

Translational research on exhaled volatile organic compounds from bedside to bench

Citation for published version (APA):

Fijten, R. R. R. (2017). *Translational research on exhaled volatile organic compounds from bedside to bench*. Maastricht University. <https://doi.org/10.26481/dis.20171211rf>

Document status and date:

Published: 01/01/2017

DOI:

[10.26481/dis.20171211rf](https://doi.org/10.26481/dis.20171211rf)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Stellingen

Behorende bij het proefschrift

Translational Research on Exhaled Volatile Organic Compounds From Bedside to Bench

Rianne R. R. Fijten

Maastricht, 11 december 2017

1. External study validation is paramount to assess the reliability of a predictive model in exhaled breath research, yet only 3% of studies performed thus far have included such validation. (this thesis)
2. When the use of exhaled breath is investigated to diagnose a disease with a heterogeneous rather than homogenous manifestation, a larger number of patients is required due to the variability of VOC concentrations detected in the exhaled breath. (this thesis)
3. A cell contains many layers of information of which VOCs represent only the upper layer. When information from the remaining layers is added, associations can be found between exhaled VOCs and underlying cellular processes. (this thesis)
4. The exposure of cells to a foreign compound induces metabolic responses leading to changed excretion of VOCs. (this thesis)
5. Exhaled breath collection carries no health risks, which makes it, in contrast to the current invasive golden standard diagnostic tools, very suitable for use in critically ill patients and other vulnerable patient populations. (this thesis)
6. Machine learning transforms incomprehensible data into knowledge, but if not properly used and validated this presumed knowledge may be incorrect.
7. Within the field of breathomics, standard operating procedures need to be developed to improve the standardization of breath collection and analysis.
8. The field of breath research is in nature a multidisciplinary field ranging from clinical research, analytical chemistry and sensor technologies to machine learning and therefore relates to the quote of Naomi Oreskes: "Science is not based on any individual, no matter how smart that individual may be. It is based on the collective wisdom of all of the scientists who have worked on a particular problem."
9. In the future, a handheld breath analysis device could be developed that would allow doctors to remotely monitor disease progression of patients.
10. Open science must become the norm, not the exception, as science belongs to all of society.
11. Even though the PhD student is the "captain of her ship", a PhD cannot be concluded successfully without a team effort.