



# ALEXANDRA GATZIOS

Pharmacist  
VUB (IVTD) – PhD student since February 2021

## PROFILE

26 years old

Pharmacist

Member of IVTD and IC-3Rs

## EDUCATION

### Vrije Universiteit Brussel

Pharmaceutical Sciences -  
Master of Science in Drug  
Development  
2020 *Magna cum laude*

## CONTACT

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## PROJECT OUTLINE

### Development and application of a human stem cell-derived, etiology-based *in vitro* anti-MASLD drug discovery platform targeting the thyroid hormone receptor axis

February 2021–2025

Non-alcoholic fatty liver disease has grown to pandemic proportions, affecting approximately 25% of the general population which makes it the number one chronic liver disease today. Within the next decade, NAFLD is also projected to become the leading cause for liver transplantation. Yet, no pharmaceutical therapies exist for the treatment of NAFLD.

Recently, the nomenclature for NAFLD was revised and the novel terminology of metabolic dysfunction-associated steatotic liver disease (MASLD) was adopted. This change was sparked by improved understanding of the pathogenesis, which is likely much more heterogenic than previously assumed, along with decades of clinical trial failures. The novel nomenclature envisions clinical trial redesign using stratified patient groups based on etiology, with the predominant disease drivers being metabolic-, genetic- or environmentally related, rather than inclusion based on histology score.

Anticipating clinical trial redesign, this research envisions to adopt patient heterogeneity in translational and preclinical research through development of a human-relevant, etiology-based anti-MASLD *in vitro* drug discovery platform that will include the three main pillars of patient heterogeneity (metabolic, genetic and environmental). The platform will target thyromimetic compounds, as this pathway was found to be dysregulated in MASLD patients and seems to be a promising approach to find new anti-MASLD therapies.

## RESEARCH OUTPUT

**Editorial** Boeckmans, J., Gatzios, A., Schattenberg J. M., Rodrigues, R., Rogiers, V. & Vanhaecke, T. *Archives of Toxicology* 2023, 97(6), 1825-1827.  
*Pharmacogenetics in early drug development for non-alcoholic steatohepatitis: missed chances and future opportunities.*  
DOI: [10.1007/s00204-023-03498-0](https://doi.org/10.1007/s00204-023-03498-0)

**Research article** Boeckmans, J.\*, Gatzios, A.\*, Schattenberg J. M., Koek, G. H., Rodrigues, R. & Vanhaecke, T. *Liver International* 2023, 43(5), 975-988.  
*PNPLA3 I148M and response to treatment for hepatic steatosis: A systematic review.*  
DOI: [10.1111/liv.15533](https://doi.org/10.1111/liv.15533)  
\*: shared first authors

**Research article** Boeckmans, J.\*, Gatzios, A.\*, Heymans, A., Rombaut, M., Rogiers, V., De Kock, J., Vanhaecke, T. & Rodrigues, R. *Cells* 2022, 11(5), [893].  
*Transcriptomics reveals discordant lipid metabolism effects between in vitro models exposed to elafibranor and liver samples of NAFLD patients after bariatric surgery.*  
DOI: [10.3390/cells11050893](https://doi.org/10.3390/cells11050893)  
\*: shared first authors

**Review article** Gatzios, A., Rombaut, M., Buyl, K., De Kock, J., Rodrigues, R., Rogiers, V., Vanhaecke, T. & Boeckmans, J. *Biomedicines* 2022, 10(1), [161].  
*From NAFLD to MAFLD: Aligning translational in vitro research to clinical insights.*  
DOI: [10.3390/biomedicines10010161](https://doi.org/10.3390/biomedicines10010161)

**Oral presentation** 3<sup>rd</sup> European Fatty Liver Conference, Maastricht (NL)  
Maastricht University, June 8<sup>th</sup>-10<sup>th</sup> 2022  
*Resmetirom reduces lipid load, restores THRB expression and prevents cell damage in a human stem cell based in vitro MAFLD model.*

**Poster presentation** EASL Congress 2023, Vienna (AT)  
Messe Wien Exhibition & Congress Center, June 21<sup>st</sup> - 24<sup>st</sup> 2023  
*Human skin stem cell-derived hepatic cells with genetic predisposition for liver fat accumulation mimic susceptibility to develop metabolic dysfunction associated fatty liver disease.*

**Poster presentation** IC-3Rs Symposium 2022, Brussels (BE)  
Vrije Universiteit Brussel, September 21<sup>st</sup> 2022  
*Resmetirom reduces lipid load, restores THRB expression and prevents cell damage in a human stem cell based in vitro MAFLD model.*

**Poster presentation** Global NASH Congress – online congress  
Global Engage, April 28<sup>th</sup>-29<sup>th</sup> 2021  
*Differentiation of multipotent human skin-derived precursors towards hepatic stellate cell-like cells for modelling liver fibrosis in vitro.*

## ACTIVITIES

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### TEACHING:

- **Teaching assistant:** Toxicologie en 3R-alternatieve methoden, 1st year MA Drug Development & MA Pharmaceutical Care (Vrije Universiteit Brussel, 2021-2022, 2022-2023)
- **Supervision of internship:** Master thesis of Shalina De Medts, 2<sup>nd</sup> MA Biology (Vrije Universiteit Brussel, 2022-2023)
- **Supervision of internship:** Short internship Maxim Van den Broucke, 2<sup>nd</sup> MA Drug Development (Vrije Universiteit Brussel, 2022-2023)

### WORKSHOPS & TRAINING:

- **Training:** Writing and publishing a research paper (LSM Doctoral School, Vrije Universiteit Brussel, November 2022)
- **Training:** Starter Seminars: The fundamentals of entrepreneurship and business management (VUB TechTransfer, Vrije Universiteit Brussel, October – December 2022)
- **Training:** Transcriptomic analysis in R (LSM Doctoral School, Vrije Universiteit Brussel, April – June 2022)
- **Training:** Research presentations and posters with impact. The basics: story and design (Vrije Universiteit Brussel, November 2021)
- **Training:** Attune NxT Basic Operation Training (Invitrogen, October 13<sup>th</sup> -14<sup>th</sup> 2021)
- **Online training course:** Safety assessment of cosmetics in the EU (VUB, February 1<sup>st</sup> – March 17<sup>th</sup> 2021)

### ORGANISATION OF EVENTS:

- **Congress (organizer):** Joint 3R Symposium 2023: Emerging fields in 3Rs. September 19<sup>th</sup>-21<sup>st</sup> 2023.
- **Congress (organizer):** IC-3Rs Symposium 2022: More science, more care, less animals. September 21<sup>st</sup> 2022, Brussels (BE)
- **Online congress (organizer):** IC-3Rs Symposium 2021: Human-relevant models for drug research and development (October 7<sup>th</sup>-8<sup>th</sup> 2021)

## GRANTS AND PRIZES

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- **EASL Young Investigator Bursary** for free participation at the EASL Congress 2023 and an additional year of free EASL membership
- **FWO-SB fellowship**: "Development and application of a human stem cell-derived, etiology-based *in vitro* anti-MAFLD drug discovery platform targeting the thyroid hormone receptor axis" (2022, 2 x 2 years)
- **Public prize for the best virtual presentation** at the IC-3Rs Symposium 2022 (Brussels, BE)
- **Travel grant to attend a conference** from LSM Doctoral School, Vrije Universiteit Brussel (Maastricht, NL)
- **Facultative subsidy from Brussels Environment** for the research project "In vitro model met menselijke huidstamcellen om geneesmiddelen te testen op gevorderde leververvetting" (2021, 1 year)

## PEER REVIEWING ACTIVITIES

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- *Stem Cells International* (IF<sub>2020</sub> 5.443)
- *International Journal of Medical Sciences* (IF<sub>2020</sub> 3.738)