

# Multimodal, High-Resolution, Non-invasive *in vivo* Tracking of Subretinal Injection of ARPE19 Cells Labeled with Chain-like Gold Nanoparticle Clusters for Regenerative Medicine

Yannis M. Paulus, M.D., F.A.C.S.

Van Phuc Nguyen, Tianye Zhu, Wen Fan, Wei Qian,  
Bing Liu, Xueding Wang

Department of Ophthalmology & Visual Sciences

Department of Biomedical Engineering

W.K. Kellogg Eye Center, University of Michigan

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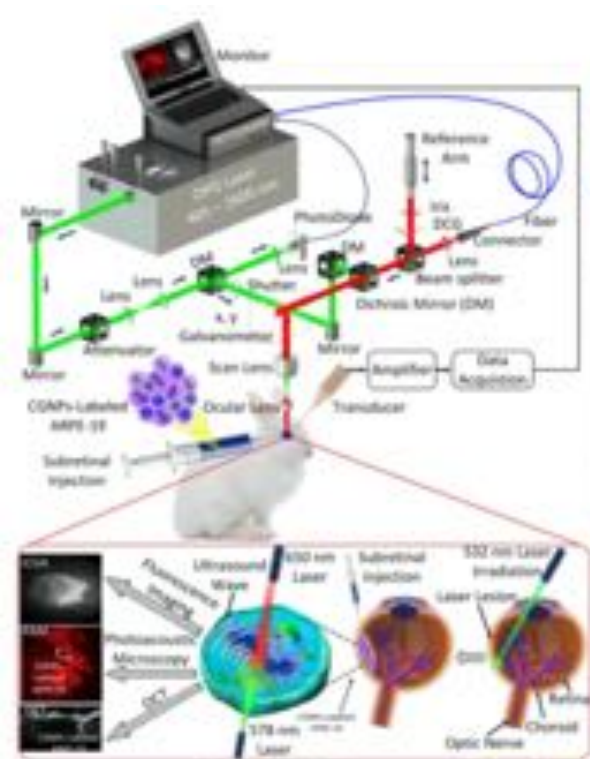
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# Disclosures

- Inventor University of Michigan patents/provisional patents
  - Method and Apparatus for Removing Microvessels
  - RetinaScope Apparatus
  - Photomediated Ultrasound Therapy Method and Apparatus
  - Purely Organic Phosphorescent Nanoparticles for In Vivo Oxygen Sensing
  - Laser Ultrasound Body Sculpting
  - Multi-modal imaging for cell tracking
  - Low energy photoacoustic microscopy (PAM) and combined PAM, dye-based microscopy, and optical coherence tomography
  - Apparatus for testing age-related macular degeneration and method of using the same
- Co-Founder companies PhotoSonoX LLC, EyeSonics LLC, OcuBell.
- Consultant for Oraya Therapeutics, Quattro Consulting, Sonify Biosciences, Allergan Regional Advisory Board, Putnam Associated Consulting, Roda Consulting, ENDRA Life Sciences, MediBeacon Inc, Hedgefog Research Inc
- Will discuss preclinical systems not approved by the U.S. FDA



- Biocompatible functionalized chain-like gold nanoparticle clusters (CGNP) with indocyanine green (ICG) and RGD peptide (ICG@CGNPs-RGD) are explored as a novel exogenous contrast agent for multimodal photoacoustic microscopy (PAM) and optical coherence tomography (OCT) imaging that shift the optical absorption spectra from visible region (520 nm) to the near infrared region (650 nm).
- Subretinal injection of ICG@CGNPs-RGD labeled ARPE-19 cells allowed for evaluation of the fate, distribution, phenotypes, and the function of transplanted ARPE-19 cells longitudinally over 3 months via PAM, OCT, and ICG fluorescence
- ICG@CGNPs-RGD enhanced 650nm photoacoustic signal by 30-fold, OCT signal by 180 %, and fluorescence intensities by 22-fold.
- Simultaneous imaging with PAM and OCT ensures co-registration, allowing for evaluation the transplanted cells within the retina over time.

