

## Undervisningsportfolio

**1. Undervisnings-CV: Oversigt over undervisnings- og vejledningsopgaver med angivelse af fagområder, omfang, undervisningsniveau (bachelor, kandidat, efter-/videreuddannelse, ph.d.). Type af undervisningsform angives, f.eks. forelæsning, holdundervisning, øvelse, vejledning, eksamination, censur, fjernundervisning, internetbaseret undervisning og evaluering af undervisning. Undervisningssprog angives.**

Lectures (Lectures given in 2020 and 2021 were online lectures)

1st semester Medis/Medicine Bachelor,

Module 1.1 Foundations of Medicine. Lecture title: "Mitosis and meiosis" (double lecture), 2020-2022 (Danish)

3rd semester Medis/Medicine Bachelor.

Lecture title: "Introduction to 3rd semester", 2018 (Danish).

Module 3.4 - Experimental Project: Muscle and Nerve function. Lecture title: "Introduction to the project", 2018 (Danish)

4th semester Medis/Medicine Bachelor

Lecture title: "Introduction to the semester", 2020-2021, 2023 (Danish)

Module 4.4 Experimental project: Control of cell growth.

Lecture title: "Introduction to the project module", 2020-2021, 2023 (Danish)

Lecture title: "Cell culturing" (double lecture), 2020-2021, 2023 (Danish)

5th semester Medis, Bachelor

Module 5.4 - Preclinical Evaluation and economic aspects of drug development. Lecture title: "In vitro blood-brain barrier models - A screening tool in drug development", 2016-2021 (Danish)

7th semester Medis, Master

Molecular Pathogenesis, Biomedicine

Lecture title: "Introduction to Molecular Pathogenesis and Journal Club" (double lecture), 2016-2022 (English)

Lecture title: "Atherosclerosis", 2015-2016 (English)

Lecture title: "Genetic Diseases" (double lecture), 2016-2023 (English)

Designing and Evaluating Pharmacological Research, Translational medicine.

Lecture title: "The blood-brain barrier in pharmacological research" (double lecture), 2020-2021 (English)

8th semester Medis, Master,

Molecular Therapy; Biomedicine and Translational Medicine

Lecture title: "Introduction to Molecular Therapy", 2017

Lecture title: "Peptide and Protein Therapeutics", 2017

Lecture title: "Targeted Therapy", 2017

Lecture title: "Viral and Non-viral Gene Therapy", 2017-2018, 2020

PBL, Case facilitation (Online case facilitation on 4th sem 2020)

Module 3.1 - The Nervous system I, 3rd semester Medis/Medicine, Bachelor, 2012-2013, 2015, 2017-2018

Module 3.2 - Clinical Psychology, 3rd semester Medis/Medicine, Bachelor, 2012, 2013, 2017, 2018

Module 4.1 - Reproduction, 4th semester Medis/Medicine, Bachelor, 2012-2013, 2020-2021, 2023

Module 4.2 (Medicine) – Pediatrics/Child growth, 4th semester Medis/Medicine, Bachelor, 2012-2013

Module 4.2 (Medis) - Advanced Biochemistry and Genetics, 4th semester Medis/Medicine, Bachelor, 2020-2021

Module 4.3 - Basic Pathology, 4th semester Medis/Medicine, Bachelor, 2012-2013, 2021, 2023

PBL, Project supervision (project supervision in 2020 were online)

4th-semester project groups, Medis/Medicine, Bachelor

Project title: "Neuroinflammation and the blood-brain barrier", 2021: 2 groups., 2023: 3 groups

Project title: "Recombinant Niemann-Pick Type C2 (NPC2) Protein – A Novel Strategy for Delivery of NPC2 to the Brain", 2020: 3 groups; 2018: 4 groups; 2017: 4 groups.

Project title: "Hypoxic regulation of transferrin receptor expression in the neurovascular unit". 2015: 4 groups.

Project title: "The blood-brain barrier and glioblastoma multiforme". 2013: 1 group; 2012: 3 groups, co-supervisor.

6th semester project groups, Medis/Medicine, Bachelor

Project title: "Investigation of brain tissue samples of NPC2-/- mice for evaluation of the optimal age to begin treatment and quantification of the effect of treatment of NPC2-/- fibroblasts". 2021: 1 group

Project title: "Niemann Picks disease type C: A review of current and potential treatments", 2020: 1 group

Project title: "Evaluation of the relative gene expression profile of HexA, PSAP, MCOLN1, and Lamp1 as quantitative biomarkers for evaluation of Protein replacement therapy in Niemann Picks Disease type C2", 2018: 1 group

Project title: "Developing a quantitative analysis of protein substitution therapy as a treatment for Niemann Picks Disease

type C2", 2018: 1 group

Project title: "Expression of genes encoding neurotransmitter receptors in cerebral pericytes", 2015: 1 group

Project title: "Expression of Glutamate Transporter in Rat Brain Endothelial Cells in an in vitro Blood-Brain Barrier Model", 2013: 1 group

7th semester project group, Medis, Master

Project title: "The role of Pericytes in the expression of tight junction proteins associated with brain capillary endothelial cells", 2020: 1 group.

Project title: "The function of ferroportin in neurons cultured as primary culture", 2013: 1 group, co-supervisor

Project title: "Establishment and characterization of an in vitro blood-brain barrier model based on porcine cells", 2012: 1 group, co-supervisor

8th semester project group, Medis, Master

Project title: "The role of pericytes in neuroinflammation", 2021: 1 group

Project title: "Protein Replacement Therapy for the Treatment of Niemann Picks Disease Type C2". 2018: 1 group

Project title: "Isolation of capillaries from frozen porcine brains". 2017: 1 group, co-supervisor

Project title: "Use of neuronal cells in primary culture as a tool for studies of neurodegeneration and therapeutic interventions", 2014: 1 group, co-supervisor

9-10th semester project group, Medis, Master (Master projects).

Project title: "The role of the pericyte in the normal and in the pathological brain", 2021-2022: 2 students

Project title: "Generation of CNS directed bivalent shark VNAR antibodies to an oncology target", 2020: 1 student, co-supervisor

Project title: "Viral Gene Therapy to Brain Capillary Endothelial Cells for Protein Secretion", 2018: 3 students

Project title: "An expression analysis of iron-related proteins in brain capillaries isolated from postmortem prefrontal cortex of aging human subjects", 2017-2018: 1 student, co-supervisor

Project title: "Viral Gene Therapy to Brain Capillary Endothelial Cells for Protein Secretion of Recombinant Niemann-Pick Type C2 (NPC2) Protein – A Novel Strategy for Delivery of NPC2 to the Brain", 2016-2017: 1 student

Project title: "Non-Viral Gene Therapy to Brain Capillary Endothelial Cells for Protein Secretion of Recombinant Niemann-Pick Type C2 (NPC2) Protein – A Novel Strategy for Delivery of NPC2 to the Brain", 2016-2017: 1 student

Project title: "The antioxidant defense against neurodegeneration in primary neuronal cultures", 2014: 2 students, co-supervisor

Ph.D. Supervision: 2018-2023

- Co-supervisor for 3 Ph.D. students.

Examination

Molecular Pathogenesis, 1st semester Medis Master, Biomedicine, 2015-2021

Internal sensor for project groups on module 3.4: Experimental Project: Muscle and Nerve function, Medis/Medicine, Bachelor, 2017, 2020, 2023

Nervoussystem I, 3rd semester, 2017

Molecular therapy, 2nd semester Medis, Master, Biomedicine, 2017

My project groups, 4th semester and 6th semester, Bachelor, 2012-2023

My project groups, 1st semester to 4th semester Medis, Master, 2012-2021

Other teaching activities

Teaching Assistant

1st semester histology course, Medis/Medicine, Bachelor, 2012

2nd semester resource sessions, Medis/Medicine, Bachelor, 2012

Supervisor on graduate projects for the biomedicine laboratory technicians

Project title: "Establishment of a primary astrocyte-cell culture in serum-free medium", 2017: 1 student

Project title: "Ferroxidase activity in primary pericytes, astrocytes, and brain capillary endothelial cells", 2015: 1 student

Project title: "In vivo purification of brain capillaries", 2014: 1 student

Project title: "Establishment and characterization of an in vitro blood-brain barrier model based on porcine cells", 2012: 1 student

**2. Administration og ledelse af uddannelse: Erfaring med uddannelsesledelse og –koordinering. Oversigt over studieadministrative opgaver, eksempelvis medlem af studienævn, studieleder, semesterkoordinator, fagkoordinator, akkreditering m.v. Erfaringer med planlægning af uddannelsesafvikling. Erfaring med udvikling af uddannelser. Deltagelse i udvalg, kommissioner m.m. vedr. uddannelse.**

Semester coordination:

• 3rd semester Medis/Medicine Bachelor, 2017

• 4th semester Medis/Medicine Bachelor, 2020-2021, 2023

I have been a semester coordinator for two different semesters. I was a substitute on 3rd semester for a year, but afterward I was involved in the restructuring of the module 3.1 – The Nervous system I. I have now for the third year been appointed semester coordinator on the 4th semester Medis/Medicine, which has been some turbulent semesters, as the first corona lockdown started in the middle of marts 2020, in my first year as semester coordinator, and the second lockdown was ongoing at the beginning of the semester 2021 and lasted until the middle of April. All three modules were therefore converted to online teaching. My coordination has, therefore, been highly influenced by the Covid-19 virus, but I think that we have coordinated the semester in the best possible way under the circumstances, without having to cancel any of the normal teaching activities.

Module coordination:

Module 3.1 - The Nervous system I, Medis/Medicine, Bachelor, 2017

Module 3.4 - Experimental Project: Muscle and Nerve function, Medis/Medicine, Bachelor, 2017

Module 4.4 - Experimental project: Control of cell growth, 2020-2021, 2023

Molecular Pathogenesis, 1st semester Medis, Master, Biomedicine, 2015-2018, 2020-2021

Molecular therapy, 2nd semester Medis, Master, Biomedicine, 2017

I have been coordinating different modules at both the bachelor and master levels. As a semester coordinator, I am automatically coordinating the project modules. The 4th semester has in 2020-2021 been highly influenced by the Covid-19 lockdowns. Module 4.4 Eksperimentel Project: Control of cell growth was in the spring of 2020 converted to a theoretical project despite learning outcomes, like 1) culturing cells under sterile condition, 2) evaluate cell growth and cell morphology-based on microscopy, and 3) use molecular biologic methods to evaluate a specific problem. This has resulted in bachelor students that have practically never been to the laboratory, and therefore are lacking important skills before the beginning of their bachelor projects. To avoid the same problem in 2021, I decided to change the entire setup for running these 4th-semester projects, so we could welcome all students in the lab, under the current corona restriction. It was not an easy task to fit 240 students into three labs, and all in 4,5 weeks, and ensure all learning outcomes were fulfilled. Normally all labs would be filled with too many students at once (+40, which under corona restricting only allows around 15 students), which is not a stimulating learning environment. Therefore, together with a few colleagues, we brainstormed on a general study setup that could ensure all groups learned the same methods and skills, but still allowed room for project-specific details and PBL elements. Afterward, I made a detailed plan, and we are currently in the final phase of the laboratory part of the 4th-semester projects. So far I have only received positive feedback from both laboratory technicians, supervisors involved, and students. The best thing about this new setup is that we have combined all the skills of the supervisors and provided only the best to all groups. Some supervisors are giving lectures or workshops on methods to all students, other supervisors are learning groups to culture cells, isolate RNA, perform immunocytochemical stainings or run RT-qPCR, while yet others are behind the scene performing microscopic tasks. All supervisors have pitched in with their specific expertise, and we are helping each other now. Since all groups are performing the same setup in the lab, but with different project-specific details, the laboratory technicians can supervise all groups equally independently on the research topic, which has given them a lot of flexibility and improved their productivity. Furthermore, we are now able to include more methods into each project within the economic budget provided by the department, which was not the case before. I planning on improving the model even further for the coming years, and keep the number of students in the lab at the same time to a minimum, as Corona has taught us that the students learn more when we provide a more quiet learning environment. I hope that this change in the project structure will be evident and highly beneficial for especially Medis students when they reach the higher semester.

I have also been coordinating the 7th semester Medis Master module Molecular Pathogenesis for some years now. When I took over the module in 2016, it had been a problematic module with a low attendance rate and unmotivated students. I revised the course and included more student activity, and made the module focus more on research literature than textbook literature. As an extra element, I also included a journal club, with the focus on learning the art of reading scientific literature and being critical about what you are presented to. Since 2017, I have only received positive evaluations of the course and complimentary comments from the students.

### **3. Formel pædagogisk uddannelse: Oversigt over gennemførte universitetspædagogiske kursusforløb, PBL-kurser, workshops, udviklingsprojekter, kollegial supervision o.l. Udtalelse fra universitetspædagogikum. Deltagelse i konferencer om pædagogik og didaktik. Dokumentation i form af kursusbeviser, udtalelser m.m. vedlægges.**

Assistant professor course (Adjunkt pædagogikum) (2018), including course modules on Teaching at a PBL university

Planning and implementation of group instructions

The use of IT and Media for learning and teaching

The PBL group – collaboration, process, and supervision

Planning and implementation of group instructions

Workshop for case facilitators (2019)

Basic Course in Pedagogy for University Teachers, PBL model, Aalborg University (2013)

### **4. Andre kvalifikationer: Bidrag til konferencer, debatindlæg, videnskabelige artikler om pædagogiske emner m.v. Kollegasupervision, redaktørarbejde, erfaring som mentor og**

## **anden kompetenceudvikling.**

MS TEAMS as a platform for online teaching

MS TEAMS as a platform for exams

Moodle as a tool to make an online multiple-choice quiz as a tool for course examination

ZOOM for teaching

University Teaching days

## **5. Pædagogisk udvikling og forskning: Udvikling af nye kurser, undervisningsmateriale, undervisnings- og eksamensformer eller andet udviklingsarbejde. Didaktisk og pædagogisk forskning. Samarbejde med eksterne samarbejdspartnere.**

I continue to develop my teaching modules and lectures for each semester. This includes updating teaching material, lecture slides, and my teaching notes for case facilitation. I see this as an important part of my teaching obligations because I believe it improves the students learning outcome, but also makes me a better teacher for every year I am involved in the same teaching activity. I have, as already mentioned, been involved in the successful development of several modules.

## **6. Udtalelser om undervisningskompetencer fra foresatte og kolleger. Undervisningsevalueringer og eventuelle udmærkelser for undervisningsvaretagelse.**

I generally receive a positive teaching evaluation on the modules that I coordinate, from my case groups, and especially my project groups. The 7th semester Medis Master module "Molecular Pathogenesis", has only received positive feedback for the last four years. As my second year, as a semester coordinator on 4th semester Medis and Medicine, I hope that I have helped the module coordinators, and especially the project module, convert some of the negative feedback to positive comments. Since the semester is still ongoing this is still unknown, but the students seem positive so far, based on the semester evaluation meetings. At the end of a module or a project period, I always ask the students to evaluate the teaching activity and I use this evaluation to improve my teaching for next semester.

## **7. Evt. personlige refleksioner og initiativer: Personlige overvejelser knyttet til undervisning og vejledning, ønsker til og planer for pædagogisk videreudvikling, planer for opfølgning på undervisningsevalueringer m.v. Refleksioner over eget pædagogiske arbejde, dets målsætninger, metoder og gennemførelse. I refleksionen analyseres og motiveres dine pædagogiske aktiviteter i forhold til din pædagogiske forståelse og de studerendes læring. Tanker om undervisningsformen på Aalborg Universitet, der har et stort indhold af gruppeorganiseret projektarbejde og problembaseret læring (PBL).**

I believe the PBL teaching method practiced at Aalborg University is a more motivating teaching form than the traditional one used at other universities. The use of learning outcomes instead of a reading list puts more responsibility in the hands of the students, which helps students to take responsibility for their own learning. Some students are curious by nature and do, therefore, not settle with the knowledge they get from one book (deep learners) but seek additional literature. I think this curiosity is very important for their learning. My teaching philosophy is, therefore, to stimulate students, especially students not curious by nature, not to settle with the information they already have (surface learners), but challenge them to ask additional questions that require them to seek more knowledge (deep learners). This might result in frustrated students but to my experience, some degree of frustration motivates students to work harder. The PBL teaching method for Medis/Medicine highly supports this way of learning. In PBL case modules the students are offered case and resource sessions in addition to the traditional lectures, which is a more passive learning form. In these settings, the students get the opportunity to work with and discuss the learning outcomes with others under the supervision and guidance of a facilitator. In this forum, they can stimulate each other's curiosity, and thereby understand the entire picture instead of settling with a superficially answer to the learning outcomes. I believe that the most important function of a case facilitator is to stimulate this deeper discussion. Learning new stuff is easier when the students understand it instead of learning by rote. However, the facilitator should be careful not to answer, but instead, supply the students with these additional questions needed to stimulate the superficial learners to seek a deeper learning approach. The project module likewise encourages students to be curious and not to settle with already acquired knowledge. However, this is very much up to the supervisor and the project description. In the education of Medis/Medicine bachelor and Medis master, it is difficult to propose projects entirely formed by the students due to the economy and timeframe of the project period. Instead, the projects often include a hypothesis and a set of methods needed for the students to answer the hypothesis, making it a so-called task project. However, I believe it is possible and important to move the task project in the direction of a discipline project and leave some of the project decisions open. This makes the students motivated to take responsibility for the project outcome and stimulates them to seek more information to make these decisions. This process can furthermore result in some beneficial frustration and curiosity that make them work harder. However, the more decisions that are put into the hands of the students the more guidance they often need, which is important to remember as a supervisor. I try as a supervisor to be present during the project period, especially in the first phase of the project, so I can guide students in the right direction. However, some degree of frustration is needed for them to work hard

to understand the project hypothesis and the methods. This does demand both patience and guidance from me as a supervisor, instead of just giving them the answer. Instead, I try to guide them to find the answer themselves. Some students might not handle frustrations in the same beneficial way, so it is important to find the perfect balance. If they become too frustrated they might simply give up.

I plan to continue developing my skills as both a lecturer, casefacilitator, and as a project supervisor, by participating in teaching courses, but also by observing some of my colleagues teaching. I especially enjoy supervising project groups since, it allows me to work closely with a small group of students, making it easier to know and challenge each student. It furthermore enables me to combine my teaching obligations and research interest.

## **8. Andet.**

Skriv dit svar her...