ALEXANDER GOLBERG

Email: agolberg@gmail.com

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EDUCATION

Postdoctoral	**Harvard Medical School**. Center for Engineering in Medicine. Host: Martin L. Yarmush (2012-2014)
Postdoctoral	**University of California, Berkeley** Bioengineering/Mechanical Engineering, Host: Boris Rubinsky. (2010-2011).
Ph.D.	**Hebrew University of Jerusalem**, **Israel.** Bioengineering. (2007-2010). Supervisor: Boris Rubinsky, Committee: Haim D. Rabinowitch, Michael Belkin
B.Sc (cum laude)	**Technion, Israel.** Biotechnology and Food Engineering. (2003-2007). Major: Food Engineering.
High School	**Leyada, Hebrew University High School, Jerusalem, Israel** (1997-2000). Major: Physics and Computer Science

AWARDS AND HONORS

1997 First place in regional Olympiad in astronomy and cosmic physics, Kursk, Russia
2003 HAAS award for excellence in studies and community work, Israel and USA
2004-2006 Dean Award, Technion Food Eng. for excellence in studies, Israel
2007 BSc Cum laude in Biotechnology and Food Engineering, Israel
2008 Electroporation based technologies and treatments, Travel Award, November 15. Ljubljana, Slovenia.
2010 Extensive report and coverage by Nature, Reuters, Al-Jazzera, Russian 1st and Israel news channels for the "biological battery invention" http://www.reuters.com/video/2010/07/28/potato-battery-new-and-improved?videoId=127046608
2011 Regional finalist in California, Clean Tech Open competition, USA. Macroalgae biorefineries for sustainable food and energy production.
2012 ECOR Postdoctoral Fellowship Award from the MGH Fund for Medical Discovery, Massachusetts General Hospital, USA. (9 awardees from 88 applications)
2012 Bio and Food Electrotechnologies. Travel award. Solerno, Italy, Sep 26-28, 2012
2012 Green Talents 25 World High Potentials in Sustainable Development Award. German Federal Ministry of Education and Research. (25 awardees from 403 applications, 69 countries) http://www.greentalents.de/890.php , Germany.
2013 Gordon Research Seminar on Tissue Repair and Regeneration. Travel Award. Invited speaker. June 15-18, USA.
2013 ISES Abraham Kogan Session Lecture Award on Renewable Energy. October 7. Israel.
2014 ILANIT Conference Travel Award. February 11. Israel.
2014 MGPA Postdoc Recognition Award (nominated). USA
2014 Robert B. Lindberg Award and Medal for the Best Scientific Paper by nonphysician from American Burn Association.
2014 Shriners Hospital for Children Fellowship (declined due to the move to faculty at TAU).

PROFESSIONAL EXPERIENCE

2005-2010 **Life Technologies (Invitrogen)**
R&D research engineer
2006-2010 **Toppik Technologies and Investments Ltd,**
Professional consulting services in agro and food engineering.

Military service in Israel Air Defense Network. (2000-2003)

SERVICE

Guest Editor: Technology
Reviewer: Scientific Reports (Nature), Technology, Biotechnology and Bioengineering, Biomedical Engineering online, J. Membrane Biology, IEEE Transactions on Plasma Science, Process Biochemistry, Chemical Engineering Research Communication, Journal of Vascular and Interventional Radiology, Bioelectrochemistry
Conferences: ASME 2012 Renewable energy Topic organizer.

MEMBERSHIPS: NYACS 2011-, ASME 2013

FUNDING

ECOR Postdoctoral Fellowship Award from the MGH Fund for Medical Discovery
$40,000 9/2012-8/2013, role: PI
Shriners Foundation Small Grant
$120,000 1/2013-12/2014 , PI: Yarmush , role: fellow
BWH Innovation microgrant. PI: Lian
$11,000 3/2014-9/2014, role: Co-I.

ADDITIONAL

Volunteered as an instructor in Haifa Municipal School. Taught mathematics in the basic school (2004-2005).
Volunteered in Haifa geriatric home. Community work (2005).
From 2006 to 2007 participated in Technion entrepreneurship club.

LANGUAGES

English- Fluent.
Hebrew- Fluent
Russian- Fluent

PUBLICATIONS

Journal Papers:

1 **Golberg, A**, M. Belkin and B. Rubinsky. Irreversible Electroporation for Microbial Control of Drugs in Solution. AAPS PharmSciTech, 10 (3): 881-886, 2009.
2 **Golberg, A**. and B. Rubinsky. A statistical model for multidimensional irreversible electroporation cell death in tissue. BioMedical Engineering OnLine, 9:13, 2010
3 **Golberg, A**., H. D. Rabinowitch and B. Rubinsky. Galvanic apparent internal impedance: an intrinsic tissue property. Biochemical and biophysical research communications, 389: 168-171, 2009
4 **Golberg A**., H.D. Rabinowitch, and B. Rubinsky. Zn/Cu- vegetative batteries, bioelectrical characterizations and primary cost analyses. J. Renewable Sustainable Energy, doi:10.1063/1.3427222 2010, highlighted in ***Nature***, 465,848, 2010**.**
5 **Golberg, A**. and B. Rubinsky. The effect of electroporation type pulsed electric fields on DNA in aqueous solution. Technology in Cancer Research and Treatment, 9(4):423-430, 2010.
6 **Golberg, A**, Y. Fischer, M. Belkin and B. Rubinsky. Intermittently Delivered Pulsed Electric Fields for Sterile Storage of Turbid Media. IEEE Transactions on Plasma Science, 38 (11):3211-3218, 2010.
7 **Golberg,* A**, S. Laufer*, H. D.Rabinowitch and B. Rubinsky. In vivo non thermal irreversible electroporation impact on rat liver galvanic apparent internal resistance. Phys. Med. Biol. 56: 951-963, 2011. * Equal contribution.
8 **Golberg, A**, Rae C.S, Rubinsky B. Listeria monocytogenes cell wall constituents charge effect on irreversible electroporation threshold. Biochimica et Biophysica Acta-Biomembranes, 1818(3):689-94, 2012
9 **Golberg, A.** and B. Rubinsky. A numerical study towards electroporation based treatment planning considering muscle contraction. Technology in Cancer Research and Treatment, 11(2):189-201, 2012.
10 Francois F, Rubinsky L, **Golberg, A** and B Rubinsky. Variable Electric Fields for High Throughput Electroporation Protocol Design. Biotechnology and Bioengineering, 109(8): 2168-2171, 2012, ***Editor Spotlight Key Article***
11 Linshiz G, **Golberg, A**, Konry T, Hillson N. Fusion of Biology, Computer Science and Engineering – in the quest to efficient and successful Synthetic Biology. Perspectives in Biology and Medicine, 55(1), 2013.
12 **Golberg, A**., Bei M., Sheridan R. and Yarmush M.L.Regeneration and control of human fibroblast cell density by intermittently delivered pulsed electric fields. Biotechnology and Bioengineering, 110(6):1759-68,2013
13 **Golberg, A**, Analytical model of local distribution of chemicals in tissues with first order rate metabolism kinetics. Chemical Engineering Research Communications, 201(1): 102-119, 2013.

14 **Golberg, A** and Yarmush M.L. Nonthermal Irreversible electroporation: Fundamental, Applications, Challenges. IEEE Transactions on Biomedical Engineering, 60 (3):707-14, 2013
15 **Golberg, A**, Yarmush,M.L, Konry,T. Pico-liter immunosorbent droplet microfluidic platform for point-of-care tetanus diagnostics. Microchimica Acta, 180 (9-10): 855-860, 2013.
16 **Golberg, A.** The Impact of Pulsed Electric Fields on Cells and Biomolecules, a Comment on 'Lightning-triggered electroporation and electrofusion as possible contributors to natural horizontal gene transfer by Tadej Kotnik'. Physics of Live Reviews, 10 (3): 382-383, 2013.
17 **Golberg, A**, Broelsch, G.F, Bohr,S, Mihm, M.C, Austen, W.G, Albadawi,H, Watkins,M.T, Yarmush, M.Non-Thermal, Pulsed Electric Field Cell Ablation: A Novel Tool for Regenerative Medicine and Scarless Skin Regeneration. Technology, 1: 1-8, 2013
18 **Golberg, A**, Vitkin,E, Linshiz,G, Ahmad Khan,S, Hillson, N.J, Yakhini Z, Yarmush,M.L. Proposed Design of Distributed Marine Biorefineries: Thermodynamics, Technology, and Sustainability Implications for Developing economies. Biofuels, Bioproducts & Biorefining, 8(1): 67-82, 2014
19 Yarmush, M.L, **Golberg, A**, Sersa,G, Kotnik,T, Miklavcic,D. Electroporation Based Technologies for Medicine: Principles, Applications, and Challenges. Annual Reviews of Biomedical Engineering 2014, in print
20 Deipolyi, AR, **Golberg, A**, Yarmush,ML, Arellano,RS, Oklu,R. Irreversible electroporation: evolution of a laboratory technique to interventional oncology. Diagnostic and Interventional Radiology 20(2):147-54, 2014
21 Konry,T, **Golberg, A**, Yarmush,M.L. Live individual cell functional phenotyping in droplet reactor. Scientific Reports Scientific Reports, **3**, Article number 3179 doi:10.1038/srep03179. 2014
22 **Golberg, A***, Linshiz, G*, Kravets, I, Stawski, N, Hillson, N, Yarmush ML,Marks, RS, Konry, T. Cloud-enabled microscopy and droplet microfluidic platform for specific detection of Escherichia coli in water. PLoS ONE 9(1): e86341.2014 * Equal contributions.
23 **Golberg, A**, Broelsch, G.F, Vecchio, D, Khan, S., Hamblin, M.R, Austen, W.G, Sheridan R.L, Yarmush, M. Pulsed electric fields for burn wound disinfection. Journal of Burn Care and Research. In print. ***Robert B. Lindberg Award*** from American Burn Association.
24 **Golberg, A**, Broelsch, G.F, Vecchio, D, Khan, S., Hamblin, M.R, Austen, W.G, Sheridan R.L, Yarmush, M. Eradication of multidrug-resistant *A. baumanniii* in burn wounds by antiseptic pulsed electric fields. Technology. In print.

Conference full papers (peer reviewed)

25 **Golberg**, A. Listeria monocytogenes growth control in milk by intermittently delivered pulsed electric fields. Proceedings of Bio and Food Electrotechnologies, pp 1-6, Italy, 2012.
26 **Golberg**, A, Linshiz,G, Hillson,N.J, M. Koudritsky, Chemodanov,A. Distributed marine biorefineries for developing economies, IMECE2012-86051, pp 1-9, Proceeding of ASME Congress and Exhibition, 2012.
27 Blumrosen,G*****, **Golberg,A***, Abazari,A***,** Tonner, M, Yarmush ML. Efficient Procedure and Methods to Determine Critical Electroporation Parameters. Accepted to Proceedings of IEEE CBMS 2014. * Equal contributions

Books and Book Chapters:

28 **Golberg**,A Y. Fischer, and B. Rubinsky. The Use of Irreversible Electroporation in Food Preservation. In Irreversible Electroporation, B. Rubinsky, Ed.: Springer Berlin Heidelberg, 2009, pp. 273-312
29 **Golberg,A.** Bioelectrochemical phenomena: electrolysis and electroporation. Scholar's press, 228 pages. 2013. ISBN-10: 3639510690.
30 **Golberg** A., Rubinsky B. Mass Transfer phenomena in Electroporation. In Transport in Biological Media. S.Becker, Ed.: Academic Press, Elsevier. 2013, pp 455-492.

Conference Presentations, Abstracts, Posters and Major Seminars:

1 **Golberg A.** M. Belkin and B. Rubinsky, Irreversible Electroporation for Microbial Control of Drugs in Solution, Electroporation Based Technologies and Treatments 2009. Lubiana, Slovenia. Invited speaker.
2 **Golberg, A**. Macro Algae as a sustainable biomass source for chemicals and biofuels, Cleantech Open National Investor Conference,2011,l San Jose, CA.
3 **Golberg,A.** Irreversible electroporation in medicine and biotechnology, Invited seminar at AntiCancer Inc., San Diego,CA, 2011
4 **Golberg, A**. Electrolyses and electroporation in biotechnology, Harvard Medical School, Boston, 2011
5 **Golberg,A**. Distributed Biorefineries for developing countries, MIT Energy Initiative, Energy Club seminar 2012.

6 **Golberg,A**. Distributed Biorefineries thermodynamic analyses and optimization, Technion, Mechanical Engineering Faculty, Seminar, Sep 5, 2012.
7 **Golberg, A**.Microbial Load control by Intermittently delivered pulsed electric fields, Bio and Food Electrotechnologies, Solerno, Italy, Sep 26-28, 2012, presentation. **Conference travel award**
8 **Golberg, A**. Distributed marine biorefineries for developing economies, FONA FORUM for sustainable development, Berlin, Oct 20-24, Germany, 2012, poster. **Conference travel award**
9 **Golberg, A**, Irreversible electroporation in medicine, UIC, Department of Biomedical Engineering, Chicago, Nov.5, 2012. Invited seminar.
10 **Golberg, A**, Linshiz,G, M. Koudritsky, Chemodanov,A, Hillson,N.J . Distributed marine biorefineries for developing economies, ASME Congress and Exhibition, Houston, Nov 9-15, TX, 2012, presentation.
11 **Golberg, A**, Linshiz,G, M. Koudritsky, Chemodanov,A, Hillson,N.J . Distributed marine biorefineries for developing economies, Eilot-Eilat Renewable energy conference, Eilat, Nov 28-30, Israel, 2012, poster.
12 **Golberg, A**, Broelsch, G.F, Bohr,S, Mihm, M.C, Austen, W.G, Albadawi,H, Watkins,M.T, Yarmush, M, Non-thermal, irreversible electroporation (IRE) allows for controlled ablation of cellular compartments followed by scarless regeneration of skin in a rat model, Harvard Surgery Day, 2013, poster.
13 **Golberg, A**, Broelsch, G.F, Bohr,S, Mihm, M.C, Austen, W.G, Albadawi,H, Watkins,M.T, Yarmush, M, Towards tissue regeneration using irreversible electroporation, **Gordon Research Seminar. Invited Speaker**. June 2013.
14 Vitkin,E, Linshiz,G **, Golberg, A**, Hillson, N.J, Yarmush,M.L, Keasling J., Yakhini Z. Computationl modeling of two-step bioethanol production:marin macroalgae Ulva Lactuca study. Poster and presentation. IBS13 conference. Beer-Sheva, Israel, June 2013.
15 Brölsch, GF, **Golberg**, A, Bohr,S, Mihm,MC Jr., Albadawi,H, Watkins,MT, Yarmush, ML, Austen WG Jr. LOP35: Scarless regeneration of rat skin following ablation by non-thermal irreversible electroporation. Plastic and Reconstructive Surgery. vol. 132(2): 108.
16 Khan S, **Golberg,A**, Brölsch, GF, Bohr S, Mihm,MC Jr., Albadawi,H, Watkins MT, Austen,WG, Jr., Yarmush, ML ,Non-Thermal, Irreversible Electroporation: A Novel Tool for Scarless Skin Regeneration. Massachusetts Chapter of the American College of Surgeons 2013 Massachusetts Chapter of the American College of Surgeons Poster Presentation. December 2013.
17 **Golberg, A**, Vitkin,E, Linshiz,G, AhmaKhan,S, Hillson, N.J, Yakhini Z, Yarmush,M.L, Proposed Design of Distributed Marine Biorefineries: Thermodynamics, Technology, and Sustainability Implications for Developing economies. ISES Abraham Kogan Session Lecture, October 7, 2013. Technion Israel.
18 **Golberg, A**, Khan, S, Broelsch, G.F, Bohr,S, Mihm, M.C, Austen, W.G, Albadawi,H, Watkins,M.T, Yarmush, M, "Non-Thermal, Pulsed Electric Field Cell Ablation: A Novel Tool for Regenerative Medicine and Scarless Skin Regeneration. Galil Biomedicine IV. October 8, 2013. Khiryat Shmona, Israel.
19 **Golberg, A**, Khan, S, Broelsch, G.F, Bohr,S, Mihm, M.C, Austen, W.G, Albadawi,H, Watkins,M.T, Yarmush, M, Non-Thermal, Pulsed Electric Field Cell Ablation: A Novel Tool for Regenerative Medicine and Scarless Skin Regeneration. FISEB (ILANIT) Congress 7. February 11, 2014. Eilat, Israel. Poster Session.
20 **Golberg, A,** Broelsch G.F, Vecchio, D, Khan, S, Hamblin, M.R, Austen, W.G, Sheridan, R.L, Yarmush, M.L. Pulsed electric fields for burn wound disinfection in the murine model. American Burn Association, annual conference. Oral presentation. 25 March 2014, Boston MA. Abstract in Supplement to Journal of Burn Care & Research, 35(5):S98. 2014.
21 **Golberg,A,** Sheridan,R.L, Austen W.J. Jr., Yarmush, M.L. Pulsed electric fields for wound management. 10th Early Stage Life Science Conference. April 10,2014. Boston, MA. Oral presentation. Abstract in Proceedings page 32.

Patents

1 Rubinsky,B, Belkin,M,**Golberg A**, Sverdlik A. WIPO Patent Application WO/2010/113150**.** An apparatus, system and method for preventing biological contamination to materials during storage using pulsed electric energy.
2 **Golberg A**, Rubinsky B., United States Application 20130197425. Current cage for reduction of non-target tissue exposure to electric fields in electroporation based treatment.
3 **Golberg A,** Yarmush M, Broelsch F, Sheridan R, Austen J. PCT patent application. Device for pulsed electric field skin treatment.

Business competitions

1 Global Clean Tech Open Business Competition. Led the team, developed the techno-economical analyses for small scale biorefineries for the production of carbon neutral fuels and zero emission electricity from macro algae. The team passed to semi-finals in California regional competition. October 2011.
2 Berkeley B-Plan competition. Led the team, wrote a business plan with techno-economical analyses for the production

of chemicals and fuels from algae. The team passed to the competition finals. April 2011.

3 Made for China, Global competition of sustainable technologies for China, USA finalist, October 2011. Proposal "Small scale biorefineries for rural China biofuel production".

Media releases

Boiled potato battery project

Reuters: http://www.reuters.com/news/video/story?videoId=127046608

Al-Jaseera: http://www.youtube.com/watch?v=lZfs2keZnw4

Russian First channel: http://www.1tv.ru/news/other/158559

Project implementation in the developing countries:

http://www.scidev.net/en/new-technologies/news/potato-and-plantain-batteries-show-promise-1.html

Marine Biorefineries

http://www.scidev.net/en/climate-change-and-energy/renewable-energy/news/small-seaweed-refineries-could-meet-transport-needs-1.html

Burns disinfection using pulsed electric fields

http://www.massgeneral.org/about/pressrelease.aspx?id=1707