LEARNING MODULE DESCRIPTION

GENERAL INFORMATION

1. Module title: **Radiolabeled compounds for diagnosis and cancer therapy**
2. Module code: **RCDCT**
3. Programme title: **Chemistry**
4. Cycle of studies: **2nd**
5. Year of studies (where relevant): **2**
6. Terms in which taught (summer/winter term): **winter**
7. Type of classes and the number of contact hours: **Lectures: 15 hrs, laboratory: 30 hrs**
8. Number of ECTS credits: **5**
9. Name, surname, academic degree/title of the module lecturer/other teaching staff/ e-mail:

   prof. K. Ogawa, Kanazawa, University Japan., **kogawa@p.kanazawa-u.ac.jp**

   dr. Monika Skrobańska, monskr@amu.edu.pl
   dr. Małgorzata T. Kaczmarek
10. Language of classes: **English**

DETAILED INFORMATION

Information about the lecture:
If non-invasively analyses (imaging) for biological functions from outside the body are capable, it is very useful in clinical. In the lecture, biological function analyses using molecular imaging, mainly nuclear medicine technology, and imaging based therapy will be explained.

1. Module aim (aims)

The main objectives of the lectures are to introduce radiolabeled compounds for imaging of various diseases and cancer therapy.

Students will be provided with the following knowledge:

- Kinds and characteristics of radiation emitted from radionuclides.
- [^{18}F]FDG for imaging of glucose metabolism, especially cancer imaging.
- Accumulation mechanism and meaning of images of cardiac function .imaging, brain perfusion imaging, and receptor imaging, etc.
- Usefulness of radionuclide therapy, such as radioimmunotherapy.
- Dosimetry

2. Pre-requisites in terms of knowledge, skills and social competences (where relevant)

Basic knowledge related to chemistry, anatomy, and physiology.

READING LIST

1. Michael J Welch, Handbook of Radiopharmaceuticals: Radiochemistry and Applications, John Wiley & Sons, 2003
2. Shankar Vallabhjosula, Molecular Imaging: Radiopharmaceuticals for PET and SPECT, Springer Science & Business Media, 2009

SYLLABUS:

Lecture

Week 1: Kinds and definition of radiation emitted from radionuclides.
Week 2: Usefulness and risk of radiation.
Week 3: [^{18}F]FDG-PET for imaging of glucose metabolism, especially cancer imaging.
Week 4: Usefulness of [^{18}F]FDG-PET imaging.
Week 5: Radiolabelled compounds for cardiac function imaging.
Week 6: Radiolabelled compounds for brain perfusion imaging.
Week 7: Radiolabelled compounds for receptor imaging and amyloid imaging.
Week 8: Radiolabelled compounds for other diseases.
Week 9: Radioimmunotherapy; radiolabeled antibody for cancer therapy.
Week 10: Bone imaging and palliation bone pain (bone metastases of cancer).
Week 11: Radionuclide therapy for thyroid cancer.
Week 12: Dosimetry; the determination of radiation dose for radiolabelled compounds.
Week 13: Compounds for decrease of absorbed dose after uptake of radionuclide.
Week 14: Radiolabelled compounds for apoptosis imaging.
Week 15: Radiolabelled compounds for imaging hypoxic region.

STUDENT WORKLOAD (ECTS credits)

Module title:	
Activity types	Mean number of hours* spent on each activity type
Contact hours with the teacher as specified in the programme	45
Preparation for laboratory project	20
Study of the results from laboratory	15
Reading of the indicated literature	10
Writing of the reports	15
Preparation for exam	20
Total hours	125
Total ECTS credits for the module	5

** Class hours – 1 hour means 45 minutes*

#Independent study – examples of activity types: (1) preparation for classes, (2) data analysis, (3) library-based work, (4)writing a class report, (5) exam preparation, etc.

GRADING SYSTEM:

5	EXCELLENT – outstanding performance	(91-100%)
4+	VERY GOOD – above the average standard with only minor errors	(81-90%)
4	GOOD – generally sound work with some minor errors	(71-80%)
3+	SATISFACTORY – fair but with a number of notable errors	(61-70%)
3	SUFFICIENT – fair but with significant shortcomings	(51-60%)
2	FAIL	below 51%