

Daniel Palanker

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Professional Interests

Optical and electronic technologies for diagnostic, therapeutic, surgical and prosthetic applications, primarily in ophthalmology:

- Electro-Neural interfaces:
 - Photovoltaic Restoration of Sight
 - Electronic Control of Organs
- Optical imaging and spectroscopy:
 - Interferometric imaging of neural signals
 - Interferometric thermometry
- Laser-Tissue Interactions:
 - Non-damaging retinal laser therapy
 - Ultrafast laser surgery
- Retinal plasticity

Education

- 1996 - 1998: **Postdoctoral fellowship** at Picosecond Free Electron Laser Center, Stanford University, CA
- 1989 - 1995: **Ph.D.** in Applied Physics (with highest honors), the Hebrew U. of Jerusalem, Israel.
- 1979 - 1984: **M.Sc.** in Physics, State University of Armenia, Yerevan, USSR.

Academic career

- 2016 - 2020 *Director*, Hansen Experimental Physics Laboratory, Stanford University.
- 2016 - *Professor by courtesy*, Department of Electrical Engineering, Stanford University.
- 2014 - *Professor*, Department of Ophthalmology, School of Medicine, and Hansen Experimental Physics Laboratory, Stanford University.
- 2007 - 2014 *Associate Professor (Research)*, Department of Ophthalmology, and Hansen Experimental Physics Laboratory, Stanford University.
- 2001 - 2007 *Assistant Professor (Research)*, Department of Ophthalmology, and Hansen Experimental Physics Laboratory, Stanford University.
- 1998 - 2000 *Senior Research Scientist*, Department of Ophthalmology and Hansen Experimental Physics Laboratory, Stanford University.
- 1998 *Research Associate*, Picosecond Free Electron Laser Center, Stanford University.
- 1996 - 1997 *Post Doctoral Research Fellow*, Hansen Experimental Physics Laboratory, Stanford University.
- 1994 - 1996 *Research Scientist*, Laser Center of The Hadassah Hospital, Hebrew University, Jerusalem, Israel.

- 1988 - 1994 *Research Assistant*, Applied Physics Division, The Hebrew University of Jerusalem, Israel.
- 1984 - 1987 *Research Assistant*, Institute of Applied Physics, Academy of Sciences, Yerevan, USSR.

Affiliations

APS - American Physical Society, **SPIE** - The International Society for Optical Engineering, **OSA** – Optical Society of America, **ARVO** - Association for Research in Vision and Ophthalmology, **AAAS** - American Association for the Advancement of Science.

Honors and Awards

- 2024 Translational Research Award for Restoration of Sight in Age-Related Macular Degeneration, by SPIE - International Society for Optics and Photonics.
- 2022 ARVO Silver Fellow
- 2019 Bartimaeus Award, by the World Congress on Artificial Vision “The Eye and The Chip”.
- 2016 Scientific Achievement Award, by the Alcon Research Institute.
- 2016 Bressler Prize in Vision Science, by the Lighthouse Guild.
- 2014 Translational Research Award for development of Non-damaging Retinal Laser Therapy, by SPIE - International Society for Optics and Photonics.
- 2004 Pascal Rol award for the best paper on *Ophthalmic Technologies Conference*, SPIE meeting BIOS 2004 (Photonics West 2004).
- 2001 Winner of the *Collegiate Inventors Competition* of the *US National Inventors Hall of Fame* (advisor of D. Fletcher).
- 2000 First Place Award in *Instrumentation, Pharmaceuticals and Devices*, US Vitreous Society. Awarded for "New Plasma-based Cutting Instrument for Vitreoretinal Surgery" (with M.S. Blumenkranz and S. Sanislo).
- 1995 Dr. Shlomiuk award from the board of The Hebrew University of Jerusalem for outstanding Ph.D. Research.
- 1992 Wolf Foundation scholarship for outstanding doctoral students.
- 1991 Prof. Rabau award of the Israel Society for Fertility Research for the application of the ArF excimer laser to In Vitro Fertilization.

Awards for products

- 2018 Galien Prize in research category, France. In recognition of the PRIMA subretinal prosthesis for treatment of Age-related Macular Degeneration, with Pixium Vision Inc.
- 2012 R&D 100 award for invention and development of the OCT-Guided Femtosecond Laser System for Cataract Surgery, with OptiMedica Inc.
- 2009 Medical Design Excellence Award for invention and development of the Pulsed Electron Avalanche Knife (PEAK), with PEAK Surgical Inc.
- 2007 R&D 100 award for invention and development of the Pattern Scanning Laser Photocoagulator (PASCAL), with M. Blumenkranz and OptiMedica Inc.

Teaching

Introduction to Electro-Neural Interfaces (4 units) [OPHT207](#) and NEPR230.

[Basic Science Course in Ophthalmology](#) (lectures on Ophthalmic Lasers, Retinal Prosthetics and Optoretinography).

Augmenting Human Senses: Enhancing Perception with Technology and Bioscience OTOHNS 206 (lecture related to restoration of sight through biotechnology).

Technology Transfer

More 70 issued patents and other inventions have been successfully transferred to industrial development and manufacturing. Several technologies are in clinical practice world-wide:

- Pulsed Electron Avalanche Knife (PEAK PlasmaBlade)
- Patterned Scanning Laser Photocoagulator (PASCAL)
- OCT-guided Laser System for Cataract Surgery (Catalys)
- Neural stimulation for enhanced tear secretion (TrueTear)

In clinical trials:

- Photovoltaic Retinal Prosthesis (PRIMA).

Other Experience

2017 – present	Member of the Hillenkamp Prize award committee, SPIE
2016 – present	Member of the Bressler Prize award committee, Lighthouse Guild.
2014 – 2020	Member of the Editorial Board, <i>Scientific Reports (Nature Publishing Group)</i> .
2012 – present	Member of the Editorial Board, <i>Translational Vision Science & Technology</i> .
2004 – present	Member of the Editorial Board, <i>Expert Review of Medical Devices</i> .
2009 – present	Member of the Pascal Rol Award Committee, SPIE
2004 – present	Organizing Committee Member, Ophthalmic Technologies Conference, SPIE.
2004 – present	NIH Scientific Review Panels.
2004 – 2011	Department of Veterans Affairs, Scientific Merit Review Advisory Board.

List of publications (in reversed chronological order)

Book Chapters:

- [Basic Principles of the Femtosecond Laser-Based Tissue Surgery](#). G. Schuele and D. Palanker; Chapter 91 (pp 743–758) in [Cataract and Lens Surgery](#). Springer, Cham. 2023.
- Retinal Laser Therapy: Biophysical Basis and Applications. D. Palanker, M.S. Blumenkranz; Chapter 41 in Ryan's Retina, 7th edition, Editors: SriniVas Sadda, Andrew Schachat, Charles Wilkinson, David Hinton, Peter Wiedemann, K. Bailey Freund, David Sarraf (Eds), vol. 1 Elsevier, 2022.
- [Electronic Retinal Prostheses](#), Chapter 1.39 in [The Senses: A Comprehensive Reference](#), 2nd edition; p. 642-668, Bernd Fritzsche (Ed), Elsevier 2020.
- Ophthalmic Laser Therapy and Surgery. D. Palanker. Chapter 15 in the [Handbook of Laser Technology & Applications](#), 2nd Edition. Ed. Chunlei Guo. CRC Press, 2021.
- Visual Prosthesis, Optoelectronic Devices. D. Palanker, Chapter in the [Encyclopedia of Computational Neuroscience](#), D. Jaeger, R. Jung (Eds.). Springer New York, 2018.
- Retinal Laser Therapy: Biophysical Basis and Applications. D. Palanker, M.S. Blumenkranz; Chapter 41 in RETINA, 6th edition, Schachat, Wilkinson, Hinton, SriniVas, Wiedemann (Eds), vol. 2, Elsevier, 2018.
- Non-damaging Photothermal Therapy of the Retina using Endpoint Management. D. Lavinsky , D. Palanker. Chapter 37 in: Henriques J, Duarte A, Quintão T. (eds.) LASER Manual in Ophthalmology - fundamentals and laser clinical practice. Lisbon: SPILM Portuguese Medical Laser Society Publishing;. p.193-6, 2017
- High Resolution Photovoltaic Subretinal Prosthesis for Restoration of Sight. H. Lorach and D. Palanker. Chapter 9 in "[Artificial Vision: a Clinical Guide](#)". P. Gabel (Editor). Springer International Publishing, 2016.

- Restoring Vision to the Blind: Advancements in Vision Aids for the Visually Impaired. The Lasker/IRRF Initiative for Innovation in Vision Science, Chapter 7. F. Werblin and D. Palanker, Translational Vision Science and Technology. Vol. 3, No. 7, pp 54-62, 2014
- Optoelectronic Retinal Prostheses. D. Palanker et.al., Chapter in the Encyclopedia of Computational Neuroscience, D. Jaeger, R. Jung (Eds.). Springer, New York, 2014.
- Photovoltaic Retinal Prosthesis for Restoring Sight to the Blind. D. Palanker, et.al. Chapter 24 in Handbook of Bioelectronics: Directly interfacing electronics and biological systems. S. Carrara and K. Iniewski (Eds). Cambridge University Press, 2014.
- Retinal Laser Therapy: Biophysical Basis and Applications. D. Palanker, M.S. Blumenkranz; Chapter 39 in RETINA, 5th edition, Ryan, Schachat, Wilkinson, Hinton, Sadda, Wiedemann (Eds), vol. 3, Mosby Inc., St. Louis, 2012.
- Imaging Systems and Image-guided Surgery. S.D. Klyce, D. Palanker, K.H. Edwards, R.R. Krueger. Chapter 5 in Textbook of Refractive Laser Assisted Cataract Surgery (ReLACS); by Krueger RR, Talamo JH, Lindstrom RL (Eds). Springer, New York, NY, 2012.
- Delivery of Information and Power to the Implant, Integration of the Electrode Array with the Retina, and Safety of Chronic Stimulation. J. Loudin, A. Butterwick, P. Huie, and D. Palanker. , Chapter 7 in VISUAL PROSTHETICS: Physiology, Bioengineering, Rehabilitation. G. Dagnelie (Editor), Springer 2010.
- High-Resolution Electronic Retinal Prosthesis: Physical Limitations and Design. D. Palanker, A. Vankov, P. Huie, A. Butterwick, I. Chan, M.F. Marmor and M.S. Blumenkranz; Chapter 14 in ARTIFICIAL SIGHT: BASIC RESEARCH, BIOMEDICAL ENGINEERING, AND CLINICAL ADVANCES; M.S. Humayun, J.D. Weiland, G. Chader, E. Greenbaum (Eds.), Springer Series: Biological and Medical Physics, Biomedical Engineering, New York, 2007.
- Retinal Laser Therapy: Biophysical Basis and Applications, D. Palanker, M.S. Blumenkranz, J.J. Weiter; Chapter 22 in RETINA, 4th edition, Ed. S.J. Ryan, vol. 3, Mosby, Inc., St. Louis, MI, 2005.

Online Teaching Materials:

- Ophthalmic Laser Therapy: Mechanisms and Applications. Daniel Palanker. Global Optometry Resource Platform, Brien Holden Vision Institute. University of New South Wales, Sydney, Australia. <http://education.brienholdenvision.org>.
- [Basics of Lasers](#) and [Laser-Tissue Interactions](#). D. Palanker, Online course on Ophthalmic Lasers. American Academy of Ophthalmology.

arXiv, bioRxiv, medRxiv:

- [Accelerated Simulation of Multi-Electrode Arrays Using Sparse and Low-Rank Matrix Techniques](#). Nathan Jensen, Zhijie Charles Chen, Anna Kochnev Goldstein, Daniel Palanker. bioRxiv (August 2024).
- [Enhancing Prosthetic Vision by Upgrade of a Subretinal Photovoltaic Implant in situ](#). Mohajeet B. Bhuckory, Nicharee Monkongpitukkul, Andrew Shin, Anna Kochnev Goldstein, Nathan Jensen, Sarthak V Shah, Davis Pham-Howard, Emma Butt, Roopa Dalal, Ludwig Galambos, Keith Mathieson, Theodore Kamins, and Daniel Palanker. bioRxiv (April 19, 2024).

Refereed Articles:

1. [Light-evoked deformations in rod photoreceptors, pigment epithelium and subretinal space revealed by prolonged and multilayered optoretinography](#). B. Tan, H. Li, Y. Zhuo, L. Han, R. Mupparapu, D. Nanni, V.A. Barathi, D. Palanker, L. Schmetterer, T. Ling. *Nature Comm.* **15**:5156 (2024).

2. [3D electronic implants in subretinal space: long-term follow-up in rodents](#). M. Bhuckory, B.Y. Wang, Z.C. Chen, A. Shin, D. Pham-Howard, S. Shah, N. Monkongpitukkul, L. Galambos, T. Kamins, K. Mathieson, D. Palanker. *Biomaterials* **311**, 122674 (2024).
3. [Prosthetic Visual Acuity with the PRIMA Subretinal Microchip in Patients with Atrophic Age-related Macular Degeneration at 4 years follow-up](#). M.M.K. Muqit, Y. Le Mer, L Olmos de Koo, F.G. Holz, J.A. Sahel, D. Palanker PhD. *Ophthalmology Science*. 7 March 2024, 100510
4. [Three-dimensional electro-neural interfaces electroplated on subretinal prostheses](#). E. Butt, BY Wang, A. Shin, Z.C. Chen, M.B. Bhuckory, S. Shah, L. Galambos, T. Kamins, D. Palanker, K. Mathieson *J. Neural Eng.* **21(1)**: 016030 (2024).
5. [Subretinal photovoltaic implant PRIMA provides central vision in subjects with geographic atrophy due to age-related macular degeneration](#). JA Sahel, Y Le Mer, FG Holz, JN Martel, LC Olmos de Koo, MMK Muqit, D Palanker. *touchREVIEWS in Ophthalmology* 18(1) (2024).
6. [Cellular migration into a subretinal honeycomb-shaped prosthesis for high-resolution prosthetic vision](#). M.B. Bhuckory, BY Wang, Z.C. Chen, A. Shin, T. Huang, L. Galambos, E. Vounotrypidis, K. Mathieson, T. Kamins, D. Palanker. *PNAS* **120(42)**: e2307380120 (2023).
7. [Electronic Retinal Prostheses](#). D. Palanker. *Cold Spring Harbor Perspectives in Medicine* Feb 13; a041525 (2023).
8. [Interferometric thermometry of ocular tissues for retinal laser therapy](#). D. Veysset, Y. Zhuo, J. Hattori, M. Bhuckory, and D. Palanker. *Biomedical Optics Express* **14(1)**: 37-53 (2023).
9. [Electronic Photoreceptors Enable Prosthetic Vision with Acuity Matching the Natural Resolution in Rats](#). B.Y Wang, Z.C. Chen, M. Bhuckory, T.W. Huang, A. Shin, V. Zuckerman, E. Ho, E. Rosenfeld, L. Galambos, T. Kamins, K. Mathieson, D. Palanker. *Nature Comm.* **13**: 6627 (2022).
10. [Photovoltaic implant simulator reveals resolution limits in subretinal prosthesis](#). Z.C. Chen, B.Y. Wang, A. Kochnev Goldstein, E. Butt, K. Mathieson, D. Palanker. *J Neural Eng* **19** 055008 (2022).
11. [Pixel size limit of the PRIMA implants: from humans to rodents and back](#). B.Y. Wang, Z. C. Chen, M. Bhuckory, A. Kochnev Goldstein, D. Palanker. *J Neural Eng* **19** 055003 (2022).
12. [A Smartphone-Based Near-Vision Testing System: Design, Accuracy, and Reproducibility Compared with Standard Clinical Measures](#). Do Gyun Kim, Aaron D. Webel, Mark S. Blumenkranz, Yonguk Kim, Ji Ho Yang, Seung Young Yu, Hyung Woo Kwak, Daniel Palanker, Brian Toy, and David Myung. *Ophthalmic Surg Lasers Imaging Retina* 53:79-84 (2022).
13. [Simultaneous Perception of Prosthetic and Natural Vision in AMD Patients](#). D. Palanker, Y. Le Mer, S. Mohand-Said, J.A. Sahel. *Nature Comm.* **13(1)**: 513 (2022).
14. [Interferometric Imaging of the Thermal Expansion for Temperature Control in Retinal Laser Therapy](#). D. Veysset, T. Ling, Y. Zhuo, *Biomedical Optics Express* **13(2)**: 728-743 (2022).
15. [Questions About the Role of P3HT Nanoparticles in Retinal Stimulation](#). D. Palanker, E.D. Glowacki and D. Ghezzi. *Nature Nanotechnology* **16**: 1330–1332 (2021).
16. [Real-Time Optimization of the Current Steering for Visual Prosthesis](#). Z.C. Chen, B.Y. Wang, D. Palanker Proceedings of the 10th International IEEE/EMBS Conference on Neural Engineering (NER) 2020. DOI: 10.1109/NER49283.2021.9441400.
17. [Vertical-junction Photodiodes for Smaller Pixels in Retinal Prostheses](#). T.W Huang, T.I Kamins, Z.C. Chen, B. Wang, M. Bhuckory, L. Galambos, E. Ho, T. Ling, S. Afshar, A. Shin, V. Zuckerman, J.S Harris, K. Mathieson, D. Palanker. *J. Neural Eng.* 18 036015 (2021)
18. [Functional and Structural Effects of Nondamaging Retinal Laser Therapy for Macular Telangiectasia Type 2: A Randomized Sham-Controlled Clinical Trial](#). D. Lavinsky, M.O. da Silva, A. Chaves, W. Schneider, F. Lavinsky, D. Palanker. *Retina* 41(3): 487-494 (2021).
19. [Decoding Network-mediated Retinal Response to Electrical Stimulation: Implications for Fidelity of Prosthetic Vision](#). E. Ho, A. Shmakov, D. Palanker. *J. Neural Eng.* 17 066018 (2020).

20. [Mechanisms of Light-induced Deformations in Photoreceptors](#). K.C. Boyle, Z. Chen, T. Ling, V.P. Pandiyan, J. Kuchenbecker, R. Sabesan, D. Palanker. *Biophysical Journal* 119: 1481–1488 (2020)
21. [The Optoretinogram Reveals the Primary Steps of Phototransduction in the Living Human Eye](#). V.P. Pandiyan, A.M. Bertelli, J. Kuchenbecker, K.C. Boyle, T. Ling, Z.C. Chen, B.H. Park, A. Roorda, D. Palanker, R. Sabesan. *Science Advances* 6: eabc1124 (2020).
22. [On Optimal Coupling of the ‘Electronic Photoreceptors’ into the Degenerate Retina](#). P. Werginz, B. Wang, Z.C. Chen, and D. Palanker. *J. Neural Eng.* 17: 045008 (2020).
23. [Harmonic-Balance Circuit Analysis for Electro-Neural Interfaces](#). Z.C. Chen, B. Wang, D. Palanker. *J. Neural Eng.* 17 035001 (2020).
24. [Local photoreceptor degeneration causes local pathophysiological remodeling of retinal neurons](#) B. Denlinger, Z. Helft, M. Telias, H. Lorach, D. Palanker, and R.H. Kramer. *JCI Insight*. 5(2): e132114 (2020).
25. [High-speed interferometric imaging reveals dynamics of neuronal deformation during the action potential](#) T. Ling, K.C. Boyle, V. Zuckerman, T. Flores, C. Ramakrishnan, K. Deisseroth, and D. Palanker. *PNAS* 117 (19): 10278–10285 (2020).
26. [Photovoltaic Restoration of Central Vision in Atrophic Age-Related Macular Degeneration](#). D. Palanker, Y. Le Mer, S. Mohand-Said, M.M.K. Muqit, J.A. Sahel. *Ophthalmology*, 127(8): 1097-1104 (2020).
27. [Current Distribution on Capacitive Electrode-Electrolyte Interfaces](#). Z.C. Chen, L. Ryzhik, D. Palanker. *Phys. Rev. Applied* 13, 014004 (2020).
28. [Cortical Interactions between Prosthetic and Natural Vision](#). T. Arens-Arad, N. Farah, R. Lender, A. Moshkovitz, T. Flores, D. Palanker, Y. Mandel. *Current Biology* 30: 1–7 (2019).
29. [Performance of Complex Visual Tasks using Simulated Prosthetic Vision via Augmented-Reality Glasses](#). E. Ho, J. Boffa, D. Palanker. *Journal of Vision* 19(13): 22, 1–10 (2019).
30. [Chronic Electrical Stimulation for Tear Secretion: Lacrimal vs. Anterior Ethmoid Nerve](#). A.L. Kossler, M. Brinton, Z.M. Patel, R. Dalal, C.N. Ta, D. Palanker. *The Ocular Surface* 17(4): 822-827 (2019).
31. [Retinal Laser Therapy Preserves Photoreceptors in a Rodent Model of MERTK-Related Retinitis Pigmentosa](#). S. Kang; H. Lorach; M.B. Bhuckory; Yi Quan; R. Dalal; D. Palanker. *Translational Vision Science & Technology* 8(4): 19 (2019).
32. [Characteristics of Prosthetic Vision in Rats with Subretinal Flat and Pillar Electrode Arrays](#). E. Ho, Xin Lei, T. Flores, H. Lorach, T. Huang, L. Galambos, T. Kamins, J. Harris, K. Mathieson and D. Palanker. *J. Neural Eng.* 16(6): 066027 (2019).
33. [Honeycomb-Shaped Electro-Neural Interface Enables Cellular-Scale Pixels in Subretinal Prosthesis](#). T. Flores, T. Huang, M. Bhuckory, E. Ho, Z. Chen, R. Dalal, L. Galambos, T. Kamins, K. Mathieson & D. Palanker. *Scientific Reports (Nature)* 9: 10657 (2019).
34. [Transplantation of Mature Photoreceptors in Rodents With Retinal Degeneration](#). H. Lorach, S. Kang, M. Bhuckory, A. Trouillet, R. Dalal, M. Marmor, D. Palanker. *Translational Vision Science & Technology* 8(3): 30 (2019).
35. [Stem Cell Therapies, Gene-based Therapies, Optogenetics, and Retinal Prosthetics: Current State and Implications for the Future](#). E.H. Wood, P.H. Tang, I. De la Huerta, E. Korot, S. Muscat, D. Palanker; G.A. Williams. *Retina* 39(5):820-835 (2019).
36. [Feasibility of Intraocular Projection for Treatment of Intractable Corneal Opacity](#). S.Y. Shim; S. Gong, M. Rosenblatt, D. Palanker, A. Al-Qahtani, M.G. Sun, Q. Zhou, L. Kanu, F. Chau, C.Q. Yu. *Cornea*: 38 (4): 523–27 (2019).
37. [Full-Field Interferometric Imaging of Propagating Action Potentials](#). T. Ling, K. C. Boyle, G. Goetz, Peng Zhou, Yi Quan, Felix S. Alfonso, Tiffany W. Huang, D. Palanker. *Light: Science and Applications (Nature)* 7(1):107 - (2018).

38. [Femtosecond Lasers for Ophthalmic Surgery Enabled by Chirped Pulse Amplification](#). D. Palanker. *New England Journal of Medicine* **379**: 2267-2269 (2018). PMID: 30575460
39. [Long-term Rescue of Photoreceptors in a Rodent Model of Retinitis Pigmentosa Associated with MERTK Mutation](#) H. Lorach, S. Kang, R. Dalal, M. B. Bhuckory, Y. Quan, and D. Palanker. *Scientific Reports (Nature)* **8**: 11312, 1-10 (2018).
40. [Restoring Sight with Retinal Prostheses](#). D. Palanker and G. Goetz. *Physics Today*. July 18, pp. 29-35 (2018).
41. [Mechanisms of Electrical Vasoconstriction](#). M. Brinton, Y. Mandel, I. Schachar and D. Palanker. *J. NeuroEngineering and Rehabilitation* **15**:43 (2018).
42. [Temporal structure in spiking patterns of ganglion cells defines perceptual thresholds in rodents with subretinal prosthesis](#). E. Ho, H. Lorach, G. Goetz, F. Laszlo, X. Lei, T. Kamins, J.C. Mariani, A. Sher, and D. Palanker. *Scientific Reports (Nature)*, **8**: 3145 (2018).
43. [Interferometric mapping of material properties using thermal perturbation](#). G. Goetz, T. Ling, T. Gupta, S. Kang, J. Wang, P. Gregory, H. Park, D. Palanker. *PNAS*, **115** (11): E2499-E2508 (2018).
44. [Optimization of pillar electrodes in subretinal prosthesis for enhanced proximity to target neurons](#). T. Flores, X. Lei, T. Huang, H. Lorach, R. Dalal, L. Galambos, T. Kamins, K. Mathieson and D. Palanker. *Journal of Neural Engineering* **15**: 036011 (13pp) (2018).
45. [Spatio-temporal Characteristics of Retinal Response to Network-Mediated Photovoltaic Stimulation](#). E. Ho, R. Smith, G. Goetz, X. Lei, L. Galambos, T.I. Kamins, J. Harris, K. Mathieson, D. Palanker, A. Sher. *Journal of Neurophysiology*. **119**: 389 – 400 (2018).
46. [Optophysiology of Cardiomyocytes: Characterizing Cellular Motion with Quantitative Phase Imaging](#). C. Cordeiro, O.J. Abilez, G. Goetz, T. Gupta, Y. Zhuge, O. Solgaard, and D. Palanker. *Biomedical Optics Express* **8**(10): 4652-4662 (2017).
47. [Comparison of Continuous-Wave and Micropulse Modulation in Retinal Laser Therapy](#). J. Wang, R. Dalal, and D. Palanker. *Investigative Ophthalmology and Visual Science* **58**: 4722–4732 (2017).
48. [Enhanced Tearing by Electrical Stimulation of the Anterior Ethmoid Nerve](#). M. Brinton; A.L. Kossler; Z.M. Patel; J. Loudin; M. Franke; C.N. Ta; D. Palanker . *Investigative Ophthalmology and Visual Science* **58**(4): 2341-2348 (2017).
49. [Deafferented Adult Rod Bipolar Cells Create New Synapses with Photoreceptors to Restore Vision](#). C. Beier, A. Hovhannisyann, S. Weiser, J. Kung, S. Lee, D.Y. Lee, P. Huie, R. Dalal, D. Palanker, A. Sher. *Journal of Neuroscience* **37**(17): 4635-4644 (2017).
50. [Nondamaging Retinal Laser Therapy for Treatment of Central Serous Chorioretinopathy: What is the Evidence?](#) E.H. Wood, P.A. Karth, S.R. Sanislo, D.M. Moshfeghi, D. Palanker. *Retina* **37**(6):1021-1033 (2017).
51. [Evolution of Concepts and Technologies in Ophthalmic Laser Therapy](#). D. Palanker. *Annual Review of Vision Science* **2**:295-319 (2016).
52. [Electronic Approaches to Restoration of Sight](#). G. Goetz and D. Palanker. *Reports on Progress in Physics* **79**: 096701 (29pp) (2016).
53. [SiC protective coating for photovoltaic retinal prosthesis](#). X. Lei, S. Kane, S. Cogan, H. Lorach, L. Galambos, P. Huie, K. Mathieson, T. Kamins, J. Harris and D. Palanker. *Journal of Neural Engineering* **13**: 046016 (12pp) (2016).
54. [Non-Damaging Retinal Laser Therapy: Rationale and Applications to the Macula](#). D. Lavinsky; J. Wang; P. Huie; R. Dalal; S.J. Lee; D.Y. Lee; D. Palanker. *Investigative Ophthalmology and Visual Science* **57** (6): 2488-2500 (2016). [Supplementary Figures](#)

55. [Optimization of Return Electrodes in Neurostimulating Arrays](#). T. Flores, G. Goetz, X. Lei, and D. Palanker. *Journal of Neural Engineering* **13**: 036010 (11pp) (2016).
56. [Implantation of Modular Photovoltaic Subretinal Prosthesis](#). D.Y. Lee, H. Lorach, P. Huie, D. Palanker. *Ophthalmic Surgery, Lasers and Imaging Retina*. **47**: 171-174 (2016).
57. [Photovoltaic Pixels for Neural Stimulation: Circuit Models and Performance](#). D. Boinagrov, X. Lei, G. Goetz, T.I. Kamins, K. Mathieson, L. Galambos, J.S. Harris, and D. Palanker. *IEEE Trans. Biomed. Circuits and Systems* **10(1)**: 85-97 (2016).
58. [Electronic Enhancement of Tear Secretion](#). M. Brinton, J.L. Chung, A. Kossler, K.H. Kook, J. Loudin, M. Franke and D. Palanker. *Journal of Neural Engineering* **13**: 016006 (8pp) (2016).
59. [Finesse of Transparent Tissue Cutting by Ultrafast Lasers at Various Wavelengths](#). J. Wang, G. Schuele, D. Palanker. *Journal of Biomedical Optics* **20(12)**: 125004 (2015).
60. [Retinal Safety of Near Infrared Radiation in Photovoltaic Restoration of Sight](#). H. Lorach, J. Wang, D.Y. Lee, R. Dalal, P. Huie, D. Palanker. *Biomedical Optics Express* **7(1)**: 13-21 (2015).
61. [Interactions of Prosthetic and Natural Vision in Animals with Local Retinal Degeneration](#). H. Lorach; X. Lei; L. Galambos; T. Kamins; K. Mathieson; R. Dalal; P. Huie; J. Harris; D. Palanker. *Investigative Ophthalmology and Visual Science* **56**: 7444-7450 (2015).
62. [Contrast Sensitivity with a Subretinal Prosthesis and Implications for Efficient Delivery of Visual Information](#). G. Goetz, R. Smith, Xin Lei, L. Galambos, T. Kamins, K. Mathieson, A. Sher, and D. Palanker. *Investigative Ophthalmology and Visual Science* **56**: 7186–7194 (2015).
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2. [Spatially-resolved phase signal extraction in OCT reveals distinct light-evoked responses of photoreceptors and retinal pigment epithelium](#). T. Ling, B. Tan, H. Li, Y. Zhuo, L. Han, R. Mupparapu, V.A. Barathi, D. Palanker, L. Schmetterer. *Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVIII*; SPIE BiOS, 2024, San Francisco, California. vol. PC12830 (2024).
3. [Sensory Particles with Optical Telemetry](#). K. Ganesan*, T. A. Flores, B.Q. Le, D.G. Muratore, N. Patel, S. Mitra, B. Murmann, and D. Palanker. *IEEE International Symposium on Circuits and Systems (ISCAS)* October 2020.
4. [Heat shock protein expression as guidance for the therapeutic window of retinal laser therapy](#). J. Wang, P. Huie, R. Dalal, S. Lee, G. Tan, D. Lee, D. Lavinsky, D. Palanker. *Ophthalmic Technologies XXVI*, SPIE vol. 9693 (2016).
5. Photovoltaic Restoration of High Visual Acuity in Rats with Retinal Degeneration. H. Lorach, G. Goetz, Y. Mandel, R. Smith, D. Boinagrov, X. Lei, R. Dalal, P. Huie, T. Kamins, J. Harris, K. Mathieson, A. Sher, D. Palanker. *IEEE Conference*, Montpellier, France, April (2015).
6. [Role of molecular photodissociation in ultrafast laser surgery](#). J. Wang, G. Schuele, P. Huie, D.V. Palanker. *Optical Interactions with Tissue and Cells XXVI*, SPIE, vol. 9321 (2015).
7. [Photovoltaic Restoration of Sight with High Visual Acuity in Rats with Retinal Degeneration](#). D. Palanker, G. Goetz, H. Lorach, Y. Mandel, R. Smith, D. Boinagrov, X. Lei, T. Kamins, J. Harris, K. Mathieson, A. Sher. *Ophthalmic Technologies XXIII*, SPIE, vol. 9307 (2015).
8. [In-vivo Performance of Photovoltaic Subretinal Prosthesis](#). Y. Mandel, G. Goetz, D. Lavinsky, P. Huie, K. Mathieson, L. Wang, T. Kamins, R. Manivanh, J. Harris, D. Palanker. *Ophthalmic Technologies XXI*, SPIE, vol. 8567 (2013).
9. [Optical Modulation of Transgene Expression in Retinal Pigment Epithelium](#). D. Palanker, D. Lavinsky, T. Chalberg, Y. Mandel, P. Huie, R. Dalal, M. Marmor. *Ophthalmic Technologies XXI*, SPIE, vol. 8567 (2013).
10. [Restoring Sight to the Blind](#). D. Palanker, K. Mathieson, J. Loudin, Y. Mandel, G. Goetz, D. Lavinsky, L. Wang, P. Huie, T. Kamins, J. Harris, R. Smith and A. Sher. *SPIE Newsroom, Biomedical Optics & Medical Imaging*, 30 July (2012)
11. [Photovoltaic Retinal Prosthesis for Restoring Sight to the Blind: Implant Design and Fabrication](#). L. Wang, K. Mathieson, T.I. Kamins, J. Loudin, L. Galambos, J.S. Harris and D. Palanker; *SPIE*, vol. 8248 (2012)
12. [Photovoltaic Retinal Prosthesis](#). J. Loudin, K. Mathieson, T. Kamins, L. Wang, L. Galambos, P. Huie, A. Sher, J. Harris, D. Palanker; *Ophthalmic Technologies XIX*, *SPIE*, vol. 7885 (2011).
13. [Tissue Dissection with Ultrafast Laser using Extended and Multiple Foci](#). I. Toytman, A. Silbergleit, D. Simanovski, D. Palanker, *Optical Interactions with Tissues and Cells XXI*, SPIE vol. 7562 (2010).

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15. [Improved Safety of Retinal Photocoagulation with a Shaped Beam and Modulated Pulse](#). C. Sramek, J. Brown, Y.M. Paulus, H. Nomoto, D. Palanker. *Ophthalmic Technologies XX, SPIE*, vol. 7550 (2010).
16. [A Curvable Silicon Retinal Implant](#). R. Dinyari, J. Loudin, P. Huie, D. Palanker, P. Peumans. Proceedings of the Electron Devices Meeting (IEDM), Baltimore, IEEE International. (2009)
17. High resolution optoelectronic retinal prosthesis, J. Loudin, R. Dinyari, P. Huie, A. Butterwick, P. Peumans, D. Palanker; *Ophthalmic Technologies XIX, SPIE*, vol. 7163 (2009).
18. [Computational model of retinal photocoagulation and rupture](#), C. Sramek, Y. Paulus, H. Nomoto, P. Huie, Daniel Palanker; *Ophthalmic Technologies XIX, SPIE*, vol. 7163 (2009).
19. [Solid state lasers for wide-field CARS microscopy](#), D. Simanovskii, I. Toytman, D. Palanker, *Solid State Lasers XVIII: Technology and Devices, SPIE*, vol. 7193 (2009).
20. [Progress Towards a High-Resolution Retinal Prosthesis](#), A. Butterwick, A. Vankov, P. Huie, K. Vijayraghavan, J. Loudin, D. Palanker, *Ophthalmic Technologies XVII, SPIE*, vol. 6426A (2007).
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22. [Dynamic range of safe electrical stimulation of the retina](#). A.F. Butterwick, A. Vankov, P. Huie, D.V. Palanker. *Ophthalmic Technologies XVI, SPIE* vol. **6138** (2006).
23. [Noninvasive Dosimetry and Monitoring of TTT using Spectral Imaging](#). G. Schuele, F.E. Molnar, D. Yellachich, E. Vitkin, L.T. Perelman, D. Palanker. *Ophthalmic Technologies XVI, SPIE* vol. **6138** (2006).
24. [Plasma-Mediated Transfection of RPE](#). D. Palanker, T. Chalberg, A. Vankov, P. Huie, F.E. Molnar, A. Butterwick, M. Calos, M. Marmor, M.S. Blumenkranz. *Ophthalmic Technologies XVI, SPIE* vol. **6138** (2006).
25. [Optical monitoring of thermal effects in RPE during heating](#). G. Schuele, P. Huie, D. Yellachich, F. Molnar, C. O'Connell-Rodwell, E. Vitkin, L. T. Perelman, D. Palanker. *Ophthalmic Technologies XV, SPIE* vol.**5688A** (2005).
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27. [Cellular tolerance to pulsed heating](#). D. Simanovskii, M. Sarkar, A. Irani, C. O'Connell-Rodwell, C. Contag, A. Schwettman, D. Palanker. *Optical Interactions with Tissue and Cells XVI, SPIE* vol. **5695** (2005).
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29. [Electro-adhesive forceps for tissue manipulation](#). A. Vankov, P. Huie, M.S. Blumenkranz, D. Palanker. *Ophthalmic Technologies*, vol.**5314**, SPIE (2004).
30. [Non-invasive Monitoring of the Thermal Stress in RPE Using Light Scattering Spectroscopy](#). G. Schuele, P. Huie, A. Vankov, E. Vitkin, H. Fang, E.B. Hanlon, L.T. Perelman, D. Palanker, *Ophthalmic Technologies*, vol.**5314**, SPIE (2004).
31. Optimization of the Pulsed Electron Avalanche Knife for Anterior Segment Surgery. D. Palanker, A.Vankov, K.Bilbao, M.Marmor, M.Blumenkranz, *Ophthalmic Technologies*, SPIE, vol. **4951**: 56-61, (2003).
32. Pulsed Liquid Microjet for Intravascular Injection, D. Palanker, D. Fletcher, P. Huie, J. Miller, M. Marmor, M. Blumenkranz, *Ophthalmic Technologies*, vol. **4611**, SPIE (2002).

33. Effect of the Probe Geometry on Dynamics of Cavitation, D. Palanker, A. Vankov, J. Miller, *Laser-Tissue Interactions XIII*, vol. **4617** SPIE (2002).
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35. On Image formation in Near-field Infrared Microscopy, D. M. Simanovskii, D. V. Palanker, P. Huie, T.I. Smith, *Scanning and Force Microscopies for Biomedical Applications II*, SPIE, vol. **3922**, (2000).
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37. [Microheater as an Alternative to Lasers for In-Vitro Fertilization Applications](#), D.V. Palanker, I. Turovets, R. Glazer, B.E. Reubinoff, D. Hilman, A. Lewis, *Laser-Tissue Interaction X*, SPIE, vol. **3601** (1999).
38. Electrical Alternative to Pulsed Lasers in Vitreoretinal Surgery, Palanker D., Turovets I., Lewis A., *Ophthalmic Technologies VII*, SPIE, vol. **2971** (1997).
39. Electric Discharge-Induced Cavitation: A Competing Approach to Pulsed Lasers for Performing Microsurgery in Liquid Media, Palanker D., Turovets I., Lewis A, *Laser-Tissue Interaction VIII*, SPIE, vol. 2975 (1997).
40. Vitreoretinal Surgery with the 193 nm Excimer Laser, Palanker D., Hemo I., Turovets I., Zauberman H., Lewis A., *Ophthalmic Technologies IV*, SPIE, vol. 2126, (1994).
41. Soft Tissue Removal by the 193 nm Excimer Laser in Strongly Absorbing Liquid Environment, Palanker D., Hemo I., Turovets I., Lewis A., *Laser/Tissue Interaction V*, SPIE, vol. 2134, (1994).
42. Cold Laser Technique for Cell Surgery, Palanker D., Ohad S., Lewis A., Laufer N, *SPIE* ,vol. 1646, *Laser-Tissue Interaction III*, (1992).
43. Cold Laser Microsurgery of the Retina with a Syringe Guided 193nm Excimer Laser, Lewis A., Palanker D., Hemo I., Pe'er J., Zauberman H., *SPIE* ,vol. 1423, *Ophthalmic Technologies*, pp. 98 - 102 (1991).

Issued US Patents:

- | | |
|-------------------------------|---|
| US 11,278,448 | Fluid delivery alignment system |
| US 10,888,454 | Piezoelectric fluid dispenser |
| US 10,874,553 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 11,278,448 | Fluid delivery alignment system |
| US 10,874,553 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 10,722,718 | Systems and methods for treatment of dry eye |
| US 10,328,262 | Stimulation devices and methods |
| US 10,143,846 | Systems and methods for treatment of dry eye |
| US 10,130,510 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 9,872,798 | System and method for determining dosimetry in ophthalmic photomedicine |
| US 9,821,159 | Stimulation devices and methods |
| US 9,750,640 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 9,693,905 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 9,693,904 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |
| US 9,693,903 | Apparatus for patterned plasma-mediated laser ophthalmic surgery |

US [9,572,484](#) [System and method for providing analysis of visual function using a mobile device with display](#)

US [9,498,295](#) [Optimization of laser therapy](#)

US [9,271,870](#) [Apparatus for patterned plasma-mediated laser ophthalmic surgery](#)

US [9,254,168](#) [Electro-thermotherapy of tissue using penetrating microelectrode array](#)

US [9,192,518](#) [System for treating ophthalmic target tissue using a treatment pattern of lesions](#)

US [8,918,181](#) [Systems and methods for treatment of dry eye](#)

US [8,709,001](#) [Method and apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,690,862](#) [Apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,616,216](#) [Patterned laser treatment](#)

US [8,591,501](#) [Coherent fiber bundle system and method for ophthalmic intervention](#)

US [8,568,393](#) [Computer guided patterned laser trabeculoplasty](#)

US [8,500,724](#) [Method and apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,496,650](#) [Method and apparatus for photothermal therapy with adjustable spatial and/or temporal beam profile](#)

US [8,425,497](#) [Method and apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,414,572](#) [Electrosurgery apparatus with partially insulated electrode and exposed edge](#)

US [8,409,180](#) [Patterned laser treatment](#)

US [8,403,921](#) [Method and apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,394,084](#) [Apparatus for patterned plasma-mediated laser trephination of the lens capsule and three dimensional phaco-segmentation](#)

US [8,336,555](#) [System and method for determining dosimetry in ophthalmic photomedicine](#)

US [8,323,276](#) [Method for plasma-mediated thermo-electrical ablation with low temperature electrode](#)

US [8,283,171](#) [Method and apparatus for avalanche-mediated transfer of agents into cells](#)

US [8,177,783](#) [Electric plasma-mediated cutting and coagulation of tissue and surgical apparatus](#)

US [8,105,324](#) [Methods and devices for the non-thermal, electrically-induced closure of blood vessels](#)

US [8,101,169](#) [Ocular gene therapy using avalanche-mediated transfection](#)

US [8,043,286](#) [Method and apparatus for plasma-mediated thermo-electrical ablation](#)

US [7,923,251](#) [Method and apparatus for avalanche-mediated transfer of agents into cells](#)

US [7,789,879](#) [System for plasma-mediated thermo-electrical surgery](#)

US [7,766,903](#) [Patterned Laser Treatment of the Retina](#)

US [7,736,361](#) [Electrosurgical system with uniformly enhanced electric field and minimal collateral damage](#)

US [7,556,621](#) [Optically controlled microfluidic chip](#)

US [7,447,547](#) [Neural prosthesis based on photomechanical deflectors and tactile sensory cells](#)

US [7,357,802](#) [Electrosurgical system with uniformly enhanced electric field and minimal collateral](#)

	damage
US 7,238,185	Method and apparatus for plasma-mediated thermo-electrical ablation
EU 1079754	Method and apparatus for pulsed plasma-mediated electrosurgery in liquid media
US 7,058,455	Interface for making spatially resolved electrical contact to neural cells in a biological neural network
US 7,047,080	Self-sufficient retinal prosthesis powered by intraocular photovoltaic cells
US 6,939,378	Microfabricated tissue as a substrate for pigment epithelium transplantation
US 6,913,605	Microfluidic devices and methods for producing pulsed microfluidic jets in a liquid environment
US 6,780,178	Method and apparatus for plasma-mediated thermo-electrical ablation
US 6,730,075	Surgical probe for use in liquid media
US 6,352,535	Method and a device for electro microsurgery in a physiological liquid environment
US 6,135,998	Method and apparatus for pulsed plasma-mediated electrosurgery in liquid media
US 6,039,726	Method and apparatus for concentrating laser beams
US 5,288,288	Method and a device for cold laser microsurgery with highly localized tissue removal

Recent Invited Talks (last 5 years):

Distinguished Speaker Series, UCI Center for Translational Vision Research, Irvine March 2024.
 “Photovoltaic Restoration of Sight in Age-Related Macular Degeneration”

Wainstock Lecture on Ophthalmic Innovation, Kresge Eye Institute, Detroit, MI. January 2023
 “Ophthalmic Optoelectronics: From Imaging to Surgery and Neurostimulation”.

The Amsterdam Institute of Neuroscience, March 2021.
 “Photovoltaic Restoration of Sight in Atrophic Macular Degeneration”.

Center for Neuroengineering and Therapeutics, University of Pennsylvania, November 2020.
 “Photovoltaic restoration of sight in Age-Related Macular Degeneration”.

Distinguished visiting faculty lecture. Gavin Herbert Eye Institute at UC Irvine, January 2020.
 “Photovoltaic restoration of sight in atrophic AMD and the underlying mechanisms of prosthetic vision”

Invited speaker. Fudan University, Shanghai, and Zhejiang University in Hangzhou, May 2019
 “Photovoltaic Restoration of Sight in Macular Degeneration”.

Invited speaker. OSA Biophotonics Congress, Tucson, AZ. April 2019
 “Full-Field Interferometric Imaging of Action Potentials”.

Invited Lecture. Department of Chemistry, University of Chicago, October 2018
 “Photovoltaic Restoration of Sight in Retinal Degeneration”.

Invited speaker. Macula Today annual meeting. Rome, Italy. October 2018.
 “Photovoltaic Restoration of Sight in Age-Related Macular Degeneration”.

Invited speaker. Conference on Neural Interfaces. Ramat Gan, Israel, March 2018.
 “Photovoltaic Restoration of Sight in Retinal Degeneration”.

Keynote Speaker, Afeka Conference on Resoration of Sight. Tel Aviv, Israel, January 2018.
 “Prosthetic Vision Mediated by Subretinal Photovoltaic Arrays”.

Distinguished Lecturer on Medical Engineering, Jet Propulsion Laboratory, Pasadena, CA, July 2017

Invited Lecture: "Electronic Augmentation of Body Functions: progress in electro-neural interfaces".

ETH, Zurich, June 2017.

Invited Lecture: "Electro-neural Interfaces in Ophthalmology: from retinal prosthetics to dry eye therapy".

Winter School of Bioelectronics, Kirchberg, Austria, March 2017.

Invited Tutorial: "Photovoltaic Restoration of Sight with High Visual Acuity"

Department of Ophthalmology, University of Munich, Germany. March 2017

"Photovoltaic Restoration of Sight in Rodents with Retinal Degeneration"

"Non-Damaging Retinal Laser Therapy: Rational and Applications to the Macula"

Symposium of the Stanford Center for Mind, Brain, and Computation, 2017

Invited talk: "Restoration of sight with subretinal photovoltaic arrays".

Vanderbilt Biophotonics Seminar, Nashville, December 2016.

"Photovoltaic Restoration of Sight in Rodents with Retinal Degeneration"

Robert and Gerry Ligon Lectureship lecture at Vision Research Center, Kresge Eye Institute, Detroit.
May 2016

"Photovoltaic Restoration of Sight in Rodents with Retinal Degeneration"

"Non-Damaging Retinal Laser Therapy: Rational and Applications to the Macula"

Annual Meeting of the Israeli Society for Vision and Eye Research. Ramat Gan, March 2016

Keynote talks: "Non-damaging laser therapy of the macula: mechanisms and applications"

"Photovoltaic restoration of sight in animals with retinal degeneration".

Annual Meeting on Angiogenesis, Exudation and Degeneration. Miami, February 2016.

Invited Talk: "Non-Damaging Laser Therapy of the Macula: Mechanisms and Applications"

Development and in-vivo testing of the photovoltaic retinal prosthesis with pixels smaller than 40 um for replacement of the photoreceptors lost due to retinal injury or disease.

FA9550-17-1-0237 (PI)

04/01/2017– 03/31/2020

Air Force Office of Scientific Research

Title: “Transplantation of Photoreceptors for Restoration of Sight”

The goal of this project is to transplant sheets of photoreceptors into subretinal space of rats with retinal degeneration and study their integration with the host retina.

U01 EY025501 (co-investigator)

A. Roorda (PI)

5/1/2015 – 30/4/2020

Title: “Interferometric Optophysiology of Human Retina”

The goal of this project is to develop interferometric system for optical monitoring of neural activity in the retina.

W81XWH-15-1-0009

(DoD)

D. Palanker (PI)

02/01/2015 – 01/31/2018

Title: “Photovoltaic Retinal Prosthesis for Restoring Sight to Patients Blinded by Retinal Injury or Degeneration”.

This project is focused on verification of biocompatibility and safety of the photovoltaic retinal prosthesis for its transfer into clinical testing. It also includes studies of the associated image processing.

R01 EY018608

D. Palanker (PI)

7/1/2013 – 6/30/2018

Title: "High Resolution Photovoltaic Retinal Prosthesis".

The goal of this BRP grant is the development of the high-resolution photovoltaic retinal prosthesis for restoration of sight, and testing its performance in animal models of retinal degeneration.

R01 EY023020

A. Sher (PI)

1/1/2013 – 12/31/2017

Title: "Restoration of retinal structure and function after selective photocoagulation of photoreceptors".

Focus of this project is in structural and functional studies of the retinal plasticity following retinal injury. In particular, we study rewiring of the photoreceptors shifting into the damage area.

FA9550-10-10503 (AFOSR)

D. Palanker (PI)

5/1/2014 – 4/30/2017

Title: “Electronic Control of Hemorrhage in Non-compressible Wounds”.

The goal of this project is the development and testing of the microstimulator for vasoconstriction of arteries and veins in animal models of vascular injury.

R01 EY023259

D. Palanker (PI)

4/1/2013 – 3/31/2017

Title: "Electronic Stimulator of Lacrimal Gland".

The goal of this project is to study response of the lacrimal gland to electrical stimulation of the afferent and efferent neurons innervating the lacrimal system, and development of microstimulator for treatment of Dry Eye disease.

W81XWH-12–10575 (DoD)

D. Palanker (PI)

10/1/2012 – 3/31/2014

Title: “Restoration of the Retinal Structure and Function after Injury”.

The goal of this grant was establishment of the animal models of retinal injury resulting in local selective loss of photoreceptors, and assessment of the maximum extent of their migration into the lesion.

R01 EY018608

D. Palanker (PI)

7/1/2009 – 6/30/2013

Title: "High Resolution Optoelectronic Retinal Prosthesis".

The goal of this BRP grant was the development of the high-resolution photovoltaic retinal prosthesis and testing its performance in-vitro.

R01 EY12888 D. Palanker (PI) 1/1/2001 – 12/31/2007
Title: "Pulsed Electron Avalanche Knife for Intraocular Microsurgery".
Development and in-vivo testing of the Pulsed Electron Avalanche Knife for ocular surgery.

Air Force Office of Scientific Research. A. Schwettman (PI) 1/1/2003 – 12/31/2010
Title: "Stanford Picosecond Free Electron Laser Center"
This grant provided operational support for FEL. Studies were focused on interactions of picosecond infrared and visible lasers with biological and polymer materials and applications to imaging and ablation.

RG-03-0042 (Whitaker Foundation) D. Palanker (PI) 9/1/2003 – 8/31/2006
Title: "Plasma Scalpel for Microsurgery"
Development of electrical techniques for tissue dissection and manipulation in microsurgical applications.

Bio-X Research Grant, Stanford. Role: PI 10/1/2008 – 9/31/2010
Title: "Optoelectronic Retinal Prosthesis"
Development of the optoelectronic retinal prosthetic system for restoring sight in patients with retinal degeneration.

Optobionics Research Grant. Role: PI 6/1/2006 – 5/31/2007
Title: "Electronic Retinal Prosthesis"
Development and testing of the optoelectronic retinal prosthetic system for restoring sight in patients with retinal degeneration.

Whitaker Foundation Biomedical Engineering Grant Role: PI
RG-03-0042. 9/1/2003 – 8/31/2006
Title: "Plasma Scalpel for Microsurgery"
Development of the electronic techniques for tissue dissection and manipulation for microsurgical applications.

NIH R01 EY12888 Role: PI 1/1/2001 – 12/31/2003
Title: "Pulsed Electron Avalanche Knife for Intraocular Microsurgery".
Development and in-vivo testing of the Pulsed Electron Avalanche Knife for ocular surgery.

Bio-X grant: Stanford University Role: PI 1/1/2003 – 7/30/2004
Title: "Optical Thermometry"
Development of optical technique for non-invasive monitoring of cellular thermal stress in the retina during hyperthermal laser treatments.

Carl Zeiss GmbH Research Grant Role: PI 4/1/2000-3/1/2003
Title: "Evaluation of Commercial Prototype of PEAK Technology"
Evaluation of the surgical performance of a commercial prototype of the Pulsed Electron Avalanche Knife produced by Carl Zeiss.

Stanford Incentive Fund Role: PI 1/1/1999 – 12/31/1999
Title: "Electric Alternative to Lasers for Vitreoretinal Surgery".
Initial testing phase (pilot study) of the idea of the nanosecond pulsed plasma mediated high voltage discharge on microelectrode as a replacement of pulsed lasers in vitreoretinal surgery.

National Science Foundation Role: co- PI DBI-989778 2/1/1999 – 12/31/2002

Title: "Fast Infrared Imaging with sub-wavelength Resolution using a Transient Near-Field Probe
Development and study of the tipless near-field infrared microscope for "chemical" imaging of
biological samples using the mid-infrared part of the spectrum. The near-field probe was generated
optically by picosecond pulses of visible laser using effect of photo-induced reflectivity in
semiconductors.