

# Pradipta Mukherjee, Ph.D.

# Curriculum Vitae

## BASIC INFORMATION

Assistant Professor  
Centre for Biomedical Engineering  
Indian Institute of Technology Delhi  
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Hauz Khas, New Delhi - 110016, India

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Publication metric: [Google Scholar](#)  
[Linkedin Profile](#)

## RESEARCH INTERESTS

**Biomedical Optics, Optical Coherence Tomography, Microscopy, Polarization Engineering, Computational Imaging.**

## WORK EXPERIENCE

**Indian Institute of Technology Delhi**, India February 2024 – Present  
Assistant Professor  
Centre for Biomedical Engineering (CBME)

**University of Tsukuba**, Tsukuba, Ibaraki, Japan July 2019 – January 2024  
Postdoctoral Researcher  
– Research Theme: “*Label-free functional activity and structural imaging in animal models using optical coherence microscopy*”.  
– Advisor: Prof. Yoshiaki Yasuno, Computational Optics Group (COG).

**Council of Scientific Industrial Research - Central Scientific Instruments Organisation (CSIR-CSIO)**, Chandigarh, India. September 2013 – July 2014  
Senior Project Fellow (SPF)  
– Project: “*Opto- Mechatronics technologies for next-generation sensors and applications*”  
– Optical system design of Head-Up Display (HUD) and Head-Mounted Display (HMD).

## EDUCATION

**Ph.D. in Optical Engineering** 2015 – 2019  
Center for Optical Research and Education (CORE), Utsunomiya University, Japan  
– Thesis Title: “*Measuring chemical and mechanical properties of biological tissues with Mueller matrix polarimetry*”.

**M.Tech in Optics and Optoelectronics** 2013  
Department of Applied Optics and Photonics, University of Calcutta, India

**Post B.Sc-B.Tech in Optics and Optoelectronics** 2011  
Department of Applied Optics and Photonics, University of Calcutta, India

**B.Sc in Physics (Hons)** 2008  
Vidyasagar College, University of Calcutta, India

## PUBLICATIONS

**Complete list of publications can be found in [Google Scholar](#).**

1. Thitiya Seesan, **Pradipta Mukherjee**, Ibrahim Abd El-Sadek, Yiheng Lim, Lida Zhu, Shuichi Makita, and Yoshiaki Yasuno, “Optical-coherence-tomography-based deep-learning scatterer-density estimator using physically accurate noise model,” Biomedcal Optics Express, 15, 2832–2848 (2024).
2. Ibrahim Abd El-Sadek, Rion Morishita, Tomoko Mori, Shuichi Makita, **Pradipta Mukherjee**, Satoshi Matsusaka, and Yoshiaki Yasuno, “Label-free visualization and quantification of

the drug-type-dependent response of tumor spheroids by dynamic optical coherence tomography,” *Scientific Reports* 14, 3366 (2024).

3. Lida Zhu, Shuichi Makita, Junya Tamaoki, Yiqiang Zhu, **Pradipta Mukherjee**, Yiheng Lim, Makoto Kobayashi, and Yoshiaki Yasuno, “Polarization-artifact reduction and accuracy improvement of Jones-matrix polarization-sensitive optical coherence tomography by multi-focus-averaging based multiple scattering reduction,” *Biomedical Optics Express*, 15, 256–276 (2024).
4. **Pradipta Mukherjee**, Shinichi Fukuda, Donny Lukmanto, Thi Hang Tran, Shuichi Makita, Ibrahim Abd El-Sadek, Yiheng Lim, and Yoshiaki Yasuno, “Renal tubular function and morphology revealed in kidney without labeling by three-dimensional dynamic optical coherence tomography ” *Scientific Reports* 13, 15324 (2023).
5. Ibrahim Abd El-Sadek, Larina Tzu-Wei Shen, Tomoko Mori, Shuichi Makita, **Pradipta Mukherjee**, Antonia Lichtenegger, Satoshi Matsusaka, and Yoshiaki Yasuno, “Label-free drug response evaluation of human derived tumor spheroids using three-dimensional dynamic optical coherence tomography,” *Scientific Reports* 13, 15377 (2023).
6. Kiriko Tomita, Shuichi Makita, Naoki Fukutake, Rion Morishita, Ibrahim Abd El-Sadek, **Pradipta Mukherjee**, Antonia Lichtenegger, Junya Tamaoki, Lixuan Bian, Makoto Kobayashi, Tomoko Mori, Satoshi Matsusaka and Yoshiaki Yasuno, “Theoretical model for *en face* optical coherence tomography imaging and its application to volumetric differential contrast imaging,” *Biomedical Optics Express*, 14, 3100–3124 (2023).
7. Rion Morishita, Toshio Suzuki, **Pradipta Mukherjee**, Ibrahim Abd El-Sadek, Yiheng Lim, Antonia Lichtenegger, Shuichi Makita, Kiriko Tomita, Yuki Yamamoto, Tetsuharu Nagamoto, and Yoshiaki Yasuno, “Label-free intratissue activity imaging of alveolar organoids with dynamic optical coherence tomography,” *Biomedical Optics Express*, 14, 2333-2351 (2023).
8. **Pradipta Mukherjee**, Shinichi Fukuda, Donny Lukmanto, Toshiharu Yamashita, Kosuke Okada, Shuichi Makita, Ibrahim Abd El-Sadek, Arata Miyazawa, Lida Zhu, Antonia Lichtenegger, Tetsuro Oshika, and Yoshiaki Yasuno, “Label-free metabolic imaging of non-alcoholic-fatty-liver-disease (NAFLD) liver by volumetric dynamic optical coherence tomography” *Biomedical Optics Express*, **13**, 4071–4086 (2022).
9. Antonia Lichtenegger, Junya Tamaoki, Roxane Licandro, Tomoko Mori, **Pradipta Mukherjee**, Lixuan Bian, Shuichi Makita, Satoshi Matsusaka, Makoto Kobayashi, Bernhard Baumann, and Yoshiaki Yasuno, “Longitudinal investigation of a xenograft tumor zebrafish model using polarization-sensitive optical coherence tomography,” *Scientific Reports* **12**, 15381 (2022).
10. Lida Zhu, Shuichi Makita, Daisuke Oida, Arata Miyazawa, Kensuke Oikawa, **Pradipta Mukherjee**, Antonia Lichtenegger, Martin Distel, and Yoshiaki Yasuno, “Computational refocusing of Jones matrix polarization-sensitive optical coherence tomography and investigation of defocus-induced polarization artifacts” *Biomedical Optics Express*, **13**, 2975–2994 (2022).
11. Antonia Lichtenegger, **Pradipta Mukherjee**, Lida Zhu, Rion Morishita, Kiriko Tomita, Daisuke Oida, Konrad Leskovar, Ibrahim Abd El-Sadek, Shuichi Makita, S. Kirchberger, Martin Distel, Bernhard Baumann, and Yoshiaki Yasuno, “Non-destructive characterization of adult zebrafish models using Jones matrix optical coherence tomography” *Biomedical Optics*

Express, **13**, 2202–2223 (2022).

12. Antonia Lichtenegger, **Pradipta Mukherjee**, Junya Tamaoki, Lixuan Bian, Lida Zhu, Ibrahim Abd El-Sadek, Shuichi Makita, Konrad Leskovar, Makoto Kobayashi, Bernhard Baumann, Yoshiaki Yasuno, “Multicontrast investigation of in vivo wildtype zebrafish in three development stages using polarization-sensitive optical coherence tomography,” *Journal of Biomedical Optics* **27**, 016001 (2022).
13. Thitiya Seesan, Ibrahim Abd El-Sadek, **Pradipta Mukherjee**, Lida Zhu, Kensuke Oikawa, Arata Miyazawa, Larina Tzu-Wei Shen, Satoshi Matsusaka, Prathan Buranasiri, Shuichi Makita, and Yoshiaki Yasuno, “Deep convolutional neural network-based scatterer density and resolution estimators in optical coherence tomography,” *Biomedical Optics Express*, **13**, 168–183 (2022).
14. Ibrahim Abd El-Sadek, Arata Miyazawa, Larina Tzu-Wei Shen, Shuichi Makita, **Pradipta Mukherjee**, Antonia Lichtenegger, Satoshi Matsusaka, and Yoshiaki Yasuno, “Three-dimensional dynamics optical coherence tomography for tumor spheroid evaluation,” *Biomedical Optics Express*, **12**, 6844–6863 (2021).
15. **Pradipta Mukherjee**, Arata Miyazawa, Shinichi Fukuda, Toshiharu Yamashita, Donny Lukmanto, Kosuke Okada, Ibrahim Abd El-Sadek, Lida Zhu, Shuichi Makita, Tetsuro Oshika, and Yoshiaki Yasuno, “Label-free functional and structural imaging of liver microvascular complex in mice by Jones matrix optical coherence tomography,” *Scientific Reports* **11**, 20054 (2021).
16. Ibrahim Abd El-Sadek, Arata Miyazawa, Larina Tzu-Wei Shen, Shuichi Makita, Shinichi Fukuda, Toshiharu Yamashita, Yuki Oka, **Pradipta Mukherjee**, Satoshi Matsusaka, Tetsuro Oshika, Hideki Kano, and Yoshiaki Yasuno, “Optical coherence tomography-based tissue dynamics imaging for longitudinal and drug response evaluation of tumor spheroids,” *Biomedical Optics Express*, **11**, 6231–6248 (2020).
17. **Pradipta Mukherjee**, Tomohisa Horiguchi, Shuhei Shibata, Nathan Hagen, and Yukitoshi Otani, “Quantitative discrimination of biological tissues by micro-elastographic measurement using an epi-illumination Mueller matrix microscope,” *Biomedical Optics Express*, **10**(8), 3847–3859 (2019).
18. **Pradipta Mukherjee**, Nathan Hagen, and Yukitoshi Otani, “Glucose sensing in the presence of scattering by analyzing a partial Mueller matrix,” *Optik*, **180**, 775–781 (2019).
19. **Pradipta Mukherjee**, Shogo Ishida, Nathan Hagen, and Yukitoshi Otani, “Implementation of a complete Mueller matrix polarimeter using dual photoelastic modulators and rotating wave plates,” *Optical Review*, **26**, 23–32 (2019).

#### PATENTS

1. Yoshiaki Yasuno, **Pradipta Mukherjee**, Ibrahim Abd El-Sadek, and Arata Miyazawa, “Evaluation Device, Evaluation Method, and Program,” U.S. patent 20220390357 (December 8, 2022).

#### CONFERENCE PRESENTATION AND INVITED TALKS

- SPIE Photonics West BIOS.
- CLEO (Applications and Technology), San Jose, USA.
- OSA Biophotonics Congress: Biomedical Optics.
- Biomedical Imaging and Sensing Conference, Yokohama, Japan.

- International Workshop on Bioimaging.
- International Symposium of Optomechatronics Technologies.
- Optics and Photonics Japan.
- Japanese Society of Applied Physics.

## AWARDS

### **Young Faculty Award 2024**

– by Indian Institute of Technology Delhi

### **JSPS Postdoctoral Fellowship (Declined) 2023**

– By Japan Society for the Promotion of Science

### **Doctoral research fellowship – “Japanese Government (Monbukagakusho: MEXT)” Scholarship**

- Ministry of Education Culture, Sports, Science and Technology– Govt. of Japan (MEXT), April 2015 – March 2018.

### **National Merit-Cum Scholarship**

- Government of India, 2005-2007.

### **OSA Reviewer Recognition Award**

- By the Optica, Optical Society of America, Year 2021, 2022.

## PROFESSIONAL ACTIVITIES

- Journal Reviewer: Biomedical Optics Express, Optics Express, Applied Optics, Optics Letters
- Society Membership: SPIE, OPTICA (OSA)
- Conference Organizing Committee Member: Photonics Online Meetup (POM) 2023

## HARDWARE AND SOFTWARE SKILLS

### **Instrument development:**

- Technological development of optical coherence tomographic microscope.
- Design and implement a complete and partial Mueller matrix polarimeter using dual photoelastic modulators and rotating wave plates to characterize sample polarization properties fully.
- Developed an epi-illumination Mueller matrix microscope for elastographic measurement of biological tissues.

### **Programming Languages:**

- Python, MATLAB, Labview, Maxima, Zemax, T<sub>E</sub>X (L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>), Git

### **Operating System:**

- Microsoft Windows, Apple Mac OS

## LANGUAGES

- Bengali (mother tongue), Hindi
- Spoken and written English (Advanced level)
- Spoken Japanese (Basic level)