

Sebastiaan Vanuytven

Curriculum Vitae

Research Interests

- Single-Cell (Multi-)Omics
- Oncobiology
- Gene Therapy
- Bayesian Statistics
- Nuclear Architecture
- HIV

Experience

- 2017–Present **PhD Student Computational Biology**,
Laboratory of Reproductive Genomics, KU Leuven, Belgium.
Studying for the first time the complete phenotype of a single cancer cell in its natural environment by combining single-cell multi-omics techniques and spatial transcriptomics
- 2017–Present **Visiting Scientist**,
Cancer Genomics Laboratory, Francis Crick Institute, United Kingdom.
- 2013–2014 **Research Rotations**,
KU Leuven, Belgium.
Internships in the research groups of Prof. Zeger Debyser, Prof. Stein Aerts and Prof. Johan Neyts

Education

- 2015–2017 **Master of Science Bioinformatics**, *KU Leuven*, *Magna cum laude*.
- 2013–2015 **Master of Science Biomedical Sciences**, *KU Leuven*, *Magna cum laude*.
- 2010–2013 **Bachelor of Science Biomedical Sciences**, *KU Leuven*, *Cum laude*.

Master thesis

Master of Science Bioinformatics

- Title *Single-cell sequencing to understand the biology of cellular heterogeneity in cancer*
- Supervisors Prof. Thierry Voet, Prof. Stein Aerts, Dr. Alejandro Sifrim, Dr. Daniel Brown
- Description Development of novel analysis methods and robust pipelines for single-cell multi-omics experiments and analysis of large-scale single-cell sequencing datasets of primary breast cancers

Master of Science Biomedical Sciences

Title	<i>Development of safer MLV-based gene therapy vectors: studying BET protein-chromatin occupation and generation of p12-fusions</i>
Supervisors	Prof. Zeger Debyser, Prof. Rik Gijsbers, Dr. Jonas Demeulemeester
Description	Analysis of BET protein ChIP-seq data and generation of p12-fusions to understand the genotoxicity of MLV-based gene therapy vectors

Grants

2018-2022	FWO Strategic basic research grant	<i>Personal Funding for PhD research</i>
2015	BBC2015 Student Fellowship	<i>Travel grant to attend BBC2015 conference</i>

Publications

Journal Articles

- [1] Anna-Marei Böhm*, Naomi Dirckx*, Robert J. Tower*, Nicolas Peredo, **Vanuytven, Sebastiaan**, Koen Theunis, Elena Nefyodova, Ruben Cardoen, Volkhard Lindner, Thierry Voet, Matthias Van Hul, and Christa Maes. Activation of skeletal stem and progenitor cells for bone regeneration is driven by pdgfrb signaling. *Developmental Cell*, 2019.

Conference Posters

- [1] **Vanuytven Sebastiaan**, Koen Theunis, Sarah Geurs, Peter Van Loo, Giuseppe Floris, and Thierry Voet. Single-Cell Multi-Omics Sequencing to Understand the Nature, Extent and Biology of Cellular Heterogeneity in Six Special Breast Cancer Cases. In *EACR Cancer Genomics 2019*, Cambridge, UK, June 2019.
- [2] **Vanuytven Sebastiaan**, Alejandro Sifirm, Mabel T Teng, Laura Mora Bitria, Daniel Brown, Elia Fernandez Gallardo, Koen Theunis, Sarah Geurs, Samira Majjaj, Hughes Duvilliers, Michail Ignatiadis, Francoisea Rothe, Christos Sotiriou, Peter Van Loo, Christine Desmedt, and Thierry Voet. Single-cell multi-omics sequencing to understand the nature, extent and biology of cellular heterogeneity in breast cancer. In *Single Cell Biology Confernece*, Wellcome Genome Campus, Hinxton, UK, Mar. 2018.
- [3] **Vanuytven Sebastiaan**, Alejandro Sifirm, Mabel T Teng, Laura Mora Bitria, Daniel Brown, Elia Fernandez Gallardo, Koen Theunis, Sarah Geurs, Samira Majjaj, Hughes Duvilliers, Michail Ignatiadis, Francoisea Rothe, Christos Sotiriou, Peter Van Loo, Christine Desmedt, and Thierry Voet. Single-cell multi-omics sequencing to understand the nature, extent and biology of cellular heterogeneity in breast cancer. In *Benelux Bioinformatics Conference*, Leuven, Belgium, Dec. 2017.
- [4] **Vanuytven Sebastiaan**, Jonas Demeulemeester, Zeger Debyser, and Gijsbers Rik. Studying BET protein-chromatin occupation to understand genotoxicity of MLV-based gene therapy vectors. In *Benelux Bioinformatics Conference*, Antwerp, Belgium, Dec. 2015.

Talks

- 05/2019 **EMBO Single-cell Biology**, *Tokyo*, Japan, Selected Speaker.
Single-Cell Multi-Omics Sequencing to Understand the Nature, Extent and Biology of Cellular Heterogeneity in Six Special Breast Cancer Cases
- 11/2018 **Genomics for diagnostics of Rare Diseases TRAINMALTA meeting**, *Leuven*, Belgium, Invited Speaker.
Single-cell multi-omics to detect genetic variants in cancer and development
- 06/2018 **European Human Genetics Conference 2018**, *Milan*, Italy, Selected speaker.
Single-cell multi-omics sequencing to understand the nature, extent and biology of cellular heterogeneity in breast cancer
- 05/2018 **Bioinformatics Student Symposium 2018**, *Antwerp*, Belgium, Selected speaker.
Single-cell multi-omics sequencing to understand the nature, extent and biology of cellular heterogeneity in breast cancer
- 02/2018 **Belgian Human Genetics Conference 2018**, *Ghent*, Belgium, Selected speaker.
Single-cell multi-omics sequencing to understand the nature, extent and biology of cellular heterogeneity in breast cancer
- 12/2015 **BBC2015 Student Conference**, *Antwerp*, Belgium, Selected speaker.
Studying BET protein-chromatin occupation to understand genotoxicity of MLV-based gene therapy vectors

Reviewing activities

- Journals Cell (junior reviewer)
- Conferences ESHG 2018/2019

Scientific leadership experiences

- Organiser RGS Belgium student symposium 2019

Languages

- Dutch Native language
- English Extensive Knowledge
- French Good knowledge
- German Basic knowledge
- Swedish Basic knowledge

Computer skills

- General Microsoft Word, Microsoft Excel, Microsoft PowerPoint, LaTeX
- Programming Python, Bash, Java, SQL, Git, Snakemake
- Statistics R, Bioconductor, Stan, Matlab
- Social Media Twitter, LinkedIn

Practical skills

- (q)PCR, Western blotting, immunochemistry, restriction digestion and ligation
- Cell culture work, cell transduction and bacterial transformation
- AlphaScreen assay, FACS, luciferase assay and viral vector production

Interests

- 2018-Present **Volunteer and KU Leuven representative.**
ISCB Regional Student Group Belgium
- 2018-Present **Scientific Blogger**, <https://svanuytven.github.io/>.
- 2010-Present **Passionate mountaineer and runner.**
- 2017-Present **Instructor.**
Teaching (single-cell) RNA-seq analysis to starting PhD students
- 2015-2017 **Student representative and member of the education committee Bioinformatics KU Leuven.**
Organiser buddy system first year students

References

Thierry Voet, Prof.

Laboratory of Reproductive Genomics, KU Leuven
Thierry.Voet@kuleuven.be, +32 16 33 08 41

Jonas Demeulemeester, PhD.

Cancer Genomics Laboratory, The Francis Crick Institute
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Alejandro Sifrim, PhD.

Laboratory of Reproductive Genomics, KU Leuven
Alejandro.Sifrim@kuleuven.be

Rik Gijsbers, Prof.

Laboratory for Molecular Virology & Gene Therapy KU; Leuven Viral Vector Core, KU Leuven
Rik.Gijsbers@med.kuleuven.be, +32 16 332 170