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Benjamin Vakoc, PhD, is Associate Professor of Dermatology at Harvard Medical School and a member at the Harvard-MIT Health Sciences and Technology Faculty. After working in a venture-funded start-up that developed optical devices for the telecommunications market, he joined the Wellman Center for Photomedicine at Massachusetts General Hospital to bring optical technologies to the clinic and biology laboratory. His group focuses on the development and translation of optical coherence tomography and related imaging technologies.

ABSTRACT

Functional OCT microscopy of the peripheral nerve

Peripheral nerve injuries (PNIs) affect an estimated 20 million Americans each year. Severe PNIs require surgical repair, often using nerve graft tissues. Understanding the reinnervation dynamics of these repairs is critical to improving functional outcomes. In this work, we demonstrate the use of a vectorial (optic axis) polarization-sensitive OCT system to visualize the internal microanatomy and myelination of the nerves and nerve grafts during healing. We additionally show how polarization-sensitive methods can be combined with OCT angiography to delineate intraneural vessels from those in surrounding tissues, and thereby provide a more complete picture of the nerve's functional revascularization.