



# Lyotropic myelin structures consisted of phosphatidylcholines

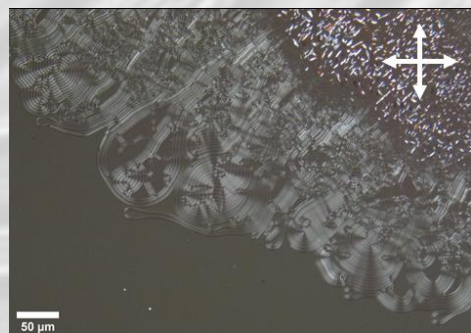
Dominika Benkowska-Biernacka, Katarzyna Matczyszyn

Advanced Materials Engineering and Modelling Group, Wrocław University of Science and Technology, Poland

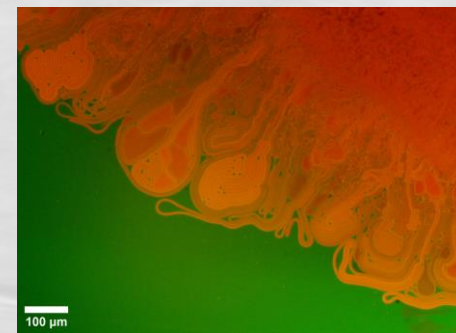
## ➤ Introduction

The well-known example of lyotropic mesophase is myelin sheath which plays a crucial role in action potential propagation. Here, we present formation and analysis of artificial myelin structure consisted of a single type of zwitterionic phospholipids in aqueous environment<sup>1-3</sup>.

## ➤ Polarized light and fluorescence microscopy



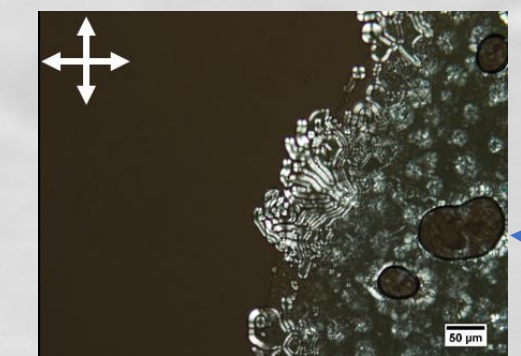
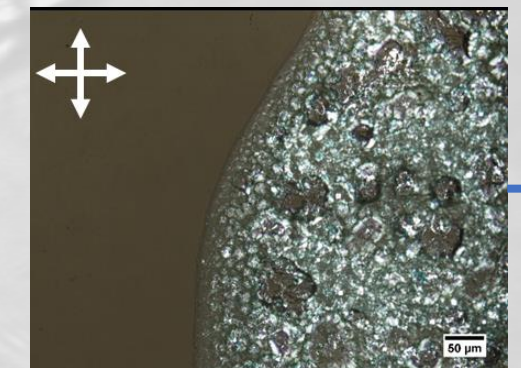
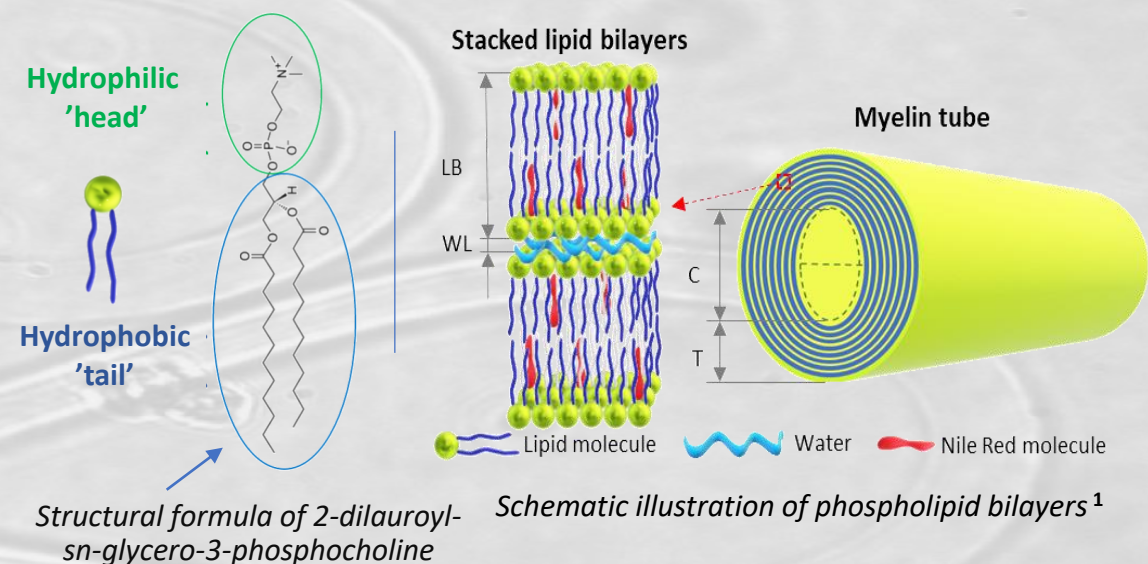
MS might be observed in polarized light as long cylindrical structures with an explicit water core.



Different shapes of MS stained with Nile Red were imaged using an epifluorescence microscope.

## ➤ Sample preparation

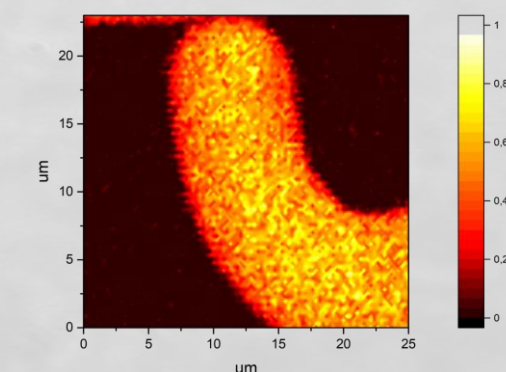
Myelin structures (MS) were formed by phospholipids multilayers in aqueous environment by contact method<sup>4</sup>.



## ➤ Two-photon excited fluorescence microscopy

The shape of myelin structure was clearly depicted on a map showing the intensity of two-photon excited luminescence.

This method can be applied to observe three-dimensional view of MS.



## ➤ Conclusions

- The combination of polarized light and fluorescence microscopy allowed us to study multilayered microstructures.
- The presented results indicate the possibility of application two-photon excited fluorescence microscopy in research on MS.

## Bibliography

- D. Benkowska-Biernacka, I. I. Smalyukh, K. Matczyszyn, *J. Phys. Chem. B*, 124, 52 (2020)
- A. Boullerne, *Exp. Neurol.*, 283, 431 (2016)
- M. Mitov, *Soft Matter*, 13, 4176-4209 (2017)
- Zou L., *Phys. Rev.*, 79, 061502 (2009)