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Dr. Novikova is OSA Senior member, she has served as a Guest Editor of the Journal of Biomedical Optics in 2016. Dr Novikova's research was featured in SPIE "Women in Optics" Planner 2018. Dr. Novikova is a recipient of 2020 SPIE G. G. Stokes Award in Optical Polarization in recognition of her research in Mueller polarimetry for the development of techniques used in predicting and measuring the transfer of polarized light through a turbid media, in particular polarized light propagation via atmospheric transmission and biological tissue.



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POLARIZATION OF LIGHT AS ARIADNE'S THREAD WITHIN THE LABYRINTH OF MEDICAL DIAGNOSTICS

ABSTRACT: Imaging Mueller polarimetry represents an emerging optical technique that makes use of light polarization for a non-invasive diagnostics of tissue. This optical imaging modality explores the extreme sensitivity of polarized light to the microstructure of a sample and provides the most complete information on sample polarimetric properties that can be used for tissue diagnostics. It is known that the malignancies of epithelial tissue represent the majority (80 to 90 %) of all cancers. Hence, probing a superficial epithelial layer of tissue with visible polarized light for early detection of pre-cancerous changes will not be hampered by its shallow penetration depth within scattering tissue and will not make any harm to a patient. Moreover, imaging Mueller

polarimetry does not require tissue staining or using contrast enhancement agents for the detection of pathological zones of tissue and, thus, can be implemented in vivo.

The results of the studies of different types of human tissue (colon, uterine cervix, brain) with the custom-built multi-wavelength wide-field imaging Mueller polarimeter will be presented and discussed. Our findings demonstrate that both polarization (the scalar retardance and the azimuth of the optical axis of uniaxial linear birefringent medium) and depolarization parameters can serve as the reliable optical markers of tissue pathology (e. g. pre-cancer conditions or tumor visualization).

FRIDAY, OCTOBER 23 / 9:00 AM / VIA ZOOM

Zoom Registration ▶ <https://bme.fiu.edu/seminars>



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