

Public defence: Morten Pensgård Gundersen

Morten Pensgård Gundersen will defend his thesis "Metabolomic Profile of Cataract Patients with and Without Dry Eye Disease before Surgery – Methodology, Prevalence and Global Metabolomic Analysis" for the PhD in Health Sciences.

Event location	Date/Time	Event organizer	Event type
Pilestredet Campus Pilestredet P44: V130 and online	16 April 2026 10:00 to 17:00 Add to calendar	Faculty of Health Sciences Department of Life Sciences and Health	PhD defences

- 10.00: Trial lecture: The Glymphatic System: Function, Dysfunction, and its Importance for the Eye.
- 12.00: Public defence

[You can also watch this event online \(oslomet.zoom.us\)](#). The webinar ID is 674 6420 8828.

The ordinary opponents are:

- First opponent: Associate Professor Marlies Gijs, Maastricht University, The Netherlands
- Second opponent: Senior Researcher/PhD Najdekr Lukás, Palacky University Olomouc, Czech Republic
- Leader of the committee: Associate Professor Martina Martin Tzanova, OsloMet

The leader of the public defense is Professor Colin Charnock, OsloMet.

The main supervisor is Senior Physician/PhD Øygunn Utheim, Oslo University Hospital and "Øyehelseklinikken".

The co-supervisors are Senior Researcher, PhD Mazyar Yazdani, Oslo University Hospital, Group Leader/PhD Katja Benedikte Prestø Elgstøen, Oslo University Hospital, Professor Niclas Karlsson, OsloMet and Associate Professor Xiangjun Chen, University of South-Eastern Norway and "Tørreøynekliviken."

[Read the thesis \(nva.sikt.no\)](#).



Thesis abstract

Cataracts are the most common eye condition affecting the elderly's vision. The only treatment is surgery, which removes the natural lens and replaces it with an artificial one. Modern cataract surgery has evolved into a refractive procedure focused on precision. Achieving this requires thorough preoperative assessment, including ocular surface measurements.

The tear film, critical to the ocular surface, can be disrupted by dry eye disease (DED), leading to inaccurate measurements. DED is a multifactorial condition causing significant discomfort and can be triggered by cataract surgery. Diagnosis combines tests and questionnaires, but the weak correlation between DED symptoms and clinical findings makes accurate diagnosis challenging.

In recent years, technological advancements have enabled more comprehensive studies of the tear film. One promising method is metabolomics, which involves the large-scale analysis of small molecules, referred to as metabolites, found in cells, biofluids, tissues, or organisms.

This thesis aimed to create a specialised method for analysing tear fluid. Additionally, it sought to assess the prevalence of dry eye disease (DED) in patients scheduled for cataract surgery by examining related signs and symptoms. Finally, the established methodology and epidemiological framework were applied to perform an untargeted metabolomic analysis of tear fluid from cataract patients, both those with DED and those without, to uncover potential differences.

The study revealed a significant prevalence of DED, with 55,5 percent of patients affected by the condition. There was also a clear lack of correlation between the signs and symptoms of DED. The established methodology proved effective, particularly with low volume samples, making it especially valuable for DED research. Furthermore, the analysis identified several metabolites of particular interest that could assist in future diagnoses and the development of therapeutic targets.