine Leukemia virus (BLV, a virus infecting cattle and sheep). In the fundamental study published in May 2017, the team developed several novel methods based on next generation sequencing (NGS) technologies which resulted in the discovery of a novel mechanism by which oncogenic viruses contribute to cancer development. In analyzing the data, they realized that one of the methods they had

been improving during this study (it maps the exact position of the virus within the genome (genetic material) of the host) could be of interest for monitoring patients under therapy. The team then put all their efforts in optimizing the method.

### **A method with clinical applications**

Patients with unfavorable viral leukemia subtypes have a poor prognosis. Clinical remission and response to treatment are currently defined on the basis of consensus criteria that have not been revised over the eight years since they were first described. Given the high rates of rapid relapse after achieving remission, there was an unmet need for improved molecular tools to better estimate response to treatment.

At diagnosis, each patient has a “viral ID card”, which corresponds to a precise location of the virus in the genome of their blood cells. The NGS method quantitatively detects this position. In patients under treatment, its decrease reflects a good therapeutic response while an increase reveals recurrence of the disease.

The pilot study published in *Leukemia* reports the follow-up of patients using the optimized approach developed by Van den Broeke’s team. The authors found that the method can reveal patients who are refractory to first-line therapy. In addition, it enables the detection of early relapse that escapes detection by conventional methods and outperforms any other molecular method examined thus far. Importantly, besides improving its sensitivity, the researchers dramatically reduced the cost of the technique, facilitating its implementation for clinical use.

The study, carried out in collaboration with scientists of the Necker University hospital in Paris, is a nice example of fundamental research that leads to a clinical application. Joint efforts of the HTLV-1 community of clinicians will now be needed to define optimal conditions for clinical utilization and standardized care to the benefit of the patient.

### **Reference of the study**

Maria Artesi, Ambroise Marçais, Keith Durkin, Nicolas Rosewick, Vincent Hahaut, Philippe Suarez, Amélie Trinquand, Ludovic Lhermitte, Véronique Avettand Fenoel, Michel Georges, Olivier Hermine & Anne Van den Broeke

Monitoring molecular response in Adult T-cell Leukemia/Lymphoma by high throughput sequencing analysis of HTLV-1 clonality, *Leukemia*, 2017, doi:10.1038/leu.2017.260

### **Senior investigators**

Dr Anne Van den Broeke (Institut Jules Bordet and GIGA) and Prof Michel Georges (GIGA).

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### **Research funding**

This work was supported by les Amis de l'Institut Bordet, the Fonds de la Recherche Scientifique (FRS), Télévie, the International Brachet Stiftung (IBS) and the Fondation Lambeau Marteaux.

### **International collaborations**

Hôpital universitaire Necker, Paris, France – Dr Olivier Hermine and Dr Ambroise Marçais

### **Enclosed**

Patients' follow-up illustration

Picture : Typical "flower cells" in the blood of patients with viral leukemia

### **For more information:**

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### **About the Jules Bordet Institute**

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

For more than 75 years, the Jules Bordet Institute 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

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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 2013, the Jules Bordet Institute received official accreditation and designation from the OECI (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. This is a first for Belgium.

The Jules Bordet Institute 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, 12,000 out-patients and provides 75,000 consultations. To effectively meet future demographic and scientific developments, the Institute is planning to build a new Institut Bordet on the ULB university campus in Anderlecht, next to the Erasmus Hospital. Inauguration is planned for 2018.

- Jules Bordet Institute website: [www.bordet.be](http://www.bordet.be)
- To consult the Jules Bordet Institute presentation brochure, go to: <http://www.bordet.be/fr/presentation/brochure/index.html>
- To view the Jules Bordet Institute presentation video, go to: <http://www.bordet.be/fr/presentation/organigr/textes/bordet.htm>

#### **About the GIGA Research Institute of the University of Liège**

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Established in 2007 at the University of Liège, the GIGA Research institute fosters interdisciplinary research in the biomedical sciences with an aim towards ground-breaking medical innovations. The institute is comprised of >500 members (PIs, senior scientists, postdocs, PhD students, technicians) with expertise in medical genomics, in silico medicine, neuroscience, cancer, infection-inflammation-immunity and cardiovascular sciences.

#### **About the ULB Cancer Research Center, U-CRC**

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The "ULB-Cancer Research Center" (U-CRC), headed by Prof. Francois Fuks, brings together researchers from the Faculty of Medicine of the ULB, the Erasmus Hospital and the Bordet Institute.

Focused on the patient, the fundamental and translational research is carried out in close contact with clinical research.

The U-CRC, which is a centre of reference both nationally and internationally for cancer research, is dedicated to increasing cooperation between teams, sharing technological platforms and promoting interdisciplinary research.

The U-CRC website: <http://ucrc.ulb.be>

#### **About the Friends of the Bordet Institute**

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The Friends of the Jules Bordet Institute is a non-profit-making organisation with the sole aim of supporting and financing research at the Jules Bordet Institute, a cancer centre that is a reference in Belgium and abroad. As the largest private donor to the Bordet Institute, "The Friends" have donated almost 12 million euros in the past five years.

Considerable progress has been made in the field of oncology in recent years. Our understanding of the biological origin of cancer is growing all the time. Whereas 10 years ago we spoke of the microscopic analysis of tumours, today we speak of genetic profile, of sequencing, etc. Dozens of new molecules and markers have been developed, permitting the advent of personalised treatment. This progress has to a large extent been made possible through the extraordinary technological progress of recent years. But these new techniques that now enable us to probe the infinitesimally small are increasingly expensive.

For more than 40 years, the help of the "Friends" has enabled the Jules Bordet Institute to pursue its research using the most advanced technologies, thereby providing patients with the most innovative screening and treatment techniques. Techniques that generate life and hope.

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By helping and supporting "The Friends of the Bordet Institute" you are participating in the many research programmes that they support and that all pursue a single aim: victory for life.

To find out more about the association The Friends of the Jules Bordet Institute, go to the website [www.amis-bordet.be](http://www.amis-bordet.be)

To find out more about the "101 tables pour la vie", go to the website [www.101tables.com](http://www.101tables.com)

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