



UNIVERSITY
OF VIENNA



MEDICAL UNIVERSITY
OF VIENNA



Ludwig Boltzmann Institute
Applied Diagnostics

Radioactive Metals in Medicine (VO-270046)

Prof. Dr. Thomas L. Mindt

Dr. Jens Cardinale

Dr. Marie Brandt

University of Vienna 2019

Outline

Radioactive Metals in Medicine

Chapter 1: An Introduction Into Radiopharmaceutical Sciences and Nuclear Medicine

Chapter 2: Registered Metal-Based Radiopharmaceuticals

Chapter 3: Technetium-99m Radiopharmaceuticals and $^{186/188}\text{Re}$ Analogs

Chapter 4: Design and Development of Metal-Based Radiopharmaceuticals

Chapter 5: Fundamentals in Radiometal Labelling

Chapter 6: Production of Radionuclides (Focus on Generator Technologies and Nuclear Reactor Production Routes); Dr. Jens Cardinale

Chapter 7: Recent Developments and Future Trends; Dr. Marie Brandt

Chapter 8: Click Chemistry and Bioorthogonal Reactions (in Radiopharmacy/-chemistry)



Objectives

After the lecture you should know...

- ... the principles of nuclear imaging and endoradiotherapy
- ... the importance of technetium-99m in nuclear medicine and its applications
- ... the most common radiometals and their applications in diagnostic and therapeutic nuclear medicine
- ... important features of acyclic and cyclic chelating systems and radiometal complexes thereof (including radiolabeling, stability, reaction conditions etc.)
- ... important conjugation chemistry approaches (including click chemistry) for radiotracer development
- ... different production routes of radionuclides and their advantages/disadvantages
- ... examples of targeted radiopharmaceuticals



Administration

- 7 Double Lectures (some sessions are longer, others shorter...)

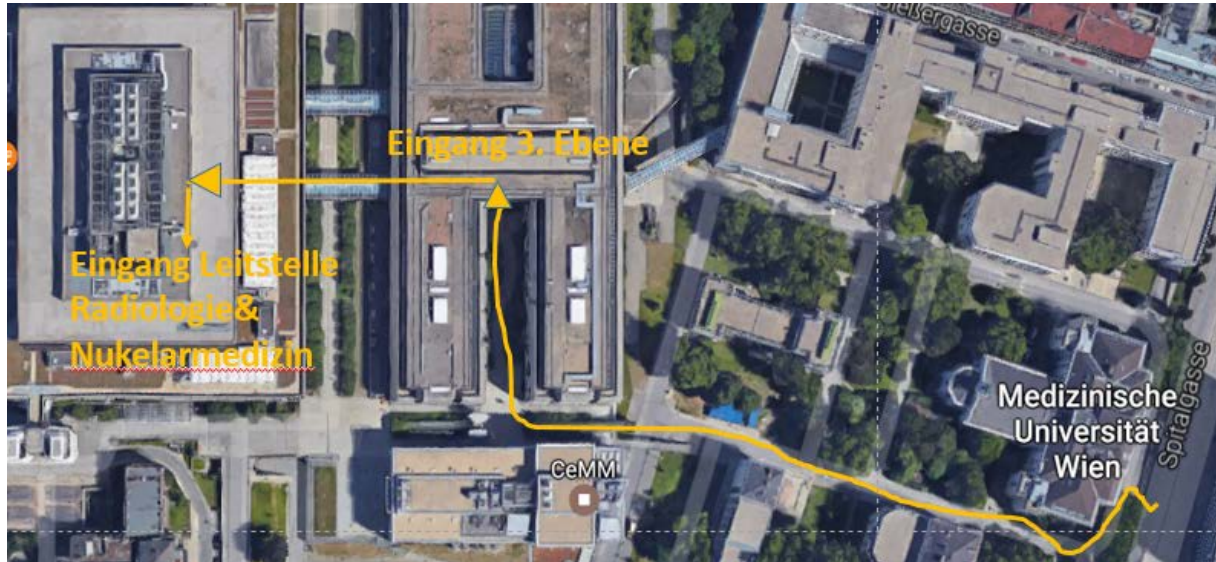
1) Thursday, 3.10.19, 4:15-5:45 pm Chapter 1 & 2	5) Thursday, 17.10.19, 4:15-5:45 pm Chapter 5
2) Tuesday, 8.10.19, 3:30-5:00 pm Chapter 3	6) Tuesday, 22.10.19, 3:30-5:30 pm Chapter 7 (M. Brandt)
3) Thursday, 10.10.19, 4:15-5:45 pm Chapter 4	7) Thursday, 24.10.19, 4:15-5:45 pm Chapter 8
4) Tuesday, 15.10.19, 3:30-5:30 pm Chapter 6 (J. Cardinale)	8) Exam : Tuesday, 17.12.19, 3:30-4:30 pm and Thursday 19.12.19, 4:15-5:15 pm

- Class size: 5-20 participants
- Language: English
- Course Material (Powerpoint presentation): Download Dropbox (please provide your e-mail address when registering for the class)
- E-Mail Contact: thomas.mindt@lbiad.lbg.ac.at
- Exam: written examination (multiple choice) ca. 30 min
- ECTS Points: 2



Administration

- Location: Library of the Nuclear Medicine at the AKH (Level 3, enter the «Leitstelle» and follow the signs to the «NUK Library» to your right)



- Evaluation Form: Will be handed out or is available from Prof. Mindt directly.



Tour Through the Hotlabs

- Ca. 1-hour tour through the hotlabs with Ph.D. students of LBIAD's group
Imaging Biomarkers
- **Date: 17.10.2019, Time: 3-4 pm**, meeting point: 2:55 pm in front of the NUK library
- Bring your labcoat and googles
- Radiation safety: 1) One person per group will get a dosimeter
2) Do not touch! (unless told so)
3) Measure for contamination before leaving the hotlabs
- Enjoy 😊 !



More Radiopharmaceutical Sciences

For those interested in the topic, it is highly recommended to sign up also for the following complementary classes:

Medizinische Radiochemie 1

Dr. V. Pichler, Dr. N. Berroteran-Infante

- Nicht-metallische Radionuklide und deren Anwendung; Zyklotron-basierte Radionuklide (VO 270173)

Medizinische Radiochemie 2

Dr. C. Vraka, Dr. T. Balber

- From Bench to Bed and Backwards (VO 270032)

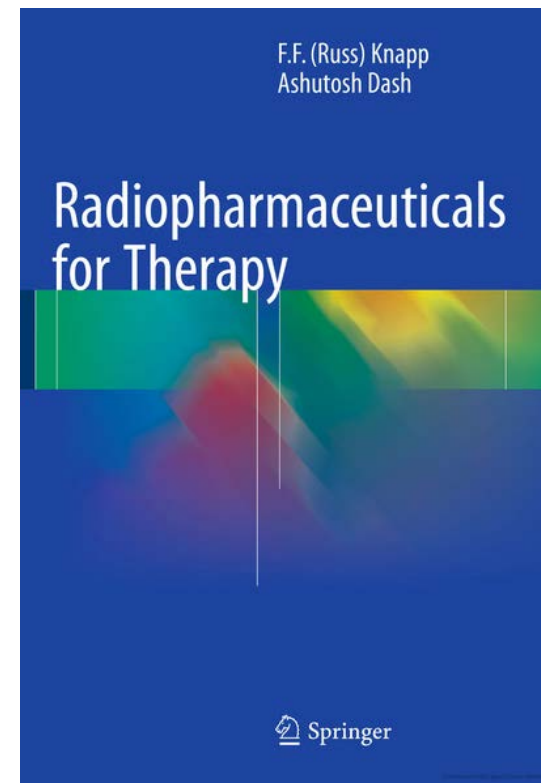
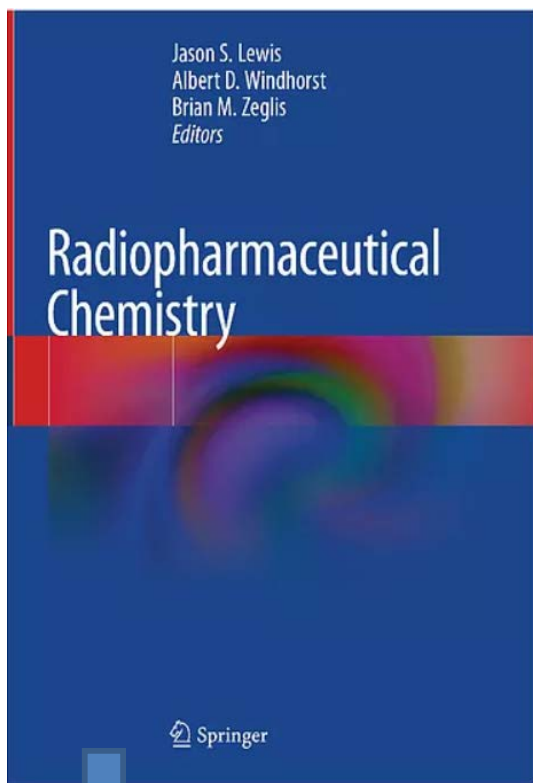
Radiopharmazeutische Technologie

Prof. Dr. Markus Mitterhauser

- Grundlagen, Herstellung und Anwendung von radioaktiven Arzneimitteln (VO 320043)



Recommended Text Books



Chapter: «Bioconjugation Methods» by Cardinale, Mindt et al.

Chapter: «Carbon-11 Tracers and Applications» by Pichler, Berroteran-Infante et al.

