



**Methods in**

**Cardiac Research**

**Tuesday 11th to Thursday 13th April 2023**

At Oslo University Hospital Ullevål

Course administration:

Andreas Romaine (Main organizer)

Anna Bergan-Dahl

Mathis Korseberg Stokke

**TUESDAY APRIL 11TH (Meeting Room, IEMF, building 7, 4th floor)**

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| 09.00-09.20 | Introductory remarks & overview of methods covered by the course  Andreas Romaine, Anna Bergan Dahl |
| 09.20-09.40 | L01: Cardiac translational research – from bench to bedside  Mathis Stokke |
| 09.40-09.45 | Buzz |
|  | **PART I: METHODS IN MOLECULAR BIOLOGY** |
| 09.45-10.00 | L02: Cell cultures in cardiac research  Pugazendhi Murugan Erusappan |
| 10.00-10.05 | Buzz |
| 10.05-10.20 | Coffee break |
| 10.20-10.40 | L03: Gene expression in the heart: Quantitative PCR and RNA sequencing  Athiramol Sasi |
| 10.40-10.45 | Buzz |
| 10.45-11.15 | Student presentations (5) |
| 11.15-11.30 | L04: Proteins: Separation, purification and quantification  Marianne Lunde |
| 11.30-11.35 | Buzz |
| 11.35-12.15 | Student presentations (6) |
| 12.15-13.00 | Lunch |
| 13.00-13.15 | L05: Protein-protein interactions  Thea Parsberg Støle |
| 13.15-13.20 | Buzz |
| 13.20-13.35 | L06: Protein localization: Flow cytometry & ELISA  Andreas Romaine |
| 13.35-13.40 | Buzz |
| 13.40-14.00 | Coffee break |
| 14.00-14.15 | L07: Detection of cyclic nucleotides and protein-protein interactions: FRET in cardiac research  Kjetil Wessel Andressen |
| 14.15-14.20 | Buzz |
| 14.20-15.00 | Methods sum-up and article workshop |
| 15.00-16.00 | Practical Demonstration 1: Methods in Molecular Biology  @Institute for Experimental Medical Research, bldg. 7, 4th floor |

**WEDNESDAY APRIL 12TH (Meeting Room, IEMF, building 7, 4th floor)**

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|  | **PART II: CARDIAC FUNCTION AND PHENOTYPING IN SMALL ANIMALS** |
| 08.00-08.15 | L08: Exercise training and testing of small animals  Mani Sadredini |
| 08.15-08.20 | Buzz |
| 08.20-08.35 | L09: The isolated perfused heart: Langendorff preparation  Kåre-Olav Stensløkken |
| 08.35-08.40 | Buzz |
| 08.40-08.55 | L10: Genetically modified mice in heart failure research  Ida Gjervold Lunde |
| 08.55-09.00 | Buzz |
| 09.00-09.15 | Coffee break |
| 09.15-09.45 | L11: Surgical methods and echocardiography in small animal models  Einar Sjaastad Nordén |
| 09.45-09.50 | Buzz |
| 09.50-10.10 | Student presentations (3) |
| 10.10-10.25 | L12: MRI in small animals  Emil Knut Stenersen Espe |
| 10.25-10.30 | Buzz |
| 10.30-10.45 | Coffee break |
| 10.45-12.00 | Practical Demonstration 2: Assessment of Cardiac Function in Small Animals @Komparativ medisin, bldg. 25, basement |
| 12.00-13.00 | Lunch |
|  | **PART III: METHODS IN CARDIAC CELLULAR BIOLOGY** |
| 13.00-13.40 | L13: Imaging techniques for assessment of cardiomyocyte structure and function  Michael Frisk |
| 13:40-13.45 | Buzz |
| 13.45-14.00 | L14: Investigating effects of mechanical stretch on isolated cardiomyocytes  Jia Li |
| 14.00-14.05 | Buzz |
| 14.05.14.15 | Student presentations (2) |
| 14.15-14.30 | Coffee break |
| 14.30-15.00 | Methods sum-up and article workshop |
| 15.00-16.00 | Practical Demonstration 3: Methods in Cardiac Cellular Biology  @Institute for Experimental Medical Research, bldg. 7, 4th floor |
| 16.00–17.00 | **Pizza** |

**THURSDAY APRIL 13TH (Meeting Room, IEMF, building 7, 4th floor)**

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|  | **PART IV: CLINICAL RESEARCH AND LARGE ANIMAL MODELS** |
| 09.00-09.45 | L15: MRI and CT, SPECT and PET in evaluation of cardiac function  Einar Hopp, Anne Günther, Anders Hodt |
| 09.45-09.50 | Buzz |
| 09.50-10.10 | Coffee break |
| 10.10-10.40 | L16: Large animals in cardiovascular research  Mathis Korseberg Stokke |
| 10.40-10.55 | L17: Electrocardiograms in cardiac research  Mathis Korseberg Stokke |
| 10.55-11.00 | Buzz |
| 11.00-11.15 | Coffee break |
| 11.15-12.00 | Student presentations |
| 12.00-13.00 | Lunch |
| 13.00-13.15 | L18: Innovation starts with scientific discoveries  Maria Vistnes |
| 13.15-13.20 | Buzz |
| 13.20-13.40 | L19: Cardiac translational research – from bedside to bench  Kristine Mørk Kindberg |
| 13.40-13.45 | Buzz |
| 13:45-14.15 | Student presentations/Sum-up of the course |
| 14.15-14.30 | Coffee break |
| 14.30-15.30 | COURSE TEST |
| 15.30 | Course end |

**Tuesday April 11th 15.00-16.00**

**Practical Demonstration 1:** **Methods in Molecular Biology**

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|  | **Location** | **Demonstrators** | **15.05-15.20** | **15.25-15.40** | **15.45-16.00** |
| Cell work | Inst. Exp. Med. Res. Bldg. 7, 4th floor | Pugazendhi Murugan Erusappan | **Group A** | **Group B** | **Group C** |
| PCR | Inst. Exp. Med. Res. Bldg. 7, 4th floor | Hege Ugland | **Group B** | **Group C** | **Group A** |
| Western | Inst. Exp. Med. Res. Bldg. 7, 4th floor | Marianne Lunde | **Group C** | **Group A** | **Group C** |

**Wednesday April 12th 10.45-12.00**

**Practical Demonstration 2: Assessment of Cardiac Function in Small Animals**

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|  | **Location** | **Demonstrators** | **11.00-11.15** | **11.20-11.35** | **11.40-11.55** |
| Mouse surgery | Komparativ Medisin Bldg. 25, basement | Arne Olav Melleby | **Group A** | **Group B** | **Group C** |
| Echocardiography on rodents | Komparativ Medisin Bldg. 25, basement | Ivar Sjaastad | **Group B** | **Group C** | **Group A** |
| MRI on rodents | Komparativ Medisin Bldg. 25, basement | Lili Zhang | **Group C** | **Group A** | **Group B** |

**Wednesday April 12st 15.00-16.00**

**Practical Demonstration 3: Methods in Cardiac Cellular Biology**

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|  | **Location** | **Demonstrators** | **15.05-15.20** | **15.25-15.40** | **15.45-16.00** |
| Microscopy | Inst. Exp. Med. Res. Bldg. 7, 4th floor | Michael Frisk, Jia Li, Andreas Romaine | **Group A** | **Group C** | **Group B** |
| **Group B** | **Group A** | **Group C** |
| Isolation of cardiomyocytes | Inst. Exp. Med. Res. Bldg. 7, 4th floor | Anna Bergan Dahl | **Group C** | **Group B** | **Group A** |