# Sebastiaan Vanuytven

*Curriculum Vitae*

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## Research Interests

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

## Experience

**2017–Present** **PhD Student Computational Biology**,
*Labratory 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 *Development of safer MLV-based gene therapy vectors: studying BET protein-chromatin occupation and generation of p12-fusions*

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

| | | |
|---|---|---|
| 2020 | EACR travel fellowship | *Travel grant to visit Crick Institute* |
| 2018-2022 | FWO Strategic basic research grant | *Personal Funding for PhD research* |
| 2015 | BBC2015 Student Fellowship | *Travel grant to attend BBC2015 conference* |

## 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

## Bioinformatics

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| Single-Cell | Seurat, Scater, SingleCellExperiment, Scanpy, SC3, SCENIC, MOFA+, Slingshot |
| Alignment | BWA, Kallisto, STAR, Bowtie2, Samtools, bedtools, RSEM, HTseq, Featurecounts, Cutadapt, GATK |
| Cancer | ASCAT, MuTect2, Delly, Varscan, Sequenza, SomaticSignature, FreeBayes |
| ATAC | MACS2, cisTopic, snapATAC |
| General | IGV, Picard, Multiqc, BEAST, PLINK |

## Interests

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

## References

**Thierry Voet, Prof.**
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**Jonas Demeulemeester, PhD.**
Cancer Genomics Laboratory, The Francis Crick Institute
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**Alejandro Sifrim, PhD.**
Laboratory of Reproductive Genomics, KU Leuven
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**Rik Gijsbers, Prof.**
Laboratory for Molecular Virology & Gene Therapy KU; Leuven Viral Vector Core, KU Leuven
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