

CSMOpto Open Science Miniature Microscopy Workshop Application Guidelines

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Workshop Overview

[Campus Alberta Neuroscience](#) (CAN) is proud to support the [Cumming School of Medicine Optogenetics Core Facility](#) (CSMOpto) at the University of Calgary in offering a new workshop in the technique of **miniature microscopy** from Tuesday, November 5th - Friday, November 8th, 2024.

Miniature microscopy enables the precise examination of the activity of specific neuronal populations and allows for the visualization of individual neurons with high spatiotemporal fidelity in awake behaving animals. However, the implementation of this method is hindered by challenging surgeries, difficult experiments and complex data analysis.

This workshop in miniature microscopy aims to offer intensive training to members of the research community who are interested in integrating the technique into their studies, while adhering to open science principles.

Workshop Content

The workshop will take place in person over four days and will include lectures, seminars, demonstrations, and some hands-on work. Topics will include:

- Introduction to Miniature Microscopy
 - Genetically encoded biosensors and optogenetic proteins
 - Model systems and delivery methods
 - General principles and limitations of miniature microscopy
- Miniature Microscopy Data Collection
 - Basic concepts of data collection
 - Pairing recordings with behavioural analyses
 - Combinations with optogenetic stimulation
 - Multi-site and multi-colour recordings
- Surgical Demonstrations
 - GRIN lens implantation
 - Imaging as a targeting aid
 - Post-operative care
- Experimental Demonstrations
 - Scruff-free animal handling training
 - *In vivo* recording on neuronal activity in freely behaving mice
- Miniature Microscopy Data Analysis
 - Data pre-processing
 - ROI definition
- Data Interpretation
 - Signal analysis
 - Computational modeling

There will also be a special Research Seminar presented by [Dr. Axel Nimmerjahn from the Salk Institute](#).

Teaching Team

This workshop will be led by CSM Opto specialists, faculty at the University of Calgary, and representatives from Inscopix Inc.:

- Dr. Alexander Lohman, Director, CSM Opto

- Dr. Taylor Chomiak, Staff Scientist, CSM Opto
- Dr. Tamas Fuzesi, Staff Scientist, CSM Opto
- Leonardo Molina, Staff Scientist, CSM Opto
- Dr. Jianjun Sun, Surgical Specialist, CSM Opto
- Dr. Ibukun Akinrinade, Post-doctoral Fellow, CSM Opto
- Dr. Frank Visser, Manager of HBI Molecular Core Facility
- Dr. Wilten Nicola, Assistant Professor, Department of Cell Biology and Anatomy
- Dr. Becky Fallon, Inscopix Sales Manager, Western Markets
- Dr. Shay Neufeld, Inscopix Senior Director, Data Products and Analytics

For more information on the CSMOpto team, [please visit their website](#).

Key Dates

Applications Open:	August 26, 2024
Application Deadline:	September 20, 2024 at 11:59 PM MT
Notification of Decision:	Early October 2024
Workshop Dates:	November 5-8, 2024

Eligibility

To be eligible for review, applicants must meet the following criteria:

- Academic requirements:
 - Master's students, PhD students, or postdoctoral researchers engaged in neuroscience research with a significant emphasis on neural imaging
 - Principal Investigators may apply, but trainees will be given priority
- Geographic requirements:
 - Applicants affiliated with a Canadian post-secondary institution will be given priority
 - Applicants affiliated with a post-secondary institution outside Canada are eligible to apply
- Additional considerations:
 - Applicants should have a well-defined intention for applying the miniature microscopy technique to their research
 - Applicants must be comfortable viewing animal surgery and handling rodents
 - Proof of Institutional Animal Use Training approvals will be required
 - Prior experience with any programming language is not required

Equity, Diversity, and Inclusion

CAN and CSMOpto recognize the importance of equity, diversity, and inclusion (EDI) in enriching the process and outcome of collaborative scientific inquiry and innovation. We encourage applicants of diverse backgrounds to apply, which will promote the expression of diverse perspectives, approaches, and experiences, including those of underrepresented and disadvantaged groups.

How to Apply

Applications must be submitted electronically through the [Online Application Submission](#). The individual who wishes to attend the workshop must be the one to apply.

It is imperative that the application is proofread before submission; changes to the application after the deadline are not allowed. Only a single copy of an application will be accepted. A list of application questions is provided in Appendix A for reference only.

Applications must be submitted in completion **before 11:59 PM on September 20, 2024**.

Late or incomplete applications will not be considered. It is the sole responsibility of the applicant to ensure the application submission adheres to all requirements and is submitted before the deadline.

By submitting this application, applicants acknowledge that their information will be shared with a review committee for evaluation. CSMOpto and CAN reserve the rights to share information of successful applicants, such as applicant name and institutional affiliation, publicly on our website and social media. Should you have any questions or concerns regarding the sharing of information, please contact abneuro@ucalgary.ca for further guidance.

Review Process

All eligible and complete applications will undergo evaluation by a review committee composed of CSMOpto team members and a representative from CAN.

By submitting this application, applicants acknowledge that it is not possible to completely remove identifying information from applications undergoing review and that reviewers will have access to the application, including submitted CVs, for the purposes of evaluation. Reviewers will be required to sign confidentiality agreements prior to accessing application information.

Applications will be evaluated and ranked on the following criteria:

- Preference for Alberta-based applicants
- Preference for neuroscience trainees
- Qualifications and experience of the applicant
- Justification for attendance and benefit to applicant's program of study or research project
- Benefit and contribution to supervisor's program of neuroscience research

A maximum of 20 applicants will be invited to participate based on the review committee evaluations. CSMOpto and CAN will not enter discussion on specific items in the review process or reasons for the rejection of applications. **All decisions are final and cannot be appealed.**

Applicants will be notified of the review committee's decision in writing by Campus Alberta Neuroscience in **October 2023** (date is tentative and subject to change) and at that time will be required to accept the terms and conditions of the offer. It is the sole responsibility of the applicant to ensure that CAN and CSMOpto are provided with current contact information and to notify of any changes to the contact information provided in the original application.

Terms and Conditions

Acceptance of Offer

Successful applicants must accept their offer within five (5) business days of receiving the notification of decision from CAN. An acceptance form will be provided and must be returned with supporting documentation to CAN by email, signed by all relevant parties, within this timeframe. Any potential conditions or required clarifications and their related timelines will be outlined with the offer. Failure to comply with this requirement may lead to withdrawal of the offer.

By accepting this offer, CAN and CSMOpto reserve the right to share information such as applicant name(s) and affiliated institution publicly on our website and social media. Should you have any questions or concerns regarding the sharing of information, please contact abneuro@ucalgary.ca for further guidance.

Successful applicants, on acceptance of their offer, will be registered for the four-day workshop. Registration is covered by CSMOpto, CAN, the Hotchkiss Brain Institute, Tanenbaum Open Science Institute, and Inscopix Inc. Participants will receive breakfast and lunch for the four workshop days, and for attendees from outside of Calgary, hotel accommodations may be partially covered.

Successful applicants who accept their offer are required to attend all four days of the workshop and provide feedback to workshop coordinators following the final day.

Questions

If you are interested in applying to this workshop and require further information, please contact Campus Alberta Neuroscience at abneuro@ucalgary.ca with the subject line "Open Science Miniature Microscopy Workshop".

About the Partners



UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE



[Cumming School of Medicine
Optogenetics Core Facility](#)



Campus Alberta
Neuroscience



UNIVERSITY OF CALGARY
FACULTY OF VETERINARY MEDICINE

[University of Calgary Faculty
of Veterinary Medicine](#)

[Tanenbaum Open Science
Institute](#)

CSMOpto

The Cumming School of Medicine Optogenetics Core Facility's (CSM Opto) goal is to offer an array of equipment and facilities for the combined use of optogenetic stimulation, fiber photometry, and head-mounted miniscopes with behavioural testing in mice and rats. The facility staff offers expertise in rodent behavioural testing, optogenetics, stereotaxic surgery, data analysis, and technology development. CSM Opto also aims to foster educational development through comprehensive training, support, and teaching for our users. The platform's technology is fully operational, and our most significant impact to date has been supporting Cumming School of Medicine and Hotchkiss Brain Institute research excellence including several *Nature Neuroscience* publications over the past 2 years. For more information, please visit <https://hbi.ucalgary.ca/research/opto/home>.

CAN

Campus Alberta Neuroscience CAN, established in 2012 with support from the Government of Alberta, is a province-wide neuroscience network connecting the Universities of Alberta, Calgary and Lethbridge to increase the impact of neuroscience and mental health research, education and translation, developing the province as an epicenter for neuroscience excellence. Through collaborative partnerships with researchers, government and health system stakeholders, industry and community organizations, CAN supports and accelerates innovative brain and mental health advances that improve brain health, patient care and quality of life in Alberta and beyond. For more information, please visit albertaneuro.ca.

UCVM

The University of Calgary Faculty of Veterinary Medicine (UCVM) is a Canadian veterinary school located in Calgary, Alberta at the University of Calgary. The faculty was established in 2005 to meet Alberta's need for highly-skilled veterinary graduates to support rural Alberta, production animal and equine industries, animal and human health research, and public health. Before the establishment of the Faculty of Veterinary Medicine at the University of Calgary, the only veterinary school in western Canada was the Western College of Veterinary Medicine at the University of Saskatchewan. UCVM offers DVM & Graduate Programs, Advanced Clinical Training, Pathology & Diagnostic Services, and conducts research in animal and human health. For more information, please visit <https://vet.ucalgary.ca/>.

TOSI

The Tanenbaum Open Science Institute (TOSI) was founded to drive

the adoption of Open Science across Canadian neuroscience research institutes. In addition to promoting Open Science within The Neuro, TOSI engages in strategic collaborations and partnerships through its Open Science Support and Partnership Framework. Through the Framework TOSI supports and guides other institutes in adopting Open Science practices and principles and establishes an alliance of neuroscience research institutes across Canada committed to Open Science.



Inscopix Inc.

During and after the workshop, Inscopix will provide attendees with four weeks of access to the Inscopix cloud-based analysis software, IDEAS, for continued, independent exploration of analysis methods based on training and data provided in the workshop. More details about Inscopix can be found on their website (www.inscopix.com) and questions ahead of the workshop about Inscopix technology can be directed to sales.inscopix@bruker.com

Appendix A: Application Questions

Applications must be submitted electronically through the [Online Application Submission](#). The individual who wishes to attend the workshop must be the one to apply.

Below is a complete list of application questions. Please note that this list is meant for reference only and is provided to facilitate the preparation of the application.

The trainee application will consist of:

- **Applicant information**
 - Name, contact (email and phone number), school, current position/degree, faculty, discipline
 - Curriculum vitae in PDF format
 - Should include education/training, positions/employment, honours/awards, publications, presentations, research support, etc.
- **Supervisor information**
 - Name, contact (email and phone number), school, current position, faculty, discipline
- **Applicant experience**
 - Briefly describe your most relevant academic, research, and employment experience. (250 words)
 - Describe your experience with in vivo imaging and behavioural techniques. (*Please note that this experience is not required to attend the workshop. Your answer to this question helps our teaching team adapt the workshop content to the attendees.*) (100 words)
- **Applicant learning and research goals**
 - How will attending the workshop impact your research? (250 words)
 - What makes you a good fit for the workshop? (100 words)
- **Letter from Supervisor**
 - PDF format
 - How will attending the workshop contribute to the applicant's academic program?
 - Will the applicant's attendance at the workshop contribute to your research? If so, how?

The PI application will consist of:

- **Applicant information**
 - Name, contact (email and phone number), school, current position/degree, faculty, discipline
 - Curriculum vitae in PDF format
 - Should include education/training, positions/employment, honours/awards, publications, presentations, research support, etc.
- **Applicant experience**
 - Briefly describe your most relevant academic, research, and employment experience. (250 words)
 - Describe your experience with in vivo imaging and behavioural techniques. (*Please note that this experience is not required to attend the workshop. Your answer to this question helps our teaching team adapt the workshop content to the attendees.*) (100 words)
- **Research impact**
 - How will attending this workshop contribute to your research? (250 words)
 - Describe your research team (number of trainees, staff, etc.). (100 words)
 - Briefly outline your plan to disseminate the knowledge learned from this workshop to your trainees and research staff. (250 words)