

University of Groningen

Modular Approaches in PET-tracer Development

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DOI:
[10.33612/diss.133809999](https://doi.org/10.33612/diss.133809999)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2020

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Böhmer, V. (2020). *Modular Approaches in PET-tracer Development: Radiotracer Design, Synthesis and Automation for Prostate Cancer and Heart Failure*. University of Groningen.
<https://doi.org/10.33612/diss.133809999>

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Stellingen

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‘Modular Approaches in PET-tracer Development’

Radiotracer Design, Synthesis and Automation for Prostate Cancer and Heart Failure

door

Verena Ivonne Böhmer

1. The copper-catalyzed click reactions for the PET-synthesis of radiotracers lost its impact with the increasing field of bioorthogonal chemistry, which provides faster reaction times and higher biocompatibilities. (Chapter 1 and 3)
2. When writing a review in an interdisciplinary area, one will feel like Voltaire: “the more I read, the more I acquire, the more certain I am that I know nothing”. This is the point to either take a break or to create something new. (Chapter 2)
3. Clinical PSMA PET-imaging is undoubtedly one of the biggest achievements after the development of [¹⁸F]FDG and PSMA became a sophisticated target for new synthesis approaches of radiopharmaceuticals. However, the human body has other targets that might be as promising as PSMA. We as scientists should not miss this opportunity by using the PSMA-binding motif for new radiopharmaceuticals too often.
4. Protein binding of multivalent imaging agents dramatically increases and favors non-specific binding, not including this parameter in a multivalency-study does not allow a correct interpretation of the organ distribution. (*Pharmaceuticals* **2017**, 10, 29)
5. A bispecific theranostic agent targeting both PSMA and GRPR should be reconsidered when the *in vitro* data provide the information that the PSMA-targeting ligand causes the major tumor uptake with a prolonged retention time on cellular level and blocking both targets still results in relatively high uptake values. The risk for damaging healthy tissue exceeds the benefit of this theranostic agent. (*Pharmaceuticals* **2019**, 11, 358)
6. When animal studies are performed, the animals should not be seen as the data-points they will become, but as living beings which will be sacrificed for the human profit and should be treated with high respect.
7. Automation of radiosynthesis should not only be assessed by a reduced production time but more on the yield, reliability and quality of the obtained radiopharmaceutical, as this needs to fulfill the clinical standards. (Chapter 4)
8. Radiochemists are a rare species of chemists, who find their joy in working on small milligram scale reactions with maximal possible distances to short-living radionuclides, with restricted purification methods and a high risk of failure. (Chapter 3, 4 and 5)
9. Publishing a scientific article requires a smart and easy understandable presentation of the results, especially in interdisciplinary fields, by using figures, tables and graphs. Using more than 15 bar charts in one figure is not the best presentation choice. (*Biomaterials* **2018** 187, 117-129)
10. The COVID-19 pandemic revealed the real character of some people in terms of social competence and ability to process information provided by research institutes.
11. Short lab- and corridor conversations can be more productive and innovative than long-lasting meetings.