NIKOS CHRONIS

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Research Interests: Micro/Nano Electromechanical Systems, Micro/Nano Engineering & 3D printing, Point-of care Systems, Microfluidics, Biosensors, Smart Antimicrobial Microsurfaces.
General Interests: Technology Innovation, Translational Research, Spin-offs and Social entrepreneurship, Global Health, Human-Technology Interaction, Industrial Archeology.

EDUCATION

1999-2004 Ph.D., **University of California at Berkeley, USA**
Mechanical Engineering, 09/2004

Title: 'Lab-on-a-Chip Mechanical and Optical Components for the Manipulation and Detection of Biological Samples' (advisor Prof. Luke Lee)

1993-1998 B.E. (Bachelor of Engineering), **Aristotle University of Thessaloniki, Greece**
Mechanical Engineering, Graduated with Honors (1st out of 145 students)

ACADEMIC POSITIONS

9/2022 -	Professor, School of Chemical Engineering, National Technical University of Athens, Greece
2020 - 2022	Associate Professor, Department of Materials Science and Technology, University of Crete, Greece
2012 - 2020	Associate Professor, Mechanical Engineering Department & Biomedical Engineering Department, University of Michigan, Ann Arbor, Michigan, USA
2006 - 2012	Assistant Professor, Mechanical Engineering Department & Biomedical Engineering Department, University of Michigan, Ann Arbor, Michigan, USA
2004 - 2006	Postdoctoral Researcher, Howard Hughes Medical Institute, The Rockefeller University, New York, NY, at the laboratory of Dr. Cornelia Bargmann.
1999 - 2004	Graduate Student Researcher, University of California at Berkeley, Berkeley, CA

HONORS/AWARDS

2022	Defense Innovation Challenge Award (Hellenic Ministry of National Defense)
2021	The NewNow Health Award (Swiss Embassy of Greece)
2017	International Association for Dental Research Award
2011	Mechanical Engineering Department Achievement Award – University of Michigan
2009	NIH Director's New Innovator Award
1999-2003	Korgialenio Foundation Fellowship (Greece)
1999	Fulbright Foundation Fellowship, (rejected by the candidate)
1998	Technical Chamber of Greece Award for ranked first among 145 Students
1996	National Scholarships Foundation Award for Outstanding Academic Performance
1996	Technical Chamber of Greece Award for Outstanding Academic Performance

TEACHING EXPERIENCE

Undergraduate Courses

Fluid Mechanics, Lab Instrumentation, Design and Manufacturing, Introduction to Technical Drawing, Introduction to Biomedical Engineering, Bioengineering.

Graduate Courses

Introduction to MicroElectroMechanical Systems (MEMS), Introduction to BioMEMS and Microfluidics.

JOURNAL PUBLICATIONS (selected publications)

1. Chaudhury AR., Bazopoulou D., **Chronis N.** 'The Worm Immobilization Plate (WIP): A novel tool for fast and reversible immobilization of *C. elegans* populations on an agar substrate', Lab Chip (*accepted with revisions*).
2. Pundir M., Papagerakis S., De Rosa M., **Chronis N**., Kurabayashi K., Abdulmawjood S., Prince M., Lobanova L. , Chen X., Papagerakis P., 'Emerging biotechnologies for evaluating disruption of stress, sleep, and circadian rhythm mechanism using aptamer-based detection of salivary biomarkers', *Biotechnol Adv. 2022* Apr 13;59:107961, doi: 10.1016/j.biotechadv.2022.107961.
3. Chaudhurya A.R, Korompili G., Mitra M., **Chronis N.** 'A 3D-printed, touch-activated, sanitizer dispensing device for reducing healthcare-acquired infections', *Journal of 3D Printing in Medicine*, VOL. 4, NO. 2, October 2020.
4. Korompili, G., Missiakos K., **Chronis, N.** 'An optoelectronic chip with integrated epi-illumination source and collection optics for imaging applications', *Sensors and Actuators A: Physical*, Volume 312, September 2020.
5. Korompili, G., Kanakaris, G., Ampatis, C., **Chronis, N**., 'A portable, optical scanning microsystem for large field of view, high resolution imaging of biological specimens', *Sensors and Actuators A-physical*, Volume: 279 Pages: 367-375 Published: AUG 15 2018
6. Bazopoulou D., Chaudhury AR; Pantazis A., **Chronis N.,** 'An automated compound screening for anti-aging effects on the function of C. elegans sensory neurons', *Scientific Reports* 7, Article number: 9403 (2017), doi:10.1038/s41598-017-09651-x.
7. Chaudhury, A., Insolera, R.; Hwang RD., Fridell, YW., Collins, C., **Chronis, N**., 'On chip cryo-anesthesia of Drosophila larvae for high resolution *in vivo* imaging applications', *LAB ON A CHIP* Volume: 17 Issue: 13 Pages: 2303-2322 Published: JUL 7 2017.
8. Gourgou E. and **Chronis N**. 'Chemically induced oxidative stress affects ASH neuronal function and behavior in C. elegans', *Scientific Reports 6*, Article number: 38147 (2016).
9. Chaudhury A., Pantazis A.K., **Chronis N**., 'An Image Contrast-Based Pressure Sensor', Sensors & Actuators: A. Physical Sensors and Actuators A: Physical, Volume 245, 1 July 2016, Pages 63–67
10. Leinwand, S.G., Yang, C.J., Bazopoulou, D., **Chronis**, N., Srinivasan, J., & Chalasani, S.H. (2015). Circuit mechanisms encoding odors and driving aging-associated behavioral declines in Caenorhabditis elegans. eLife, 4, e10181. http://doi.org/10.7554/eLife.10181
11. Hadjiiski L., Marentis T.C., Chaudhury A.R., Rondon L., **Chronis N**. and Chan HP, 'Computer aided detection of surgical retained foreign object for prevention', *Medical Physics* 42, 1213 (2015).
12. Gulari M.N., Tripathi A., Ghannad-Rezaie M. and **Chronis N**., 'An Optofluidic Lens Array Microchip for High Resolution Stereo Microscopy', Micromachines 2014, 5(3), 607-621.
13. Tripathi A., Riddell J., and **Chronis N**., 'A Biochip with a 3D microfluidic architecture for trapping white blood cells', *Sensors and Actuators B-chemical*, Volume: 186, September 2013, p. 244-251.
14. Ghannad-Rezaie M., Wang X., Mishra B., Collins C. and **Chronis N**. 'Microfluidic chips for *in vivo* imaging of cellular responses to neural injury in Drosophila larvae', *PLoS One.* 2012;7(1):e29869. Epub 2012 Jan 23.
15. Ghannad-Rezaie M., Yang L., Garton H. and **Chronis N**. 'A Near Infrared Opto-mechanical Intracranial Pressure Microsensor', *Journal of Microelectromechanical Systems*, Vol. 21, No. 1, February 2012, p. 23-33.
16. Tripathi A. and **Chronis N**., 'A doublet microlens array for imaging micron-sized objects', *J. Micromech. Microeng*. Vol. 21, Number 10, doi:10.1088/0960-1317/21/10/105024 (2011).

17. Chokshi T.V., Bazopoulou D. and **Chronis N**., 'Probing the physiology of ASH neuron in Caenorhabditis elegans using Electric Current Stimulation', *Applied Physics Letters* 99, 053702 (2011).
18. Chokshi T.V., Bazopoulou D. and **Chronis N., '**An automated microfluidic platform for calcium imaging of chemosensory neurons in Caenorhabditis elegans'**,** *Lab Chip*. 10(20):2758-63 (2010).
19. **Chronis N., '**Worm Chips: Microtools for *C. elegans* Biology', *Lab Chip*, 2010, 10, 432 – 437.
20. Ben-Yakar A., **Chronis N**. and Lu H., 'Microfluidics for the analysis of behavior, nerve regeneration, and neural cell biology in worms', *Current Opinion in Neurobiology,* Oct;19(5):561-7 (2009).
21. Tripathi A., Chokshi T.V., **Chronis N**., 'A high numerical aperture, polymer-based, planar microlens array', *Optics Express*, Vol. 17 Issue 22, pp.19908-19918 (2009).
22. Choskshi T.V., Ben–Yakar A. and **Chronis N.,** 'CO_2 and Compressive Immobilization of *C. elegans* on-chip**'**, *Lab Chip*, 2009, 9, 151 – 157.
23. Guo S.X., Frederic Bourgeois F., Chokshi T., Durr N.J., Hilliard M.A., **Chronis N.** & Ben-Yakar A., 'Femtosecond laser nanoaxotomy lab-on-a-chip for in vivo nerve regeneration studies', *Nature Methods*, vol. 5 no 6., 531 - 533 (2008).
24. Chalasani S., **Chronis N**., Tsunozaki M., Gray J., Goodman M., Bargmann C., 'Dissecting a neural circuit for food-seeking behavior in Caenorhabditis elegans', *Nature* 450, 63-70 (2007).
25. **Chronis N.,** Zimmer M., and Bargmann C.I., 'Microfluidics for *in vivo* imaging neuronal and behavioral activity in Caenorhabditis elegans*, Nature Methods',* vol.4 no.9, September 2007, p. 727-731*.*
26. **Chronis N.** and Lee L.P, "Electrothermally activated SU-8 Microgripper for Single Cell Manipulation", *Journal of MicroelectroMechanical Systems,* 2005*,* Volume 14, Issue 4, p.857- 863.
27. Jeong K.H., Liu G.L, **Chronis N.** and Lee L.P. "Tunable Microdoublet Lens Array", *Optics Express*, Volume 12, May 2004, p. 2494-2500.
28. **Chronis N.** and Lee L.P, "Total-Internal Reflection based-Biochip utilizing a polymer-filled cavity with a micromirror sidewall", *Lab Chip*, 2004, 4, p.125 – 130.

PEER-REVIEWED CONFERENCE PUBLICATIONS (selected publications)

1. Barmpakos D., Kritikou S., Tsakris A., Vrioni G. and **Chronis N**. 'A heat-activated antimicrobial microfilm for eliminating pathogen transmission in high touch surfaces', The 27th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS), 15-19 October 2023, Katowice, Poland.
2. Ni L., Wang X., **Chronis N.** and Xu G., 'Monitoring acute subdural hematoma in real-time with near infrared diffuse optical tomography: a feasibility study', *SPIE Photonics West 2020*, San Francisco (USA), 1 - 6 February 2020.
3. Korompili G., Kanakaris G., Ampatis C. and **Chronis N**., 'A Portable, Optical Scanning System for Large Field of View, High Resolution Imaging of Biological Specimens,' *Eurosensors 2017* Conference, Paris, France, 3–6 September 2017.
4. K. Misiakos, I. Raptis, A. Salapatas, M. Anastasopoulou, A. Malainou, **N. Chronis** and G. Jobst, **"**Monolithic Silicon Optical Microchips for Broad-Band Mach-Zehnder Interferometry and Highly Sensitive Label Free Immunosensing**,"** *Bio-MEMS and Medical Microdevices II Conference*, Barcelona, , Spain, vol. 9518, May 2015, DOI: 10.1117/12.2179355.
5. Anastasopoulou M., Malainou A., Salapatas A., **Chronis N.,** Papagerakis S., Jobst G., Raptis I. and Misiakos K., 'An interferometric integrated microsystem for the label free detection of interleukins', The 18th *International Conference on Miniaturized Systems for Chemistry and Life Sciences (*μTAS), St. Luis, USA, October 2014.
6. C.R. Oliver, E. Gourgou, D. Bazopoulou, **N. Chronis** and A.J. Hart, 'Platform for In-Vitro Photo-Patterning of Whole Animal C. Elegans Assays and Behavior Control', *18th International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2014*, San Antonio, TX, pp. 2558-2559, October 2014.

7. Pantazis A.K., Papagerakis S., Papagerakis P. and **Chronis N**., 'An optofluidic chip for studying mechanical deformation of cells', The 18th *International Conference on Miniaturized Systems for Chemistry and Life Sciences (*µTAS), St. Luis, USA, October 2014.
8. Marentis T.C., Hadjiiski L., Chaudhury, A.R., Rondon, L., Chronis, N., Chan, H.P., 'Surgical Retained Foreign Object (RFO) Prevention by Computer Aided Detection (CAD)', *SPIE Conference on Medical Imaging - Computer-Aided Diagnosis,* San Diego, February 18-20, 2014.
9. Gulari M.N., Ghannad-Rezaie M., and **Chronis N**., 'A Compact, Optofluidic System For Measuring Red Blood Cell Concentration,' *(Transducers) IEEE International Conference on Solid-State Sensors and Actuators*, Barcelona, Spain, pp. 2552-2555, June 2013.
10. Ghannad-Rezaie M., Gulari M.N., Franco R.D.M., Shahzad M., and **Chronis N**., 'A Powerless Optical Microsensor For Monitoring Intraocular Pressure In Keratoprosthetic Implants,' (*Transducers) IEEE International Conference on Solid-State Sensors and Actuators*, Barcelona, Spain, June 2013.
11. Gulari M.N., Ghannad-Rezaie M., Novelli P., **Chronis N.** and Marentis T.C., " An X-Ray Detectable Pressure Microsensor for Monitoring Coronary In-stent Restenosis," *IEEE International Conference on Micro Electro Mechanical Systems (MEMS),* January 2014, San Francisco, CA, p. 893 - 896.
12. Ghannad-Rezaie M., Gulari M.N., and **Chronis N.**, "A Powerless, Fabry-Perot Laser-based Pressure Microsensor," *IEEE-EMBS Micro- and Nanoengineering in Medicine Conference*, Ka'anapali, HI, December 2012.
13. Gulari M.N., Tripathi A., and **Chronis N**., "Microfluidic-Based Oil Immersion Lens for High Resolution Microscopy," The 16th *International Conference on Miniaturized Systems for Chemistry and Life Sciences (*µTAS), Okinawa, Japan, pp. 49-51, October 2012.
14. A. Tripathi, T. C. Marentis, and N. Chronis, 'Microfrabricated instrument tag for the radiographic detection of retained foreign bodies during surgery', *Proceedings of the SPIE, Volume 8313, pp. 83134H-83134H-8 (2012).*
15. A. Tripathi, N. Chronis, "A doublet microlens array for imaging of biological micron-size objects", *The 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences µTAS, 2011*.
16. T.V. Chokshi, D. Bazopoulou, **N. Chronis**, "An automated microfluidic platform for electrical stimulation of the nervous system of C. elegans", *The 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences µTAS, 2011*.
17. M. Ghannad-Rezaie, B. Mishra, C. Collins, **N. Chronis**, "A microfluidic chip for immobilizing and in vivo imaging of *Drosophila* larva", *The 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences µTAS, 2011*.
18. A. Tripathi, **N. Chronis**, "A white blood cell capturing biochip using a 3D trapping architecture", *ASME Summer Bioengineering Conference 2011*.
19. Tripathi A., Chokshi T.V. and **Chronis N.** "Worm-on-chip technology for studying aging of the nervous system in *C. elegans*", *12th International Conference on Micro Total Analysis Systems (µTAS*), San Diego, USA, 12-16 October 2008, p. 1033-1035.
20. Kodandaramaiah S. and **Chronis N.** "An opto-fluidic sensor for monitoring intracranial pressure", *12th International Conference on Micro Total Analysis Systems (µTAS*), San Diego, USA, 12-16 October 2008, p. 1749-1751.
21. **Chronis N.** and Lee L.P. "A polymer-based microrobotic workstation for single cell manipulation", 8*th International Conference on Micro Total Analysis Systems (µTAS*), Malmö, Sweden, 26-30 September 2004, p. 407-409.
22. **Chronis N.** and Lee L.P. "Polymer MEMS-Based Microgripper for Single Cell Manipulation", *17th IEEE International Conference on Micro Electro Mechanical Systems*, Maastricht, 25-29 January 2004, p.17-20.
23. Jeong KH, Gang L. Liu, **Chronis N.** and Lee L.P. "Tunable Microboublet Lens Array", *17th IEEE International Conference on Micro Electro Mechanical Systems*, Maastricht, 25-29 January 2004, p.37-40.

24. **Chronis, N.** and Lee L.P. “Total Internal Reflection-based Biochip for High Throughput Bioassays”, *7th International Conference on Micro Total Analysis Systems (μTAS)*, Squaw Valley, California, 5-9 October 2003, p.1323-6.
25. **Chronis N**. and Lee L.P. “Polymer-based Actuators Integrated Into Microfluidic Systems”, *6th International Conference on Micro Total Analysis Systems (μTAS)*, Nara, Japan, 3-7 November 2002, p.754-7.

RESEARCH GRANTS (indicative research grants)

Project Title	Funding source	Period	Role of the PI
ThermoSkin: A novel self-sterilizing surface for fighting Community and Hospital Acquired infections	ELIDEK (National)	2022-2024	Lead PI
Intra-oral device to measure melatonin saliva hourly levels in patients from sleep disorders	National Institute of Health (USA)	2017-2020	Lead PI
A human-powered, Self-sterilizing, Artificial Skin’	Bodosaki Foundation (National)	2017-2019	Lead PI
A lab-on-chip platform for blood cell counting and identification at the point-of-care	ERC Proof of Concept Grant (EU)	2017-2019	Lead PI
A lab-on-chip platform for blood cell counting and identification at the point-of-care	ERC Starting Grant (EU)	2012-2015	Lead PI
A Fluorescence-based Optomechanical Sensor for Intraocular Pressure Monitoring	National Institute of Health (USA)	2010-2012	Lead PI

PATENTS

- 'OPTICAL MICROSENSOR AND METHODS FOR MONITORING INTRACRANIAL PRESSURE' (US Patent, US20100094164)
- 'COMPACT LENS ARRAY SYSTEM' (US Patent, US20140268319)
- 'RETAINED OBJECT TAG AND DETECTION METHOD' (US Patent, US20150018671)
- 'LIQUID ACTIVATED DEVICES AND SYSTEMS' (US Patent, 62/633,96)
- 'MULTI-ENCLOSURE SPECIMEN COLLECTOR AND THERAPEUTIC AGENT DISPENSING SYSTEMS AND DEVICES' (filed on 11/2019)

SERVICE to the Community

- External Reviewer for the Greek National Minister of Research and Technology
- External Reviewer for the National Science Foundation (USA)
- Technical Reviewer for the 34th International Conference on Micro and Nano Engineering
- Technical Reviewer for the 35th International Conference on Micro and Nano Engineering
- Technical Reviewer for the 36th International Conference on Micro and Nano Engineering
- Technical Reviewer for the 37th International Conference on Micro and Nano Engineering
- Technical Reviewer for professional journals (Nature Methods, Optics Express, Applied physics, Journal of Microelectromechanical Systems, Journal of Micromechanics and Microengineering, Lab-on-chip, Analytica Chimica Acta, Journal of Visualized Experiments, Sensors and Actuators)
- Consultation services for recruiting new faculty at KAUST University