Erdost Yildiz, MD PhD

Marie Sklodowska-Curie Individual Postdoctoral Fellow
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SUMMARY

- Expert in small-scale robotics, neuro-electrophysiology, and medical imaging; collaborating researcher of several international healthcare institutions, universities, and industrial partners.
- Neuroscientist and ophthalmology clinician with 8+ years of experience in clinical and preclinical studies, who has FELASA EU Function A+B+C+D certificates and laboratory manager experience with a GenTech S1 & S2 project leader accreditation.
- Author of 40 peer-reviewed journal publications, including 10 as the first and co-first articles, and developer of several medical image analysis software packages.
- Principal investigator on several research projects with approx. € 900K in funding, including the EU Marie Curie, CyberValley Innovation, and co-advisor of 12 graduate students.

A) Education & Training

MPI for Intelligent Systems	Stuttgart, Germany	Medical Robotics	PostDoc, 2021 – present
Koç University	Istanbul, Turkey	Neuroscience	Ph.D., 2017 – 2021
Hacettepe University	Ankara, Turkey	Medicine	M.D., 2009 – 2016
University of Ljubljana	Ljubljana, Slovenia	Medicine	*Erasmus+ Exch.*, 2015

B) Research & Professional Experience

2024 – present	CyberValley Innovation Postdoctoral Fellow, MPI for Intelligent Systems
2021 – 2024	Marie Skłodowska-Curie Postdoctoral Fellow, MPI for Intelligent Systems
2017 – 2021	Research & Training Graduate Assistant, Koç University, Turkey
2016 – 2017	Emergency Physician, Siirt Eruh State Hospital, Turkey

C) Awards & Fellowships

2024 – **CyberValley Innovation Fellowship**, CyberValley GmbH & Carl-Zeiss-Stiftung
2023 – **MPG Diversity Excellence Funding**, Max Planck Society
2023 – **MAX!MIZE Start-up Phase 1 Funding**, Max Planck Innovation GmbH
2022 – **Marie Skłodowska-Curie Individual Postdoctoral Fellowship**, European Commission
2021 – **Individual Young Entrepreneurship Grant (BiGG)**, The Scientific and Technological

Research Council of Turkey (TÜBİTAK)

2021 – **Academic Excellence Award**, Koç University

2019 – **Developing Country Eye Researcher Fellowship**, Association for Research in Vision and Ophthalmology (ARVO)

2019 – **Young Investigator Award**, European Association for Vision and Eye Research (EVER)

2018 – **National Outstanding Success Scholarship**, The Scientific and Technological Research Council of Turkey (TÜBİTAK)

D) Teaching & Supervision

Koç University

Undergraduate Courses as Lecturer

Semester	Course Code	Course Title	Faculty	Class
Fall 2019	MEDI110	Cellular & Molecular Basis of Medicine I	Medicine	Junior
Spring 2020	MEDI111	Cellular & Molecular Basis of Medicine II	Medicine	Junior
Fall 2020	MEDI110	Cellular & Molecular Basis of Medicine I	Medicine	Junior
Spring 2021	MEDI111	Cellular & Molecular Basis of Medicine II	Medicine	Junior

Graduate Student Supervision

1. Hümeyra Nur Kaleli, PhD candidate, 2020 – 2025
2. Ghazalah Narimanfar, MSc, 2019 – 2022 *(currently PhD student at University of Bologna)*
3. Gülsüm Deniz, MSc, 2020 – 2023 *(currently PhD student at Ruhr University Bochum)*
4. Çiğdem Pehlivan, MSc candidate, 2021 – 2024

Max Planck Institute for Intelligent Systems

Undergraduate Training Programs

1. *MAXMINDS: Mentoring for Inclusion and Diversity in Science* - Project Coordinator
2. *CaCTüs: Computation & Cognition Tübingen Summer Internship* - Project Mentor
3. *IMPRS-IS: International Max Planck Research School for Intelligent Systems* - Project Trainer
4. *Robotics Institute Germany* - Project Trainer

Graduate Student Supervision

1. Mertcan Han, PhD candidate at ETH Zürich, 2021 – present
2. Fan Wang, PhD candidate at ETH Zürich, 2021 – present
3. Kaan Kutay Özmen, MD PhD candidate at Koç University, 2021 – present
4. Laura Kondrataviciute, PhD candidate at University of Toronto, 2022 – present
5. Linda Werneck, PhD candidate at University of Stuttgart, 2022 – present
6. Izlen Erenoglu, PhD candidate at ETH Zürich, 2023 – present
7. Minjo Park, PhD candidate at ETH Zürich, 2023 – present

8. Serra Ersoy, MSc candidate at Sabancı University, 2023 – 2025

E) Publications in Peer-Reviewed Journals

*(as of 26 April 2025; * indicates first co-authorship, $^{+}$ indicates corresponding authorship)*
Google Scholar – Citations: 697, H-index: 16
Web of Science – Citations: 563, H-index: 14

1. **Erdost Yıldız^{+}**, Ugur Bozuyuk, Eray Yildiz, Fan Wang, Mertcan Han, Alp Can Karacakol, Devin Sheehan, Yan Yu, and Metin Sitti^{+}. Magnetically controllable and degradable millis-cale swimmers as intraocular drug implants. ***Advanced Materials*** *(under revision)*, 2025.
2. Cigdem Ardic, Almila Sarigul-Sezenoz, **Erdost Yıldız^{+}**, and Sirel Gur-Gungor^{+}. Automated quantitative examination of macular perfusion in behcet's uveitis on optical coherence to-mography angiography images. ***Ocular Immunology and Inflammation*** *(under revision)*, 2025.
3. Andrés Rodríguez-Camargo, **Erdost Yıldız**, Diego Juela, Felix Fischer, Daniel Graf, Bibhuti Rath, Christian Ochsenfeld, Matthias Bauer, Metin Sitti, Liang Yao, and Bettina V Lotsch^{+}. Covalent organic framework solid solutions for combined near-infrared photodynamic and drug delivery cancer therapy. ***Nature Communications*** *(under revision)*, 2025.
4. Fan Wang, **Erdost Yıldız^{+}**, Xose Luis Dean-Ben, Yan Yu, Daniil Nozdriukhin, Wenbin Kang, Shuaizhong Zhang, Jelena Zinnanti, Devin Sheehan, Ren Hao Soon, Shuxin Lyu, Daniel Razansky^{+}, and Metin Sitti^{+}. Magnetic metal-organic frameworks-based nanopar-ticles for high-capacity targeted drug delivery under real-time medical imaging. ***Science Robotics*** *(under revision)*, 2025.
5. Myungjin Park, Ugur Bozuyuk, **Erdost Yıldız**, Jungwon Yoon, and Metin Sitti^{+}. Boundary-regulated locomotion of surface-rolling microrobots on inclined surfaces. ***Advanced Intelli-gent Systems*** *(under revision)*, 2025.
6. Burak Aslan*, Ugur Bozuyuk*, Kivanc Gorgulu, **Erdost Yıldız**, Hakancan Ozturk, Lucia Liotta, Volker Heinemann, Hana Alguel^{+}, and Metin Sitti^{+}. Anisotropic surface microrollers for endovascular navigation: A computational analysis with a case study in hepatic perfu-sion. ***Advanced Theory and Simulations*** *(accepted)*, 2025.
7. Dila Atak, **Erdost Yıldız**, Esra Özkan, Mohammadreza Yousefi, Ayşe Özkan, Aysu Bilge Yılmaz, Ali Burak Kızılırmak, Iman Asaad Alnajjar, Çiçek Kanar, Zeynep Lal Caan, Şakir Ümit Zeybek, Cem İsmail Küçükali, Erdem Tüzün, Yasemin Gürsoy-Özdemir^{+}, and Atay Vural^{+}. Longitudinal investigation of brain and spinal cord pericytes after inducible pdgfrβ+ cell ablation in adult mice. ***Journal of Neurochemistry***, 169(3):e70035, 2025.
8. Dong Wook Kim*, Paul Wrede*, Hector Estrada, **Erdost Yıldız**, Jelena Lazovic, Aarushi

Bhargava, Daniel Razansky[+], and Metin Sitti[+]. Hierarchical nanostructures as acoustically manipulatable multifunctional agents in dynamic fluid flow. ***Advanced Materials***, 36(50): 2404514, 2024.

9. Serra Ersoy, **Erdost Yıldız[+]**, Ziyu Ren, Mingchao Zhang, Hongchuan Zhang, Selcan Karaz, Mertcan Han, Anitha Shiva, Muhammad Yunusa, Cengiz Kaya, Bahattin Koc[+], and Metin Sitti[+]. Fabrication of gold nanoflower-coated photosensitive meta-structures using pμsl 3d printing for hyperthermia applications. ***ACS Applied Polymer Materials***, 6(17):10807–10823, 2024.
10. Tianlu Wang*, Yingdan Wu*, **Erdost Yıldız***, Selin Kanyas, and Metin Sitti[+]. Clinical translation of wireless soft robotic medical devices. ***Nature Reviews Bioengineering***, 2: 470–485, 2024.
11. Mertcan Han, **Erdost Yıldız**, Ugur Bozuyuk, Asli Aydin, Yan Yu, Aarushi Bhargava, Selcan Karaz, and Metin Sitti[+]. Janus microparticles-based targeted and spatially-controlled piezoelectric neural stimulation via low-intensity focused ultrasound. ***Nature Communications***, 15(1):2013, 2024.
12. Ugur Bozuyuk*, Paul Wrede*, **Erdost Yıldız***, and Metin Sitti[+]. Roadmap for clinical translation of mobile microrobotics. ***Advanced Materials***, 36:2311462, 2024.
13. Paul Wrede*, Amirreza Aghakhani*, Ugur Bozuyuk, **Erdost Yıldız**, and Metin Sitti[+]. Acoustic trapping and manipulation of hollow microparticles under fluid flow using a single-lens focused ultrasound transducer. ***ACS Applied Materials & Interfaces***, 2023.
14. Linda Werneck, Mertcan Han, **Erdost Yıldız**, Marc-André Keip[+], Metin Sitti[+], and Michael Ortiz[+]. A simple quantitative model of neuromodulation, part 1: Ion flow through neural ion channels. ***Journal of the Mechanics and Physics of Solids***, 182:105457, 2024.
15. Mingchao Zhang, Aniket Pal, Zhiqiang Zheng, Gaurav Gardi, **Erdost Yıldız**, and Metin Sitti[+]. Hydrogel muscles powering reconfigurable micro-metastructures with wide-spectrum programmability. ***Nature Materials***, 22(10):1243–1252, 2023.
16. Ugur Bozuyuk, **Erdost Yıldız**, Mertcan Han, Sinan Ozgun Demir, and Metin Sitti[+]. Size-dependent locomotion ability of surface microrollers on physiologically relevant microtopographical surfaces. 19(47):2303396, 2023.
17. Varun Sridhar*, **Erdost Yıldız***, Andrés Rodríguez-Camargo, Xianglong Lyu, Liang Yao, Paul Wrede, Amirreza Aghakhani, Birgul M Akolpoglu, Filip Podjaski, Bettina V Lotsch[+], and Metin Sitti[+]. Designing covalent organic framework-based light-driven microswimmers towards therapeutic applications. ***Advanced Materials***, 35(25):2301126, 2023.
18. M Giray Ersöz, Mümin Hocaoğlu, Işıl Sayman Muslubaş, Serra Arf, **Erdost Yıldız[+]**, and Murat Karaçorlu[+]. Artifact-removed quantitative analysis of choriocapillaris flow voids. ***Turkish Journal of Ophthalmology***, 53(1):37, 2023.

19. Cem Kesim, Sevval Nur Bektas, Zeynep Kulali, **Erdost Yıldız**, M Giray Ersoz, Afsun Sahin[+], Cigdem Gunduz-Demir[+], and Murat Hasanreisoglu[+]. Henle fiber layer mapping with directional optical coherence tomography. ***Retina***, 42(9):1780–1787, 2022.
20. Ren Hao Soon*, Ziyu Ren*, Wenqi Hu, Ugur Bozuyuk, **Erdost Yıldız**, Meng Li, and Metin Sitti[+]. On-demand anchoring of wireless soft miniature robots on soft surfaces. ***Proceedings of the National Academy of Sciences***, 119(34):e2207767119, 2022.
21. Tianlu Wang*, Halim Ugurlu*, Yingbo Yan, Mingtong Li, Meng Li, Anna-Maria Wild, **Erdost Yıldız**, Martina Schneider, Devin Sheehan, Wenqi Hu, and Metin Sitti[+]. Adaptive wireless millirobotic locomotion into distal vasculature. ***Nature Communications***, 13(1): 4465, 2022.
22. Onuralp Karatum, **Erdost Yıldız**, Humeyra Nur Kaleli, Afsun Sahin, Burak Ulgut, and Sedat Nizamoglu[+]. Ruo2 supercapacitor enables flexible, safe, and efficient optoelectronic neural interface. ***Advanced Functional Materials***, 32(31):2109365, 2022.
23. Mertcan Han, **Erdost Yıldız**, Hümeyra Nur Kaleli, Selcan Karaz, Guncem Ozgun Eren, Itir Bakis Dogru-Yuksel, Erkan Senses, Afsun Şahin, and Sedat Nizamoglu[+]. Tissue-like optoelectronic neural interface enabled by pedot: Pss hydrogel for cardiac and neural stimulation. ***Advanced Healthcare Materials***, 11(8):2102160, 2022.
24. **Erdost Yıldız**[*+], Dilara Aydemir*, Noushin Zibandeh, Eda Kuşan, Koray Gümüş, Özge İlhan Saraç, Melisa Zişan Karslıoğlu, Nurullah Çağıl, and Afsun Şahin[+]. Investigation of mitophagy biomarkers in corneal epithelium of keratoconus patients. ***Current Eye Research***, 47(5):661–669, 2022.
25. Ayse Yildiz Tas*, Burak Mergen*, **Erdost Yıldız**, Betul N Bayraktutar, Ekrem Çelik, Afsun Sahin[+], and Ceyhun Arici[+]. Interobserver and intraobserver agreements of detection of demodex infestation by in vivo confocal microscopy. ***Beyoglu Eye Journal***, 7(3):0–0, 2022.
26. Ayesha Gulzar*, **Erdost Yıldız**[*+], Hümeyra N Kaleli, Muhammad A Nazeer, Noushin Zibandeh, Anjum N Malik, Ayşe Y Taş, Ismail Lazoğlu, Afsun Şahin, and Seda Kizilel[+]. Ruthenium-induced corneal collagen crosslinking under visible light. ***Acta Biomaterialia***, 147:198–208, 2022.
27. Esra Özkan*, Yağmur Çetin-Taş*, Emine Şekerdağ, Ali B Kızılırmak, Ali Taş, **Erdost Yıldız**, Hale Yapıcı-Eser, Serçin Karahüseyinoğlu, Müjdat Zeybel, and Yasemin Gürsoy-Özdemir[+]. Blood–brain barrier leakage and perivascular collagen accumulation precede microvessel rarefaction and memory impairment in a chronic hypertension animal model. ***Metabolic Brain Disease***, 36(8):2553–2566, 2021.
28. Ozgun Melike Gedar Totuk*, **Erdost Yıldız***, Adriano Mollica, Kerem Kabadayi, and Afsun Sahin[+]. The opioid peptide biphalin modulates human corneal epithelial wound healing in vitro. ***Journal Français d'Ophtalmologie***, 44(9):1403–1412, 2021.

29. Syeda Rubab Batool, Muhammad Anwaar Nazeer, **Erdost Yıldız**, Afsun Sahin, and Seda Kizilel[+]. Chitosan-anthracene hydrogels as controlled stiffening networks. ***International Journal of Biological Macromolecules***, 185:165–175, 2021.
30. Tankut Uzun, Hamdi Çaklı, Didem Turgut Coşan, Şaziye Armağan İncesulu, Ercan Kaya, İbrahim Uğur Çalış[+], and **Erdost Yıldız[+]**. In vitro study on immune response modifiers as novel medical treatment options for cholesteatoma. ***International Journal of Pediatric Otorhinolaryngology***, 145:110743, 2021.
31. **Erdost Yıldız***[+], Abdullah Taha Arslan*, Ayşe Yıldız Taş, Ali Faik Acer, Sertac Demir, Afsun Şahin[+], and Duygun Erol Barkana[+]. Generative adversarial network based automatic segmentation of corneal subbasal nerves on in vivo confocal microscopy images. ***Translational Vision Science & Technology***, 10(6):33–33, 2021.
32. Deniz Marangoz, Cagri Oner, Martin Schicht, Didem Turgut Cosan, Friedrich Paulsen, **Erdost Yıldız**, Noushin Zibandeh, and Afsun Sahin[+]. The effect of androgens on proinflammatory cytokine secretion from human ocular surface epithelial cells. ***Ocular Immunology and Inflammation***, 29(3):546–554, 2021.
33. Mertcan Han*, Houman Bahmani Jalali*, **Erdost Yıldız**, Mohammad Haroon Qureshi, Afsun Şahin, and Sedat Nizamoglu[+]. Photovoltaic neurointerface based on aluminum antimonide nanocrystals. ***Communications Materials***, 2(1):19, 2021.
34. Onuralp Karatum*, Mohammad Mohammadi Aria*, Guncem Ozgun Eren, **Erdost Yıldız**, Rustamzhon Melikov, Shashi Bhushan Srivastava, Saliha Surme, Itir Bakis Dogru, Houman Bahmani Jalali, Burak Ulgut, Afsun Sahin, Ibrahim Halil Kavakli, and Sedat Nizamoglu[+]. Nanoengineering inp quantum dot-based photoactive biointerfaces for optical control of neurons. ***Frontiers in Neuroscience***, 15:652608, 2021.
35. Shashi Bhushan Srivastava*, Rustamzhon Melikov*, **Erdost Yıldız**, Ugur Meric Dikbas, Sadra Sadeghi, Ibrahim Halil Kavakli, Afsun Sahin, and Sedat Nizamoglu[+]. Bulk-heterojunction photocapacitors with high open-circuit voltage for low light intensity photostimulation of neurons. ***Journal of Materials Chemistry C***, 9(5):1755–1763, 2021.
36. Shashi Bhushan Srivastava*, Rustamzhon Melikov*, **Erdost Yıldız**, Mertcan Han, Afsun Sahin, and Sedat Nizamoglu[+]. Efficient photocapacitors via ternary hybrid photovoltaic optimization for photostimulation of neurons. ***Biomedical Optics Express***, 11(9):5237–5248, 2020.
37. Mertcan Han*, Shashi Bhushan Srivastava*, **Erdost Yıldız**, Rustamzhon Melikov, Saliha Surme, Itir Bakis Dogru-Yuksel, Ibrahim Halil Kavakli, Afsun Sahin, and Sedat Nizamoglu[+]. Organic photovoltaic pseudocapacitors for neurostimulation. ***ACS Applied Materials & Interfaces***, 12(38):42997–43008, 2020.
38. Noushin Zibandeh*, **Erdost Yıldız***, Berna Özer, Ayse Yildiz Tas, and Afsun Sahin[+]. An-

drogen suppresses hyperosmolarity-induced inflammatory mediators in human corneal epithelial cells. ***Cornea***, 39(7):886–891, 2020.

39. **Erdost Yıldız**$^{+}$, Noushin Zibandeh, Berna Özer, and Afsun Şahin. Effects of type 2 diabetes mellitus on gene expressions of mouse meibomian glands. ***Current Eye Research***, 45(1): 72–80, 2020.
40. Houman Bahmani Jalali, Onuralp Karatum, Rustamzhon Melikov, Ugur Meric Dikbas, Sadra Sadeghi, **Erdost Yıldız**, Itir Bakis Dogru, Guncem Ozgun Eren, Cagla Ergun, Afsun Sahin, Ibrahim Halil Kavakli, and Sedat Nizamoglu^{+}. Biocompatible quantum funnels for neural photostimulation. ***Nano Letters***, 19(9):5975–5981, 2019.

F) Conference Proceedings Fully Reviewed Prior to Publication

1. **Erdost Yıldız**$^{+}$, Ugur Bozuyuk, Gulsen Aybar Tural, Mehmet Efe Tiryaki, Muhammad Turab Ali Khan, Mertcan Han, Anitha Shiva, Abdon Pena-Francesch, and Metin Sitti^{+}. Digital light processing 3d printing method for magnetically controllable intraocular dexamethasone implants. ***Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting***, 65(7):3980–3980, 2024.
2. **Erdost Yıldız**, Mertcan Han, Linda Werneck, Marc-André Keip^{+}, Metin Sitti^{+}, and Michael Ortiz^{+}. Experimental model for strain-induced mechanical neurostimulation on human progenitor neurons. ***Federation of European Neuroscience Schools (FENS) Forum***, 2024.
3. Laura Kondrataviciute, Minesh Kapadia, Jimmy George, Hien Chau, **Erdost Yıldız**, Taufik Valiante, Luka Milosevic, Lorraine V. Kalia, and Suneil K. Kalia^{+}. Depressive-like phenotype induced by aav-mediated overexpression of human -synuclein in midbrain dopaminergic neurons. ***Federation of European Neuroscience Schools (FENS) Forum***, 2024.
4. **Erdost Yıldız***, Varun Sridhar*, Andrés Rodríguez-Camargo, Xianglong Lyu, Liang Yao, Paul Wrede, Amirreza Aghakhani, Birgül Mükrime Akolpoglu, Filip M Podjaski, Bettina V Lotsch^{+}, and Metin Sitti^{+}. Designing covalent organic framework-based light-driven microswimmers towards intraocular theranostic applications. ***Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting***, 64(8):5025–5025, 2023.
5. **Erdost Yıldız***$^{+}$, Ayesha Gulzar*, Hümeyra Nur Kaleli, Muhammad Anwaar Nazeer, Noushin Zibandeh, Anjum Naeem Malik, Ayse Yildiz Tas, Ismail Lazoglu, Afsun Sahin^{+}, and Seda Kizilel^{+}. Ruthenium-induced corneal collagen crosslinking under visible light. ***Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting***, 63(7): 2401–A0204, 2022.
6. Cem Kesim*, Mertcan Han*, **Erdost Yıldız***, Houman Bahmani Jalali, Mohammad Haroon Qureshi, Murat Hasanreisoglu, Sedat Nizamoglu^{+}, and Afsun Sahin^{+}. Biocompatibility and neural stimulation capacity of aluminum antimonide nanocrystals biointerfaces for use in

artificial vision. ***Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting***, 62(8):3217–3217, 2021.

7. **Erdost Yıldız**, Muhammad Anwaar Nazeer, Betul Bayraktutar, Noushin Zibandeh, Seda Kizilel, and Afsun Sahin^{+}. Novel corneal crosslinking technique with eosin-y and visible light. ***European Vision and Eye Research (EVER) Congress***, 97, 2019.
8. **Erdost Yıldız**, Ozgun Melik Gedar Totuk, Adriano Mollica, Kerem Kabadayi, and Afsun Sahin^{+}. Effects of μ-opioid receptor agonists on wound healing of corneal epithelium. ***Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting***, 60(9): 3216–3216, 2019.
9. Berna Ozer, **Erdost Yıldız**, and Afsun Sahin^{+}. The effect of estrogen and dihydrotestosterone on hyperosmolarity-induced expression and production of il-1 beta, tnf-alpha and il-8 through mapk pathway in human corneal epithelial cells. ***European Vision and Eye Research (EVER) Congress***, 96:91–92, 2018.
10. **Erdost Yıldız**, Berna Ozer, Ozgun Melike Gedar Totuk, Adriano Mollica, and Afsun Sahin^{+}. Effect of biphalin on corneal epithelial wound healing. ***European Vision and Eye Research (EVER) Congress***, 96:141–141, 2018.

G) PhD Thesis

1. **Erdost Yıldız**. *Retinal and neural stimulation with quantum dots based photovoltaic interfaces*. PhD thesis, **Koç University**, Istanbul, TR, 2021. Open Access Link.

H) Patents

1. *A method and a pharmaceutical composition for visible light-induced corneal crosslinking with ruthenium compounds for the treatment of eye disorders.* S. Kızılel, A. Sahin, A. Yıldız-Tas, M. A. Nazeer, A. Gulzar, & **E. Yildiz**. Application Date: 7 September 2022. Patent No: WO2024054165A1
2. *Janus microparticles having piezoelectric and magnetic properties.* M. Han, **E. Yildiz**, U. Bozuyuk, & M. Sitti. Application Date: 16 February 2024. Patent No: EPO.24158087.7
3. *Sorting method using actively controlled magnetic microparticles.* U. Bozuyuk, A. Karacakol, **E. Yildiz**. Application Date: 18 March 2025. PCT No: PCT/EP2025/057422

I) Invited Talks and Lectures

1. *Microscale Magnetic Robots as Research Tools for Cellular Functions and Interactions*, University of Stuttgart, 5 December 2024
2. *Micro- and Nanorobotics*, Bionic Intelligence for Healthcare Lecture, University of Tübingen, 18 July 2024

3. *Microscale Robotics as a Research Tool for Cellular Biophysics*, Thermo Fisher Discovery and Impact Symposium, University of Oregon, Eugene, 3 May 2024
4. *Introduction to Medical Image Analysis, IMPRS-IS Bootcamp*, Tübingen AI Research Center, University of Tübingen, 15 September 2023

J) Software Licenses

- PEMPS: Automatic Cell Counter and Branch Analyser, 2023
- PHOTODOCTOR: Photodynamic Ocular Drug Delivery System with Optical Coherence Tomography Oriented Microscale Robots, 2022
- Pericyte Counter: Automatic Pericyte Cell Counter in Brain Tissue Slides, 2021
- OCTOPUS: Automatic Foveal Avascular Zone and Perfused Vessel Density Calculator, 2021
- OCRA: Automatic Non-Perfused Choriocapillaris Area Calculator for OCT-A Images, 2021

K) Professional Skills

- **Design and Handling of Animal Experiments (FELASA EU Function A+B+C+D):** Certifications and Experience in Caretaking and Handling of Mice, Rats, Rabbits, Chickens, Pigs, and Zebrafish as Experimental Animal Models
- **In Vivo Electrophysiology Methods:** Local Field Potential (LFP) and Single Unit Electrophysiology, Electroencephalography, Visual Evoked Potential Recordings, Electroretinography
- **Biomedical Imaging Techniques:** In Vivo Confocal Microscopy, Optic Coherence Tomography, Optoacoustic Imaging, Fluorescein Angiography, and Color Fundus Photography in Clinical Settings
- **Animal Behavioral Measurements:** Anxiety, Depression, Object Recognition, and Locomotor Activity Tests; Open Field Test, Dark Light Room, Rotarod, Barnes, and Morris Water Mazes
- **Tissue Processing & Clearing Techniques:** Paraffin & Frozen Sectioning, CLARITY, 3DISCO & iDISCO Clearing Methods
- **Cell Culture Techniques (S1 and S2 Project Leader according to §28 GenTSV):** Primary Neuron, Astrocyte, Microglia, Pericyte, Fibroblast, Epithelia, Myocyte, Macrophage Differentiation, Culturing, and Isolation Methods
- **3D Printing & Tissue Engineering Methods:** SLA & SLS 3D Printing, NanoScribe, 3D Bioprinting, Organ-on-a-chip, Microfluidic Setup Design, and Brain Organoid Production
- **In Vitro Electrophysiology Methods:** Single Ion Channel, Whole Cell, & Tissue Patch-Clamp and Multielectrode Array (MEA) Recordings
- **Cellular and Molecular Imaging:** Immunofluorescence, Immunohistochemistry, Live–Cell Imaging, STED, Confocal, Two-Photon, and Light Sheet Microscopy, Scanning Electron Microscopy
- **Molecular Biology Techniques:** Polymerase Chain Reaction (PCR, qPCR, and RT-PCR), West-

ern Blotting, Flow Cytometry, CRISPR-Cas9, Sequence Alignment Tools (BLAST, Clustal), Lipid Transfection, Viral Transduction, Agarose and SDS-PAGE Gel Electrophoresis, Microarray Analysis, ELISA, and Spectrophotometric Assays

- **Pharmaceutical Analysis Techniques:** High-Performance Liquid Chromatography (HPLC), UV-visible Spectrophotometry, Capillary Electrophoresis (CE), and Fourier Transform Infrared Spectroscopy (FTIR)
- **Nanoparticla Fabrication, Functionalization, and Bioconjugation Methods:** Sol-gel, Microemulsion, and Hydrothermal Syntheses; Physical and Chemical Vapor Deposition, PEGylation, Silanization, and Antibody Bioconjugation Methods, including Click Chemistry, Carbodiimide, and Hydrazide Reactions
- **Material Characterization Methods:** Atomic Force Microscopy, Dynamic Mechanical Analyses with Hybrid Rheometer, Tensile Stress Test, Dynamic Light Scattering (DLS)
- **Programming Languages and Simulation Environments:** Python (NumPy, SciPy, Keras, PyTorch & TensorFlow for Machine Learning & AI applications), MATLAB, COMSOL, SOLIDWORKS, NEURON, R, LaTeX, Git, Arduino, GraphPad Prism, Origin, SPSS, Excel

L) Grants & Fundings Awarded to Date

- **EU Marie Skłodowska-Curie Individual Fellowship** for Photodynamic Ocular Drug Delivery System with Optical Coherence Tomography Oriented Microscale Robots. **Budget: € 180 000**
- **CyberValley Innovation Fellowship by Carl-Zeiss-Stiftung** as CELLnROLL Start-up team for development of microfluidic cancer detection systems. **Budget: € 500 000**
- **MAX!MIZE Start-up Phase 1 Funding** as CELLnROLL Start-up team to build a microrobotic-based biophysical and functional cell analyzer. **Budget: € 50 000 + € 80 000**
- **MPG Diversity Excellence Funding** for MAXMINDS: Mentoring for Inclusion and Diversity in Science Project. **Budget: € 40 000**
- **TÜBİTAK Individual Young Entrepreneurship Grant** for developing a visible light-based corneal crosslinking system. **Budget: approx. € 30 000**

M) Industrial Collaborations

Research & Development Projects

2021 – present	CELLnROLL, Germany	Microrobotic Diagnostic Device Production
2019 – 2021	GlakoLens, Turkey	Noninvasive Intraocular Pressure Tracking
2019 – 2020	Liba Ilac, Turkey	Transcorneal Drug Delivery System
2018 – 2021	Techy Bilisim, Turkey	In Vivo Corneal Microscopy Software

Biomedical Consultancy

2020 – 2023	OIRRC, USA	OCT Image Analysis & Software Development
2018 – 2020	GlaucoT, Turkey	Therapeutic Device for Intraocular Pressure Increase

N) Languages

English – C2 (Proficient), German – B2 (Upper Intermediate), French – A1 (Beginner), Turkish – C2 (Native)

O) Society Involvements

2024 – present	**Ethics, Data Privacy and Security Committee** Implantable Brain-Computer Interface Collaborative Community (iBCI-CC)
2023 – present	**Global Members Committee** The Association for Research in Vision and Ophthalmology (ARVO)
2023 – 2024	**Associated Scientist** International Max Planck Research Schools (IMPRS)
2022 – 2024	**Institutional Postdoc Representative** Max Planck Society Postdoctoral Network
2022 – 2023	**Mentor in Developing Country Eye Researcher Fellowship** The Association for Research in Vision and Ophthalmology (ARVO)

P) Editorial Roles on Scientific Journals

Reviewer: Science Advances, Frontiers in Neuroscience, Progress in Biomedical Engineering, Investigative Ophthalmology and Visual Science (IOVS), Translational Vision Science and Technology (TVST), ACS Applied Nano Materials, Neuro-Ophthalmology.

Q) References

The contact information of references will be given upon a reasonable request.

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- **Prof. Dr. Duygun Erol Barkana** – Professor at Electrical and Electronic Engineering Department, Yeditepe University, Istanbul, Turkey

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- **Prof. Dr. Afsun Sahin** – Head of the Ophthalmology Department, Koc University, Istanbul, Turkey – *PhD Co-advisor*