TRI

PhD Course in Translational Research I

"From bedside to bench – and back again"

Translational research combines research methods from basic science and clinical science in order to describe novel disease mechanisms, and to understand their significance in clinically relevant real-life patient populations.

This course describes commonly used techniques in translational research, from study design, to specific clinical and laboratory methods. This will be combined with discussions of both clinical and basic science aspects of the participants' own ph.d. projects.

Are you a clinical researcher working on a project which involves laboratory analyses, e.g. markers of inflammation, or are you a laboratory scientist working on a project which aims to have clinical relevance? The course is relevant for both clinical researchers and basic scientists, working on research projects with translational aspects. The course provides a broader understanding of the field of translational research, and aims to strengthen the participants' ability to design and conduct clinically relevant projects, using techniques from both clinical and basic science methods, to produce results of high scientific quality.

After the course, the participant will:

- Be able to design a study that integrates basic and clinical research
- Be able to re-think translational aspects into their own research projects
- Be introduced to a number of key clinical and laboratory tools in translational research
- Be introduced to system biology and 'omics' approaches in clinical research
- Get feedback on their own projects from fellow phd-students and senior researchers

(2 days) Course leaders: Celeste Porsbjerg and Asger Sverrild

Preparation: Prepare 3-5 power point slides on your study: Hypothesis, design, and specific challenges that you would like to discuss during the course. *(Estimated preparation time incl literature study: 6 hours pr student)*

Dates: 10-11 November 2016

Wikipedia: **Translational research** (also referred to as translational science) is defined by the European Society for Translational Medicine (EUSTM) as *an interdisciplinary branch of the biomedical field supported by three main pillars: benchside, bedside and community.* The goal of TM is to combine disciplines, resources, expertise, and techniques within these pillars to promote enhancements in prevention, diagnosis, and therapies. Accordingly, TM is a highly interdisciplinary field, the primary goal of which is to coalesce assets of various natures within the individual pillars in order to improve the global healthcare system significantly.

DAY 1:

8.30-9.00	CP	Introduction to the day	
9.00-9.30	CP	**Introduction to Translational Research.**	The principles of translational research – advantages and application.
9.30-10.15	AS	**Bedside study designs**	- Identifying the relevant research question clinically (eg real life studies). - Clinical studies (observational, interventional, phase I-IV)
10.15-10.30		Break	
10.30-11.15	Martin	**Laboratory methods I**	Eksempel til anvendelse af metode • Oprensning af T celler fra blod • In vitro aktivering med beads WB • Princippet bag og gennemgang af protokol • Eksempler på WB og hvordan man analyserer et blot • BioRad maskine til at digitalisere fremkaldelsen ➢ Intensitets-måling med ImageJ ➢ Normalisering til antal celler ➢ Normalisering til housekeeping gene ➢ Normalisering til total protein mass Oprensning af cytosol og kerne (eksempel med vitamin D receptor der translokerer til nukleus ved tilsætning af vitamin D) • generelt gennemgå hvad der er godt ved WB og hvor der er pitfalls ELISA • Princippet bag of gennemgang af protokol • Standard-kurve og udregning af ukendte prøver Eksempler på cytokin-målinger fra et T celle aktiverings-forsøg • MSD introduktion
11.15-12.15	CP +AS+CM	***My project (3 participants)***	*- each participant will present a short outline of their project (hypothesis, aims, design) for group discussions*
12.15-12.45		LUNCH	
12.45-13.30	CP	**Clinical research methods** – How to obtain clinically relevant outcomes	- questionaires, - semi-quantitative measures, - objective measures - MCID
13.30-13.45		***Break***	
13.45-14.15	Biopeople /Elias	**How to develop a good biomarker**	- What defines a good biomarker? - What are the key steps in validating a biomarker?
14.15-15.00	CP +AS	***My project (3 participants)***	*- each participant will present a short outline of their project (hypothesis, aims,*

			design) for group discussions

DAY 2

8.30-9.15	**Peter Davidsen**	**´Omics´ - a new way to understand disease mechanisms**	- Proteomics & genomics in medical science: What is it and how can it provide new insights?
9.15-10.00	**AS + CP+ CM**	***My project (3 participants)***	*- each participant will present a short outline of their project (hypothesis, aims, design) for group discussions*
10.00-10.15		***Break***	
10.15-10.45	**AS**	**Sampling methods – how to build a good biobank**	- Do´s and don'ts in sampling and storing biomaterial
10.45-11.15	**CM**	**Benchside study designs:**	- Identifying the relevant research question in basic science – - Disease models (animal models, in vitro cell culture models)
11.15-12.00	**AS + CP+ CM**	***My project (3 participants)***	*- each participant will present a short outline of their project (hypothesis, aims, design) for group discussions*
12.00-12.30		***Lunch***	
12.30-13.00	**Terkild**	**Laboratory methods II**	- FACS
13.00-13.30	**Terkild**	**Laboratory methods III**	- RNA analyser (qPCR, Microarray og RNA-seq)
13.30-13.45		***Break***	
13.45-14.15	**NN**	**Bioinformatics**	- Needles in the haystack – How to approach big data
14.15-14.45	**CP**	**Translational research – Back to bedside**	How to validate and implement findings in the clinical setting (TR5 research)
14.45-15.00	**CP**	**Closing remarks and evaluation**	