

CURRICULUM VITAE

Hadar Ben-Yoav, Ph.D.

Ben-Gurion University of the Negev
Department of Biomedical Engineering,
P.O.B 653 Beer-Sheva
8410501, Israel

Mobile Phone: +972 (0)53-2225342
Building 64, Room 204
E-mail: benyoav@bgu.ac.il
Website: <http://nanobioelectronics.weebly.com/>

EDUCATION

- 2006 – 2010 **Ph.D., Electrical Engineering**
Tel Aviv University, Israel
Thesis: “Electrochemical whole-cell low profile bio-chips”
Advisors: [Professor Yosi Shacham-Diamand](#) and [Professor Amihay Freeman](#)
- 2004 – 2006 **M.Sc. (cum laude), Biotechnology**
Tel Aviv University, Israel
Thesis: “Antimicrobial activity of silver-glucose oxidase hybrid”
Advisor: [Professor Amihay Freeman](#)
- 2001 – 2004 **B.Sc., Multidisciplinary program in Physics and Biological Sciences**
Tel Aviv University, Israel

ACADEMIC AND PROFESSIONAL EXPERIENCE

- 2015 – Present **Senior Lecturer (Assistant Professor)**
Department of Biomedical Engineering, Ben-Gurion University of the Negev, Israel
- 2011 – 2015 **Post-Doctoral Research Associate**
Department of Electrical and Computer Engineering, Institute for Systems Research, University of Maryland, College Park, MD, United States
Mentor: [Professor Reza Ghodssi](#)
- 2010 – 2011 **Research Associate**
“Printed Electronics” project manager, RAMOT at Tel Aviv University LTD., Israel
- 2002 – 2004 **Research Assistant**
Nanoscience and Nanotechnology Center, Tel Aviv University, Israel
- 2004 – 2005 **Research Assistant**
fMRI Research Center, Ichilov Hospital, Israel

ACHIEVEMENTS [ref. from LOP]

- 1st demonstration of a microfabricated **lab-on-a-chip device for schizophrenia antipsychotic drug treatment monitoring** at the point-of-care [3, 5, 9, 12]
- Utilization of a multi-sensor array approach integrated with pattern recognition methods for “**smart**” **analysis of complex biological signals in organs** [6-7]
- 1st report of diffusion-based biosensing approach for **DNA hybridization detection in micro-environments** [10-11, 16]

- Investigation of dominant mass transfer and electrochemical reactions at **the interface of biological and microelectronic systems** ^[14, 23]
- Integration of electrical fields for the **manipulation of microbial cells** ^[2, 20, 25]
- Demonstration of **new families of electrochemical and optical whole-cell biochips** for rapid and sensitive field monitoring of water toxicity ^[17, 19, 21, 27, 29-32]

ACADEMIC AND PROFESSIONAL AWARDS

- 2010 **Katzir travel award for outstanding Ph.D. students**, Weizmann Institute of Science, Israel
- 2009 **The Miriam and Aaron Gutwirth scholarship for outstanding Ph.D. students**. Tel Aviv University, Israel
- 2008 **2nd best poster award** at the *7th International Symposium on Electrochemical Micro & Nanosystem Technologies 2008 Conference*, September, 2008, Ein-Gedi, Israel
- 2008 **Trotzki Award for Ph.D. students**. Tel Aviv University, Israel
- 2004 **Dean's list 3rd Year Undergraduate Student Award**. Tel Aviv University, Israel

PUBLICATIONS

A. Chapters in Books

1. **Ben-Yoav, H.**, Cohen-Hadar, N., and Freeman, A. [Biomedical implications of the porosity of microbial biofilms](#). In: *Porous Media: Applications in Biological Systems and Biotechnology*. Ed. Vafai K., Taylor & Francis Group, pp. 121-171, 2010.

B. Articles in Refereed Journals

B.1. Published

1. Meyer, M. T., Subramanian, S., Kim, Y. W., **Ben-Yoav, H.**, Gnerlich, M., Gerasopoulos, K., Bentley, W. E., and Ghodssi, R. [Multi-depth valved microfluidics for biofilm segmentation](#). *Journal of Micromechanics and Microengineering* 25, pp. 095003, 2015.
2. Kim, Y.W., Subramanian, S., Gerasopoulos, K., **Ben-Yoav, H.**, Wu, H.-C., Quan, D., Carter, K., Meyer, M.T., Bentley, W.E., Ghodssi, R. [Effect of electrical energy on the efficacy of biofilm treatment using the bioelectric effect](#). *npj Biofilms and Microbiomes*, 15016, 2015.
3. Kelly, D. L., **Ben-Yoav, H.**, Payne, G. F., Winkler, T. E., Chocron, S. E., Kim, E., Stock, V., Vyas, G., Love, R. C., Wehring, H. J., Sullivan, K. M., Feldman, S., Liu, F., McMahon, R. P., and Ghodssi, R. [Blood draw barriers for treatment with clozapine and development of point-of-care monitoring device](#). *Clinical Schizophrenia & Related Psychoses*, 2015 (In Press).
4. Gnerlich, M., **Ben-Yoav, H.**, Culver, J. N., Ketchum, D. R., and Ghodssi, R. [Selective deposition of nanostructured ruthenium oxide using Tobacco mosaic virus for micro-supercapacitors in solid Nafion electrolyte](#). *Journal of Power Sources* 293, pp. 649-656, 2015.
5. **Ben-Yoav, H.**, Chocron, S. E., Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. [An electrochemical micro-system for clozapine antipsychotic treatment monitoring](#). *Electrochimica Acta* 163, pp. 260-270, 2015.
6. Kim, E., Chocron, S. E., **Ben-Yoav, H.**, Winkler, T. E., Liu, Y., Glassman, M., Wolfram, C., Kelly, D. L., Ghodssi, R., and Payne, G. F. [Programmable "semismart" sensor: relevance to monitoring antipsychotics](#). *Advanced Functional Materials*, 2015 (Published Online).
7. Chocron, S. E., Weisberger, B. M., **Ben-Yoav, H.**, Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. [Multidimensional mapping method using an arrayed sensing system for cross-reactivity screening](#). *PLoS ONE* 10, pp. e0116310, 2015.
8. Kim, E., Xiong, Y., Cheng, Y., Wu, H.-C., Liu, Y., Morrow, B., **Ben-Yoav, H.**, Ghodssi, R., Rubloff, G., Shen, J., Bentley, W., Shi, X., and Payne, G. [Chitosan to connect biology to electronics: fabricating the bio-device interface and communicating across this interface](#). *Polymers special issue on "Chitin and Chitosans"* 7, pp. 1-46, 2015.

9. Winkler, T. E., **Ben-Yoav, H.**, Chocron, S. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. [Electrochemical study of the catechol-modified chitosan system for clozapine treatment monitoring](#). *Langmuir* 30, pp. 14686-14693, 2014.
10. **Ben-Yoav, H.**, Dykstra, P. H., Bentley, W. E., and Ghodssi, R. [A controlled microfluidic electrochemical lab-on-a-chip for label-free diffusion-restricted DNA hybridization analysis](#). *Biosensors and Bioelectronics* 64, pp. 579-585, 2015.
11. **Ben-Yoav, H.**, Dykstra, P. H., Gordonov, T., Bentley, W. E., and Ghodssi, R. [A microfluidic-based electrochemical biochip for label-free DNA hybridization analysis](#). *Journal of Visualized Experiments* 91, e51797, 2014.
12. **Ben-Yoav, H.**, Winkler, T. E., Kim, E., Chocron, S. E., Kelly, D. L., Payne, G. F., and Ghodssi, R. [Redox cycling-based amplifying electrochemical sensor for *in situ* clozapine antipsychotic treatment monitoring](#). *Electrochimica Acta* 130, pp. 497-503, 2014.
13. Gordonov, T., Kim, E., Cheng, Y., **Ben-Yoav, H.**, Ghodssi, R., Rubloff, G., Yin, J.-J., Payne, G. F., and Bentley, W. E. [Electronic modulation of biochemical signal generation](#). *Nature Nanotechnology* 9, pp. 605-610, 2014.
14. **Ben-Yoav, H.**, Biran, A., Sternheim, M., Belkin, S., Freeman, A., and Shacham-Diamand, Y. [Functional modeling of electrochemical whole-cell biosensors](#). *Sensors and Actuators B: Chemical* 181, pp. 479-485, 2013.
15. Ofek Almog, R., **Ben-Yoav, H.**, Sverdlov, Y., Shmilovich, T., Krylov, S., and Shacham-Diamand, Y. [Integrated polypyrrole flexible conductors for biochips and MEMS applications](#). *Journal of Atomic, Molecular, and Optical Physics* vol. 2012, Article ID 850482, 2012.
16. **Ben-Yoav, H.**, Dykstra, P. H., Bentley, W. E., and Ghodssi, R. [A microfluidic-based electrochemical biochip for label-free diffusion-restricted DNA hybridization analysis](#). *Biosensors and Bioelectronics* 38 (1), pp. 114-120, 2012.
17. **Ben-Yoav, H.**, Ofek Almog, R., Sverdlov, Y., Sternheim, M., Belkin, S., Freeman, A., and Shacham-Diamand, Y. [Modified working electrodes for electrochemical whole-cell microchips](#). *Electrochimica Acta* 82 (1), pp. 109-114, 2012.
18. Cristea, D. G., Basch, M. E., **Ben-Yoav, H.**, Tiponut, V., and Shacham-Diamand, Y. [Universal signal conditioning system for amperometric sensors](#). *Advances in Electrical and Computer Engineering* 12 (1), pp. 19-24, 2012.
19. **Ben-Yoav, H.**, Amzel, T., Biran, A., Sternheim, M., Belkin, S., Freeman, A., and Shacham-Diamand, Y. [Bacterial biofilm-based water toxicity sensor](#). *Sensors and Actuators B: Chemical* 158 (1), pp. 366-371, 2011.
20. **Ben-Yoav, H.**, Amzel, T., Sternheim, M., Belkin, S., Rubin, A., Shacham-Diamand, Y., and Freeman, A. [Signal amelioration of electrophoretically deposited whole-cell biosensors using external electric fields](#). *Electrochimica Acta* 56 (26), pp. 9666-9672, 2011.
21. Biran, A., **Ben-Yoav, H.**, Yagur-Kroll, S., Pedahzur, R., Buchinger, S., Shacham-Diamand, Y., Reifferscheid, G., and Belkin, S. [Microbial genotoxicity bioreporters based on *sulA* activation](#). *Analytical and Bioanalytical Chemistry* 400 (9), pp. 3013-3024, 2011.
22. **Ben-Yoav, H.**, Melamed, S., Freeman, A., Shacham-Diamand, Y., and Belkin, S. [Whole cell biochips for bio-sensing: integration of live cells and inanimate surfaces](#). *Critical Reviews in Biotechnology* 31(4), pp. 337-353, 2011.
23. **Ben-Yoav, H.**, Freeman, A., Sternheim, M., and Shacham-Diamand, Y. [An electrochemical impedance model for integrated bacterial biofilms](#). *Electrochimica Acta* 56, pp. 7780-7786, 2011.
24. Biran, A., Yagur-Kroll, S., Pedahzur, R., Buchinger, S., Reifferscheid, G., **Ben-Yoav, H.**, Shacham-Diamand, Y., and Belkin, S. [Bacterial genotoxicity bioreporters](#). *Microbial Biotechnology* 3(4), pp. 412-427, 2010.
25. **Ben-Yoav, H.**, Freeman, A., Sternheim, M., Fishelson, N., Rubin, A., Biran, A., Pedahzur, S., Belkin, S., and Shacham-Diamand, Y. [Electronically directed integration of whole-cell biosensors on bio-chips](#). *ECS Transactions* 33(8), pp. 49-58, 2010.
26. Shacham-Diamand, Y., Belkin, S., Rishpon, J., Elad, T., Melamed, S., Biran, A., Yagur-Kroll, S., Almog, R., Daniel, R., **Ben-Yoav, H.**, Rabner, A., Vernick, S., Elman, N., and Popovtzer, R. [Optical and electrical interfacing technologies for living cell bio-chips](#). *Current Pharmaceutical Biotechnology* 11(4), pp. 376-383, 2010.

27. Buchinger, S., Grill, P., Morosow, V., **Ben-Yoav, H.**, Shacham-Diamand, Y., Biran, A., Pedahzur, R., Belkin, S., and Reifferscheid, G. [Evaluation of chrono-amperometric signal detection for the analysis of genotoxicity by a whole cell biosensor](#). *Analytica Chimica Acta* 659, pp. 122-128, 2010.
28. Almog, R., Daniel, R., Vernick, S., Ron, A., **Ben-Yoav, H.**, and Shacham-Diamand, Y. [On-chip detection of cellular activity](#). *Advances in Biochemical Engineering/Biotechnology* 117, pp. 179-191, 2010.
29. **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., and Shacham-Diamand, Y. [A whole cell electrochemical biosensor for water genotoxicity bio-detection](#). *Electrochimica Acta EMNT 2008 special issue* 54(25), pp. 6113-6118, 2009.
30. **Ben-Yoav, H.**, Elad, T., Shlomovits, O., Belkin, S., and Shacham-Diamand, Y. [Optical modeling of bioluminescence in whole cell biosensors](#). *Biosensors and Bioelectronics* 24(7), pp. 1969-1973, 2009.
31. **Ben-Yoav, H.**, Shacham-Diamand, Y., Freeman, A., Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., and Reifferscheid, G. [A novel microfluidic whole cell biosensor based on electrochemical detection for water toxicity analysis](#). *ECS Transactions* 16(11), pp. 187-197, 2008.
32. Elman, N. M., **Ben-Yoav, H.**, Sternheim, M., Rosen, R., Krylov, S., and Shacham-Diamand, Y. [Towards toxicity detection using a lab-on-chip based on the integration of MOEMS and whole-cell sensors](#). *Biosensors and Bioelectronics* 23, pp. 1631-1636, 2008.
33. **Ben-Yoav, H.** and Freeman, A. [Enzymatically attenuated *in situ* release of silver ions to combat bacterial biofilms: a feasibility study](#). *Journal of Drug Delivery and Science Technology* 18(1), pp. 25-29, 2008.

B.2. Submitted

1. Winkler, T. E., **Ben-Yoav, H.**, and Ghodssi, R. [Hydrodynamic focusing for microfluidic impedance cytometry: a system integration study](#). *Analytical Chemistry*, Submitted on August 2015.
2. Gnerlich, M., **Ben-Yoav, H.**, Culver, J. N., Ketchum, D. R., and Ghodssi, R. [Nanostructured RuO₂ using Tobacco mosaic virus template for micro-supercapacitors](#). *Journal of Power Sources*, Submitted on Mar 2015.

C. Papers Presented in Refereed Conference Proceedings

1. **Winkler, T. E., Ben-Yoav, H., Kelly, D. L., and Ghodssi, R.** [Osmotic erythrocyte lysis for chemical- and label-free impedance cytometry](#). *Proceedings of the 18th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers '15), June, 2015, Anchorage, Alaska, United States*, pp. 351-354.
2. **Winkler, T. E., Ben-Yoav, H., Kelly, D. L., and Ghodssi, R.** [Microsystem for particle counting and sizing with tunable sensitivity and throughput](#). *Proceedings of the 2014 Hilton Head Solid-State Sensors, Actuators and Microsystems Workshop, June, 2014, Hilton Head, South Carolina, United States*, pp. 251-254.
3. **Ben-Yoav, H., Winkler, T. E., Chocron, S. E., Costa, G. R., Restaino, S. M., Woolsey, N., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R.** [Towards personalized mental healthcare: an electrochemically-amplified biosensor for clozapine antipsychotic treatment monitoring](#). *17th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2013), October, 2013, Freiburg, Germany*, pp. 1167-1169.
4. **Ben-Yoav, H., Winkler, T. E., Chocron, S. E., Restaino, S. M., Costa, G. R., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R.** [Bio-amplifying lab-on-a-chip for antipsychotic clozapine treatment monitoring](#). *Proceedings of the 17th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers '13), June, 2013, Barcelona, Spain*, pp. 317-320.
5. **Ben-Yoav, H., Chocron, S. E., Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R.** [The effect of vitamin C in point-of-care blood analysis using an electrochemical biosensor](#). *IEEE Sensors 2013, November, 2013, Baltimore, Maryland, United States*, pp. 141-144.
6. **Zhang, F., Fan, X. Z., Gerasopoulos, K. D., Ben-Yoav, H., Brown, A. D., Culver, J. N., and Ghodssi, R.** [Scale-down effects: towards miniaturization of an electrochemical sensor using biomolecules](#). *IEEE Sensors 2013, November, 2013, Baltimore, Maryland, United States*, pp. 1408-1411.
7. **Ben-Yoav, H., Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R.** [Catechol-modified chitosan system as a bio-amplifier for schizophrenia treatment analysis](#). *Proceedings of the 2013 MRS Spring Meeting 2013, April, 2013, San Francisco, California, United States*.
8. **Ben-Yoav, H., Brown, A. D., Pomerantseva, E., Kelly, D. L., Culver, J. N., and Ghodssi, R.** [Tobacco mosaic virus biotemplated electrochemical biosensor](#). *Proceedings of the 2012 Hilton Head Solid-State Sensors, Actuators and Microsystems Workshop, June, 2012, Hilton Head, South Carolina, United States*, pp. 193-196.

9. [Kim, Y. W., Mosteller, M. P., Meyer, M. T., Ben-Yoav, H., Bentley, W. E., and Ghodssi, R. Microfluidic biofilm observation, analysis and treatment \(Micro-BOAT\) platform. *Proceedings of the 2012 Hilton Head Solid-State Sensors, Actuators and Microsystems Workshop, June, 2012, Hilton Head, South Carolina, United States*, pp. 233-236.](#)
10. [Cristea, D.-G., Ben-Yoav, H., Shacham-Diamand, Y., Basch, M.-E., Tiponut, V., and Haraszy, Z. VLSI universal signal conditioning circuit for electrochemical and bioluminescent sensors. *2010 IEEE 26-th Convention of Electrical and Electronics Engineers in Israel, November, 2010, Eilat, Israel*, pp. 249-252.](#)
11. [Ben-Yoav, H., Yorish, S., Elad, T., Vernick, S., Belkin, S. and Shacham-Diamand, Y. A novel micro-fluidic whole cell biosensor for water toxicity analysis using bioluminescence detection. *Proceedings of MicroTAS 07 v2, October, 2007, Paris, France*, pp. 1049-1052.](#)

GRANTS

A. Funded Grants

- *The Maryland Innovation Initiative (MII) grant –*
 - *Title: “Biosensor Device for Clozapine Treatment Monitoring in Schizophrenia”*
 - August 2013- April 2014. Prof. R. Ghodssi (PI), Prof. G. F. Payne (Co-PI), and Dr. **H. Ben-Yoav (Co-PI)** from University of Maryland, College Park, Prof. D. L. Kelly (Co-PI) from University of Maryland School of Medicine in Baltimore. \$125k.
- *National Institutes of Health (NIH) R56 Bridge Research Grant –*
 - *Title: “Microsystem Development for Clozapine Monitoring in Schizophrenia”*
 - February 2015 – January 2017. Prof. R. Ghodssi (PI) and Prof. G. F. Payne (Co-PI) from University of Maryland, College Park, Prof. D. L. Kelly (PI) from University of Maryland School of Medicine in Baltimore. \$1.252M.
 - **Directed and participated** in the motivation and concept development and writing of the research grant.

CONFERENCE PRESENTATIONS

A. Invited Talks

- **Ben-Yoav, H.** [Electrochemical biosensors for point-of-care monitoring in mental health](#). *2015 Israel Electrochemistry Annual Meeting*, October, 2015, Beer Sheva, Israel.
- **Ben-Yoav, H.**, Winkler, T. E., Chocron, S. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. [Micro-systems for point-of-care monitoring in mental health](#). *Mid-Atlantic Micro/Nano Alliance Spring 2014 Symposium*, March, 2014, Baltimore, Maryland, United States.
- **Ben-Yoav, H.**, Kelly, D. E., Payne, G. F., and Ghodssi, R. [Closing the loop between clinicians and patients in mental health](#). *2013 Bioscience Research & Technology Review Day*, November, 2013, College Park, Maryland, United States.

B. Presentations

- [Winkler, T. E., Ben-Yoav, H., Kelly, D. L., and Ghodssi, R. Osmotic erythrocyte lysis for chemical- and label-free impedance cytometry](#). Oral paper presented at the *18th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers '15)*, June, 2015, Anchorage, Alaska, United States.
- [Chocron, S. E., Ben-Yoav, H., Kelly, D. L., and Ghodssi, R. Chemometric modeling for sensing in serum matrices: accounting for population variability](#). Poster presented at the *Biomedical Engineering Society/FDA Frontiers in Medical Devices Conference*, May, 2015, Washington DC, United States.
- [Winkler, T. E., Ben-Yoav, H., Kelly, D. L., and Ghodssi, R. Flow focusing for microfluidic impedance cytometry](#). Poster presented at the *Biomedical Engineering Society/FDA Frontiers in Medical Devices Conference*, May, 2015, Washington DC, United States.

- Dietrich, R., Winkler, T. E., **Ben-Yoav, H.**, Chocron, S. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. The interplay of electrode materials and biomaterials in a catechol-modified chitosan-based sensor for clozapine detection. Oral paper presented at the *AVS 61st International Symposium & Exhibition*, November, 2014, Baltimore, Maryland, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Chocron, S. E., Kim, E., Payne, G. F., Kelly, D. L., and Ghodssi, R. Microsystems for brain health. Poster presented at the *2014 Hilton Head Solid-State Sensors, Actuators and Microsystems Workshop*, June, 2014, Hilton Head, South Carolina, United States (open poster).
- **Ben-Yoav, H.**, Chocron, S. E., Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Towards personalized mental healthcare: an electrochemically-amplified biosensor for clozapine antipsychotic treatment monitoring. Poster presented at the *Medical MEMS and Sensors 2014*, May, 2014, Detroit, Michigan, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Chocron, S. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Biosensor device for clozapine treatment monitoring in schizophrenia. Oral paper presented at the *Entrepreneur Expo 2013: Maryland Innovation Initiative (MII) Session*, November, 2013, Columbia, Maryland, United States (Invited talk).
- Winkler, T. E., **Ben-Yoav, H.**, Chocron, S. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Electrochemical interference in a catechol-modified chitosan redox cycling amplification system for clozapine detection. Oral paper presented at the *224th Electrochemical Society (ECS) Meeting*, October-November, 2013, San Francisco, California, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Chocron, S. E., Restaino, S. M., Costa, G. R., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Bio-amplifying lab-on-a-chip for antipsychotic clozapine treatment monitoring. Poster presented at the *2013 Bioscience Research & Technology Review Day*, November, 2013, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Chocron, S. E., Restaino, S. M., Costa, G. R., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Bio-amplifying lab-on-a-chip for antipsychotic clozapine treatment monitoring. Poster presented at the *2013 Fischell Festival*, October, 2013, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Lab-on-a-chip biosensor for schizophrenia treatment analysis. Poster presented at the *2013 Mid Atlantic Micro/Nano Alliance Spring Symposium*, May, 2013, Gaithersburg, Maryland, United States.
- Zang, F., **Ben-Yoav, H.**, Fan, X. Z., Brown, A. D., Culver, J. N., and Ghodssi, R. Genetically modified Tobacco mosaic virus (TMV)-based electrochemical detection of 2, 4, 6-trinitrotoluene (TNT). Oral paper presented at the *American Vacuum Society 59th International Symposium*, October, 2012, Tampa, Florida, United States.
- **Ben-Yoav, H.**, Dykstra, P. H., Bentley, W. E., and Ghodssi, R. A programmable microfluidic electrochemical nano-biochip for label-free diffusion-restricted DNA hybridization analysis. Oral paper presented at the *22nd Anniversary World Congress on Biosensors*, May, 2012, Cancun, Mexico.
- **Ben-Yoav, H.**, Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Lab-on-a-chip biosensor for schizophrenia treatment analysis. Poster presented at the *2012 Bioscience Research & Technology Review Day*, November, 2012, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Winkler, T. E., Kim, E., Kelly, D. L., Payne, G. F., and Ghodssi, R. Lab-on-a-chip biosensor for schizophrenia treatment analysis. Poster presented at the *2012 Fischell Festival*, October, 2012, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Pomerantseva, E., Gnerlich, M., and Ghodssi, R. *Tobacco mosaic virus* nanotemplates for next generation energy storage and electrochemical sensing. Poster presented at the *2012 ONR Naval Science and Technology Partnership Conference*, October, 2012, Arlington, Virginia, United States.
- **Ben-Yoav, H.**, Dykstra, P. H., Bentley, W. E., and Ghodssi, R. A microfluidic-based electrochemical nano-biochip for label-free diffusion-restricted DNA hybridization analysis. Poster presented at the *22nd Anniversary World Congress on Biosensors*, May, 2012, Cancun, Mexico.
- **Ben-Yoav, H.**, Dykstra, P. H., Bentley, W. E., and Ghodssi, R. A label-free microfluidic-based electrochemical impedance spectroscopy biosensor for DNA hybridization analysis. Poster presented at the *2012 Mid Atlantic Micro/Nano Alliance Spring Symposium*, March, 2012, Annapolis, Maryland, United States.

- **Ben-Yoav, H.**, Dykstra, P. H., and Ghodssi, R. Microfluidic arrayed electrochemical lab-on-a-chip for biomolecules detection at the point-of-care. Oral paper presented at the *2011 Bioscience Research & Technology Review Day*, November, 2011, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Belkin, S., Freeman, A., and Shacham-Diamand, Y. Electrochemical low profile whole-cell biochips. Oral paper presented at the *62nd Annual Meeting of the International Society of Electrochemistry*, September, 2011, Niigata, Japan.
- **Ben-Yoav, H.**, Dykstra, P. H., and Ghodssi, R. A label-free microfluidic-based electrochemical impedance spectroscopy biosensor for DNA hybridization analysis. Poster presented at the *2011 Fischell Festival*, October, 2011, College Park, Maryland, United States.
- **Ben-Yoav, H.**, Freeman, A., Sternheim, M., Amzel T., Fishelson N., Biran A., Pedahzur R., Belkin S., Buchinger S., Reifferscheid G., and Shacham-Diamand, Y. Electrochemical low profile whole-cell bio-chips. Oral paper presented at the *218th Meeting of The Electrochemical Society*, October, 2010, Las Vegas, Nevada, United States.
- **Ben-Yoav, H.**, Freeman, A., Sternheim, M., Amzel T., Fishelson N., Biran A., Pedahzur R., Belkin S., Buchinger S., Reifferscheid G., and Shacham-Diamand, Y. Electrochemical low profile whole-cell bio-chips. Oral paper presented at the *8th International Symposium on Electrochemical Micro & Nanosystem Technologies 2010 Conference*, September, 2010, Cannes Mandelieu, France.
- **Ben-Yoav, H.**, Freeman, A., Sternheim, M., and Shacham-Diamand, Y. Electrochemical impedance analysis of bacterial biofilms on bio-chips. Oral paper presented at the *8th International Symposium on Electrochemical Impedance Spectroscopy*, June, 2010, Algarve, Portugal.
- **Ben-Yoav, H.**, Amzel, T., Freeman, A., Belkin, S., Biran, A., Pedahzur, R., Sternheim, M., and Shacham-Diamand, Y. Effects of external electrical fields on biochip integrated bacterial biofilms for biosensing applications. Poster presented at the *8th International Symposium on Electrochemical Micro & Nanosystem Technologies 2010 Conference*, September, 2010, Cannes Mandelieu, France.
- **Ben-Yoav, H.**, Freeman, A., Sternheim, M., and Shacham-Diamand, Y. Electrochemical impedance analysis of bacterial biofilms on bio-chips. Oral paper presented at the *14th Israel Materials Engineering Conference*, December, 2009, Tel Aviv University, Israel.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., Freeman, A., and Shacham-Diamand, Y. A whole cell electrochemical biosensor for water genotoxicity bio-detection. Oral paper presented at the *Nanotechnology Students Conference*, August, 2009, Bar-Ilan University, Israel.
- **Ben-Yoav, H.**, Freeman, A., Shacham-Diamand, Y. A whole cell electrochemical biosensor for water genotoxicity bio-detection. Oral paper presented at the *International Student Education Foundation Conference*, June, 2009, Hebrew University of Jerusalem, Israel.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., Freeman, A., and Shacham-Diamand, Y. A whole cell electrochemical biosensor for water genotoxicity bio-detection. Oral paper presented at the *Israel Society for Microbiology 2009 Meeting*, March, 2009, Bar-Ilan University, Israel.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., and Shacham-Diamand, Y. A novel microfluidic whole cell biosensor based on electrochemical detection for water toxicity analysis. Poster presented at the *Nano Israel 2009*, March, 2009, Jerusalem, Israel.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., and Shacham-Diamand, Y. A novel microfluidic whole cell biosensor based on electrochemical detection for water toxicity analysis. Oral paper presented at the *The Israel Vacuum Society 2008 Meeting*, October, 2008, Herzliya, Israel.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., Freeman, A., and Shacham-Diamand, Y. A novel microfluidic whole cell biosensor based on electrochemical detection for water toxicity analysis. Oral paper presented at the *PRiME 2008 – Joint international meeting: 214th Meeting of The Electrochemical Society and 2008 Fall Meeting of The Electrochemical Society of Japan*, October, 2008, Hawaii, United States.
- **Ben-Yoav, H.**, Biran, A., Pedahzur, R., Belkin, S., Buchinger, S., Reifferscheid, G., and Shacham-Diamand, Y. A novel micro-fluidic whole cell biosensor based on electrochemical detection for water toxicity analysis. Poster presented at the *7th International Symposium on Electrochemical Micro & Nanosystem Technologies 2008 Conference*, September, 2008, Ein-Gedi, Israel.

- **Ben-Yoav, H.**, Yorish, S., Elad, T., Vernick, S., Belkin, S., and Shacham-Diamand, Y. A novel micro-fluidic whole cell biosensor for water toxicity analysis using bioluminescence detection. Oral paper presented at the *NanoBio-Europe 2007*, June, 2007, Munster, Germany.
- Nano 2 Life Research School. National Institute for Nuclear Science and Technology. June, 2006, Grenoble, France.

PATENTS

1. Shacham-Diamand, Y., Ben-Yoav, H., Belkin, S., Pedahzur, R., Biran, A., Reifferscheid, G., Buchinger, S. System and method for detecting a substance in liquid. U.S. Patent No. 2011/0155587 A1.
2. Ben-Yoav, H., Ghodssi, R. Viral nanoarrays and sensors comprising the same. U.S. Patent No. 2014/0256581 A1.
3. Ben-Yoav, H., Ghodssi, R., Kelly, D. L., Payne, G. F., Kim, E., Winkler, T. E., Chocron, S. E. Analytical micro-devices for mental health treatment monitoring. U.S. Patent Application under review.
4. Winkler, T. E., Ben-Yoav, H., Ghodssi, R. Integrated and standalone label and reagent-free microfluidic devices and microsystems for differential white blood cell counts. International Patent Application as part of the Patent Cooperation Treaty under review.
5. Kim, Y. K., Ben-Yoav, H., Wu, H. C., Bentley, W. E., Ghodssi, R. An enhanced superpositioned bioelectric effect for biofilm treatment. Patent Rights Returned to Government, June 2012.
6. Ben-Yoav, H., Ghodssi, R., Dykstra, P. H. Diffusion-based biosensing approach in miniaturized lab-on-a-chip devices. Patent Rights Returned to Government, May 2012.

TEACHING EXPERIENCE

2015 – Present **Instructor**

Department of Biomedical Engineering, Ben-Gurion University of the Negev

Course: "Cell biology" (367-1-1011)

2012 – 2015 **Guest Instructor**

Department of Electrical and Computer Engineering, University of Maryland

Course: "Design and fabrication of Micro-Electro-Mechanical Systems (MEMS)" (ENEE 605)

- **Curriculum development:**

- Taught and created interactive teaching tools
- Identified biological and engineering scientific learning requirements for the students

2014 – 2015 **Guest Instructor**

Department of Bioengineering, University of Maryland

Course: "Fundamentals of biosensor techniques, instrumentation, and applications" (BIOE 431/631)

2007 – 2010 **Teaching Assistant**

Department of Electrical Engineering – Physical Electronics, Tel Aviv University

Course: "Advanced micro-technologies"

- **Curriculum development:**

- Prepared and taught recitation classes, assigned homework, and implemented new microfabrication software technologies.

2007 – 2008 **Teaching Assistant**

Department of Electrical Engineering – Physical Electronics, Tel Aviv University

Course: "Introduction to VLSI"

MENTORING EXPERIENCE

2011 – 2015 University of Maryland

- *Bioengineering Graduate Students Thesis*: Thomas Winkler, Sheryl Chocron, George Banis.
- *Bioengineering Rotation Graduate Students*: Nicholas Woolsey, Sheryl Chocron, Stephan Restaino, Bharath Ramaswamy, Bao-Ngoc Bich Nguyen
- *Undergraduate Project Students*: Gillian Costa (**2012 Maryland Engineering Research Internship Teams - MERIT best project award**), Bryce Weisberger

2004 – 2010 Tel Aviv University

- *Graduate Student Thesis*: Tal Amzel
- *Undergraduate Project Students*: Dana Landau, Ma'ayan Gal-On, Omer Shlomovits, Emil Alekprov, Doron Albert, Tal Rotem, Dror Aharoni, Yoni Fleischmann, Leon Hibnik, Gil Dotan, Ron Meir, Adi Rubin, Alana Jakobi

SERVICE

A. University

2008 – 2010 **Founder and 1st chairman** of the Tel Aviv University Student Chapter, Electrochemical Society. Tel Aviv University, Israel

B. Professional

- Journal Reviewer –
Biosensors and Bioelectronics, Biomedical Microdevices, Electrochimica Acta, Sensors and Actuators B: Chemical, Biotechnology and Bioengineering, Analytica Chimica Acta, Chemosphere, Analyst, Talanta, Electrochemistry Communications, Bioelectrochemistry, Water Research, Research and Reports in Biology, Journal of Microelectromechanical Systems (JMEMS), Analytical Chemistry, African Journal of Biotechnology, Sensors, Langmuir, Microelectronic Engineering, Journal of Medical Entomology, and Clinical Pharmacology and Therapeutics.

C. Military

1997 – 2000 **Combat soldier at the Israel Defense Forces**

Mentored and instructed a team of soldiers with professional and personal skills in addition to combat experience.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

2008 – Present Electrochemical Society (ECS)

2010 – Present International Society of Electrochemistry (ISE)

2015 – Present Biomedical Engineering Society (BMES)