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Virome characterization from Guthrie Cards in Children Who Later Developed Acute Lymphoblastic Leukemia

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The etiology of childhood acute lymphoblastic leukemia (ALL) is unclear in 95% of all cases. Some authors postulate that an in utero event that causes a cytogenetic aberration could be "the first step" that leads to the development of the leukemic clone. The aim of this study is to identify prevalent in utero DNA virus infections from children who later developed ALL as potential etiological agents of leukemogenesis. To do that, the virome of children who later developed ALL was characterized from dried blood spots (DBS) taken at birth and was compared to the virome of the control group by unbiased next-generation sequencing (NGS). Guthrie cards from 95 children diagnosed with ALL at 1-15 years of age at time of diagnosis and from 95 healthy controls, matched for age and birthplace, were analyzed. Whole blood was dissolved from the Guthrie cards and DNA was extracted using the MEM method. Two pools of extracted DNA from patient and control samples were prepared, randomly amplified and sequenced by illustra GenomiPhi and Illumina sequencing, generating approximately 7.4 million paired-end reads from each group. About 25% of the reads from each group were kept after quality filtering and 99.5% of remaining reads mapped to the human genome. No relevant viruses were found in the control group, whereas virome characterization of patients revealed the presence of human herpes virus type 6 (HHV-6) and parvovirus B19, which may play a role in leukemogenesis. However, the association between these viruses and the disease needs to be further investigated.

Biography

Britt Gustafsson works as a paediatrician at Karolinska University Hospital, specialized into stem cell transplantation in children. Since 2001 she has been a senior consultant into paediatric haematology, an associate professor since 2004 and a professor since 2013. She has been the main tutor for three PhD students, who graduated 2010, 2011 and 2014 and she has three more PhD students, where one of the students will work with backtracking leukemic clones back to the Guthrie cards.

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Biography

Christian Pou received his PhD in 2013 in Biochemistry, Molecular Biology and Biomedicine at the Institute for AIDS Research and at the University Autonoma of Barcelona. During his PhD, he was involved in the design, optimization and implementation of next sequencing strategies tailored to characterize the clinical value ultrasensitive HIV-1 genotyping to determine antiretroviral resistance and viral tropism. He is currently working as a postdoc developing next generation protocols for viral discovery, virome characterization and viral recombination at Department of Cell and Molecular Biology, Science for Life Laboratory and Karolinska University Hospital.

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