Introduction to RNA-Seq Pipelines and Computational Analysis

January 12, 2018 (14:00-18:00)
KU Leuven, Campus Gasthuisberg, room Pentalfa (ON1 04.543).

The Genomics Core Leuven organizes on January 12, 2018 a mini workshop around RNA sequencing (RNA-Seq) whose aim is to introduce investigators, young researchers and doctoral students the rudiments of RNA-Seq technology that would allow to perform own analysis on the Flemish Super Computer (VSC).

Part I: Introduction to RNA-Seq Technology and Pipelines

14:00 - 14:05 – **Welcome and Introduction.**

Speaker: Prof. Joris Vermeesch, Coordinator Genomics Core Leuven.

14:05 – 14:45 - **From Sample Preparation to Sequencing: Experimental Design, Library Preparation and cDNA Sequencing.**

Speaker: Céline Helsmoortel, PhD – NGS Expert, Genomics Core Leuven.

14:45 – 15:30 - **From Raw Read Data to Differential Gene Expression Analysis: The Road from Fastq files to Differentially Expressed Genes.**

Speaker: Álvaro Cortés Calabuig, PhD – NGS Bioinformatics Consultant, Genomics Core Leuven.

15:30 – 16:00 – Break.

Part II: RNA-Seq Computational Analysis

16:00 – 17:10 – **Introduction to Computing at the Flemish Super Computer.**

> *Part I: HPC Computing. Speaker: Alexander Vapirev, PhD - HPC Expert VSC.*

> *Part II: Analysis of RNA-Seq data at the VSC. Speaker: Álvaro Cortés Calabuig, PhD – NGS Bioinformatics Consultant, Genomics Core Leuven.*

17:10 – 17:55 – **Applications of RNA-Seq Data: The Development of a Placental Murine Xenograft Model and its Application to Examine Drug Effects.**

Speaker: Magali Verheecke, M.D. Research fellow within 'Cancer and Pregnancy', KU Leuven.

17:55 – 18:00 - **Final Words.**

For registration, please visit www.genomicscore.be. Places are limited and are assigned on a first-come first-serve policy. The workshop is free of charge for students and members of academic institutions in Belgium. The cost for members of non-academic institutions (VIB, IMEC, pharma, etc.) is 50€. For inquiries, please send an email to rnaseq@genomicscore.be.
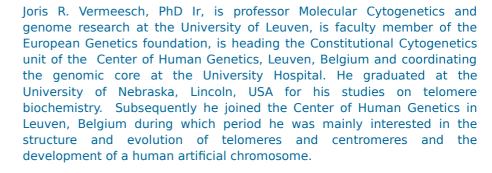
Speakers

Joris R. Vermeesch, PhD Ir, is professor Molecular Cytogenetics and genome research at the University of Leuven, is faculty member of the European Genetics foundation, is heading the Constitutional Cytogenetics unit of the Center of Human Genetics, Leuven, Belgium and coordinating the genomic core at the University Hospital. He graduated at the University of Nebraska, Lincoln, USA for his studies on telomere biochemistry. Subsequently he joined the Center of Human Genetics in Leuven, Belgium during which period he was mainly interested in the structure and evolution of telomeres and centromeres and the development of a human artificial chromosome.

Céline Helsmoortel obtained her degree on bio-engineer, option cell and gene biotechnology, in 2011 (bachelor Antwerpen, master Gent). During her doctoral training she used NGS technology to discover the causes of developmental disorders. Since July 2015 she is NGS expert at the Genomics Core Leuven.

Álvaro Cortés Calabuig obtained his PhD in engineering at the group of Declarative Languages and Artificial Intelligence of the KU Leuven in 2008. Subsequently he was postdoctoral researcher at the Universities of Antwerp and Vrije Universiteit Brussel. As member of the data science group of Johnson & Johnson he participated in European-founded Innovative Medicine Initiatives (IMI) Oncotrack and EMIF. Since December 2015 he is NGS bioinformatics consultant at the Genomics Core Leuven.

Alexander Vapirev provides HPC infrastructure and R&D optimization support for scientific programming at the Flemish Super-computing Centre (VSC), KU Leuven, Belgium. He facilitates the HPC needs for Bioinformatics and medical teams in relation to NGS Big Data policies. Formerly, he was heavily involved in multi-disciplinary R&D collaborations where his work focused on Big Data, HPC, and Machine Learning for industry standards in Life Sciences and Drug Design.

Magali Verheecke is in her final year of residency in gynecology/obstetrics, and since August 2013 a research fellow within 'Cancer and Pregnancy'. In February 2018 she will finish her PhD in which she has investigated the impact of chemotherapy during pregnancy on the fetal growth and the pediatric heart function. To investigate the impact on the fetal growth, the most important organ to examine is the placenta since it is the main source of nutrition towards the fetus. For this project a new murine 'placental' xenograft model has been developed, this in collaboration with Genomics Core.