

# Curriculum Vitae and List of Publications

Alon Korngreen

## Education

From-To	Institute	Area of Speciality	Degree
1988-1991	Ben-Gurion University of the Negev, Beer-Sheva, Israel	Chemistry	B.Sc., <i>Cum Laude</i>
1991-1993	Ben-Gurion University of the Negev, Dept. of Chemistry	Biophysics	M.Sc., <i>Summa Cum Laude</i>
1993-1997	Ben-Gurion University of the Negev, Dept. of Chemistry	Biophysics	Ph.D., <i>Summa Cum Laude</i>

## Academic positions

From-To	Institute	Research Area	Title
2018-	Faculty of Life Sciences Bar-Ilan University, Ramat-Gan, Israel	Neurophysiology	Prof.
2012-2018	Faculty of Life Sciences Bar-Ilan University, Ramat-Gan, Israel	Neurophysiology	Assoc. Prof.
2007-2012	Faculty of Life Sciences Bar-Ilan University, Ramat-Gan, Israel	Neurophysiology	Senior Lecturer
2001-2007	Faculty of Life Sciences Bar-Ilan University, Ramat-Gan, Israel	Neurophysiology	Lecturer
1997-2001	Abteilung Zellphysiologie Max-Planck Institut für medizinische Forschung, Heidelberg, Germany	Neurophysiology	Postdoctoral fellow with Nobel laureate Prof. Bert Sakmann
1993-1997	Dept. of Chemistry Ben-Gurion University of the Negev, Beer Sheva, Israel		Instructor
1990-1993	Dept. of Chemistry Ben-Gurion University of the Negev, Beer Sheva, Israel		Teaching Assistant
1989-1991	Dept. of Chemistry Ben-Gurion University of the Negev, Beer Sheva, Israel		Undergraduate Research Assistant

**Academic Administrative Positions**

<b>From-To</b>	<b>Institute</b>	<b>Position</b>
2009-2011	Bar-Ilan University	Head of the Faculty of life sciences graduate students committee.
2011-2015	Bar-Ilan University	Head of the undergraduate brain studies program
2018-	Bar-Ilan University	Chair of the Animal Care and Use committee.
2019-	Bar-Ilan University	Head of the Gonda Brain Center

**Other positions**

<b>Date</b>	<b>Membership</b>
1997-2010	The Biophysical Society (USA)
2000-present	The Society of Neuroscience (USA)
2001-present	The Israeli Society of Neuroscience
2004-2008	The Israeli Society of Physiology and Pharmacology
2007-2015	The Physiological Society (England)
2010- 2012	American Physiological Society
<b>Date</b>	<b>Reviewer for Journals (alphabetical)</b>
2013	Brain Stimulation
2015	Elife
2008-present	Review editor of Frontiers in Cellular Neuroscience
2012-present	Review editor of Frontiers in Synaptic Neuroscience
2009-present	Journal of Neurophysiology (1-2 papers per year)
2007- present	Journal of Neuroscience (2-3 papers per year)
2004,2006, 2008, 2011,2014	Journal of Physiology
2012-present	PLoS Computational biology (1 paper per year)
<b>Date</b>	<b>Reviewer for Research Foundations</b>
2006-present	Israel Science foundation, Reviewer (1-2 proposals per year)
2008-	Bi-national science foundation (1-2 proposals per year)
2013,2014	German Research Foundation (DFG)

2011	Welcome trust
------	---------------

### Awards and Fellowships

Date	Awards and Honors
1989	The Gregory Ginzburg Memorial Award, Ben-Gurion University, Chemistry Dept.
1990	The Amnon Zingerman Memorial Award for academic achievements in B.Sc. studies, Ben-Gurion University, Chemistry Dept.
1990	The Amos De-Shalit Summer Scholarship, Weizmann Institute of Science
1991	The Ruth and Milton Orchin Award for academic achievements in B.Sc., Ben-Gurion University, Chemistry Dept.
1993	The Ruth and Milton Orchin Award for excellence in M.Sc. studies, Ben-Gurion University, Chemistry Dept.
1995	The Wolf Foundation Scholarship for excellence in M.Sc. studies, Israel
1995	The Shariv Award for excellence in Ph.D. studies, Machteshim Chemical Co., Israel
1996	The Israeli Chemical Society Annual Award for excellence in Ph.D. studies
1997	The Kraitman Award for academic excellence in Ph.D. studies, Ben-Gurion University
1997	The MINERVA Scholarship for postdoctoral studies. Max-Planck Society, Germany (extended for two years 1998).
Date	Awards and Honors
1989	The Gregory Ginzburg Memorial Award, Ben-Gurion University, Chemistry Dept.
1990	The Amnon Zingerman Memorial Award for academic achievements in B.Sc. studies, Ben-Gurion University, Chemistry Dept.
1990	The Amos De-Shalit Summer Scholarship, Weizmann Institute of Science
1991	The Ruth and Milton Orchin Award for academic achievements in B.Sc., Ben-Gurion University, Chemistry Dept.
1993	The Ruth and Milton Orchin Award for excellence in M.Sc. studies, Ben-Gurion University, Chemistry Dept.

### Research Areas

My research touches some of the basic yet still unresolved questions in neuroscience: How do neurons process information? What is the neuronal code at the cellular level? How does synaptic integration affect neuronal computation? To address these questions my lab combines electrophysiology of neurons in acute brain slices with techniques in computational neuroscience. Over the past decade, we have developed several computational techniques aiming at constraining numerical models for complex cortical neurons. Thus, my research has aspects from computer science, neuronal computation, biophysics and neurophysiology.

## List of Publications

1. **Korngreen, A.** and Priel, Z. (1994) Simultaneous measurement of intracellular calcium and ciliary beating. *Biophys. J.* **67**, 377-380
2. Tarasiuk, A., Bar-Shimon, M., Gheber, L., **Korngreen, A.**, Grossman, Y. and Priel, Z. (1995) Extracellular ATP induces hyperpolarization and motility stimulation of ciliary cells. *Biophys. J.* **68**, 1163-1169
3. Alfahel, E., **Korngreen, A.**, Parola, A.H. and Priel, Z. (1996) Purinergically induced membrane fluidization in ciliary cells: characterization and control by calcium and membrane potential. *Biophys. J.* **70**, 1045-1053
4. **Korngreen, A.** and Priel, Z. (1996) Purinergic stimulation of rabbit ciliated airway epithelia: control by multiple calcium sources. *J. Physiol. (Lond.)* **497**, 53-66
5. **Korngreen, A.**, Gold'shtein, V. and Priel, Z. (1997) Realistic modeling of biphasic calcium transients in electrically nonexcitable cells. *Biophys. J.* **73**, 659-673
6. Gheber, L., **Korngreen, A.** and Priel, Z. (1998) Effect of viscosity on metachrony in mucus propelling cilia. *Cell Motil. Cytoskeleton* **39**, 9-20
7. **Korngreen, A.**, Ma, W., Priel, Z. and Silberberg, S.D. (1998) Extracellular ATP directly gates a cation-selective channel in rabbit airway ciliated epithelial cells. *J. Physiol. (Lond.)* **508**, 703-720
8. Weiyuan, M., **Korngreen, A.**, Uzlaner, N., Priel, Z. and Silberberg, S.D. (1999) Extracellular Na<sup>+</sup> regulates airway ciliary motility by inhibiting a P2X receptor. *Nature* **400**, 894-897
9. **Korngreen, A.** and Sakmann, B. (2000) Voltage gated K<sup>+</sup> channels in layer 5 neocortical pyramidal neurones from young rats: subtypes and gradients. *J. Physiol.* **525**, 621-639
10. Gensler, S., Sander, A., **Korngreen, A.**, Traina, G., Giese, G. and Witzemann, V. (2001). Acetylcholine receptor- and -subunits tagged with green fluorescent protein are incorporated at the neuromuscular junction *in vivo*. *Eur. J. Biochem.* **268**, 2209-2217
11. Schaefer, A.T., Helmstaedter, M., Sakmann, B. and **Korngreen, A.** (2003) Correction of conductance measurements in non-space-clamped structures: 1. Voltage-gated K<sup>+</sup> channels. *Biophys. J.* **84**, 3508-3528
12. **Korngreen, A.**, Kaiser, KMM., Zilberter Y. (2005) Subthreshold Inactivation of Voltage-gated K<sup>+</sup> Channels Modulates Action Potentials in Neocortical Bitufted Interneurones *J. Physiol.* **562**, 421-437.
13. Peter, C., **Korngreen, A.** and Witzemann, V. (2005). Mutation of single murine acetylcholine receptor subunits reveals differential contribution of P121 to acetylcholine binding and to channel opening. *Pflug. Arch. Eur. J. Physiol.* **450**, 178-184
14. Keren, N. Peled, N. and **Korngreen A.** (2005). Constraining compartmental models using multiple voltage-recordings and genetic algorithms. *J. Neurophysiol.* **94**: 3730-3743

15. Ma, W., **Korngreen, A.**, Weil, S., Ben-Tal Cohen, E., Priel, A., Kuzin, L., Silberberg, SD. (2006). Pore properties and pharmacological features of the P2X receptor channel in airway ciliated cells. *J. Physiol.* **571**: 503-517.
16. Gurkiewicz, M., **Korngreen, A.** (2006) Recording, Analysis and Function of Dendritic Voltage-Gated Channels. *Pflug. Arch. Eur. J. Physiol.* **453**: 283-292
17. Schaefer, AT., Helmstaedter, M., Schmitt, AC., Bar-Yehuda, D., Almog, M., Ben-Porat, H., Sakmann, B. and **Korngreen, A.** (2007) Dendritic voltage-gated K<sup>+</sup> conductance gradient in neocortical pyramidal neurones. *J. Physiol.* **579**: 737-752.
18. Michaelievski, I., **Korngreen A.**, and Lotan, I. (2007) Interaction of syntaxin 1A with a presynaptic voltage-gated K<sup>+</sup> channel: a possible mechanism for modulation of synaptic integration. *Pflug. Arch. Eur. J. Physiol.* **454**:477-494
19. Gurkiewicz, M., and **Korngreen, A.** (2007). A numerical approach to ion channel modelling using whole-cell voltage-clamp recordings and a genetic algorithm. *PLoS Comp Biol* **3(8)**: e169
20. Segev D., and **Korngreen, A.** (2007). Kinetics of two voltage-gated K<sup>+</sup> conductances in substantia nigra dopaminergic neurons. *Brain Res* **1173**: 27-35.
21. Bar-Yehuda, D., and **Korngreen, A.** (2007). Cellular and network contributions to excitability of layer 5 neocortical pyramidal neurons in the rat *PLoS ONE* **2(11)**: e1209
22. Hurwitz, I., Ophir, A., **Korngreen, A.**, Koester, J., and Susswein AJ. (2008) Currents Contributing to Decision-Making in Neurons B31/B32 of Aplysia. *J. Neurophysiol.* **99**: 814–830
23. Bar-Yehuda, D., and **Korngreen, A.** (2008). Space clamp problems when voltage clamping neurons expressing voltage-gated conductances. *J. Neurophysiol* **99**: 1127–1136
24. Pomp O, Brokhman I, Ziegler L, Almog M, **Korngreen A**, Tavian M, Goldstein RS. (2008) PA6-induced human embryonic stem cell-derived neurospheres: a new source of human peripheral sensory neurons and neural crest cells. *Brain Res.* **1230**:50-60.
25. Bar-Yehuda D., Hana Ben-Porat, H., and **Korngreen A.** (2008) Dendritic excitability during increased synaptic activity in rat neocortical L5 pyramidal neurons *Eur J Neurosci*, **28**, 2183–2194
26. Keren, N., Bar-Yehuda, D., and **Korngreen, A.** (2009) Experimentally guided modeling of dendritic excitability in rat neocortical pyramidal neurons. *J. Physiol.* **587**: 1413-1437.
27. Almog, M. and **Korngreen, A.** (2009) Characterization of voltage-gated Ca<sup>2+</sup> channels in layer 5 neocortical pyramidal neurons from rats *PLoS ONE*, **4**:e4841.
28. Regev N, Degani-Katzav N, **Korngreen A**, Etzioni A, Siloni S, Alaimo A, Chikvashvili D, Villarroel A, Attali B, Lotan I, (2009) Selective Interaction of Syntaxin 1A with KCNQ2: Possible Implications for Specific Modulation of Presynaptic Activity. *PLoS ONE* **4(8)**: e6586.

29. Bronfeld M, Belelovsky K, Erez Y, Bugaysen J, **Korngreen A**, Bar-Gad I. (2010) Bicuculline induced chorea manifests in focal rather than globalized abnormalities in the activation of the external and internal globus pallidus. *J Neurophysiol.* 104(6):3261-75.
30. Bugaysen J, Bronfeld M, Tischler H, Bar-Gad I, **Korngreen A**. (2010) Electrophysiological characteristics of globus pallidus neurons. *PLoS One* 5(8): e12001.
31. Tischler, H., Wolfus, S., Friedman, A., Perel, E., Pashut, T., Lavidor, M., **Korngreen A.**, Yeshurun, Y, Bar-Gad, I. (2011) Mini-coil for magnetic stimulation in the behaving primate, *J. Neurosci Methods.* 15; 194(2): 242-51.
32. Gurkiewicz M, **Korngreen A**, Waxman SG, Lampert A. (2011). Kinetic Modeling of Nav1.7 Provides Insight Into Erythromelalgia-associated F1449V Mutation. *Journal of Neurophysiology* 105(4): 1546-57
33. Pashut, T., Wolfus, S. Friedman, A., Lavidor, M. Bar-Gad, I. Yeshurun, Y., and **Korngreen A.** (2011) Mechanisms of magnetic stimulation of central nervous system neurons. *PLoS Computational Biology* 7(3): e1002022
34. Bugaysen J, Bar-Gad I and **Korngreen A** (2011). The impact of stimulation induced short-term synaptic plasticity on firing patterns in the globus pallidus of the rat. *Frontiers in Systems Neuroscience* 5:16.
35. Berger, U., **Korngreen, A.**, Bar-Gad, I., Friedman A., Wolfus, S., Yeshurun, Y., and Lavidor M. (2011) Magnetic stimulation intensity modulates motor inhibition. *Neuroscience Letters.* 504(2): 93-7.
36. Ben-Shalom R, Aviv A Razon, B. and **Korngreen A.** (2012) Optimizing ion channel kinetics using a massively parallel genetic algorithm on a graphical processing unit. *Journal of Neuroscience Methods.* 15;206(2):183-94
37. Tischler, H. Moran A, Belelovsky K, Bronfeld M, **Korngreen A**, Bar-Gad I. (2012) Changes in basal ganglia processing of cortical input following magnetic stimulation in Parkinsonism. *Neurobiology of disease* 48, 464-473
38. Ben-Shalom R, Liberman G, **Korngreen A.** (2013) Accelerating compartmental modeling on a graphical processing unit. *Front Neuroinform.*18;7:4.
39. Bugaysen J, Bar-Gad I, **Korngreen A.** (2013) Continuous modulation of action potential firing by a unitary GABAergic connection in the globus pallidus in vitro. *J Neurosci.* 31;33(31):12805-9
40. M Brody, and **Korngreen. A.** (2013) Simulating the effects of short-term synaptic plasticity on postsynaptic dynamics in the globus pallidus *Front. Syst. Neurosci.*, 7:40,1-11 | doi: 10.3389/fnsys.2013.00040
41. Lavian H, Ben Porat H and **Korngreen A** (2013) High and low frequency stimulation of the subthalamic nucleus induce prolonged changes in subthalamic and globus pallidus neurons. *Front. Syst. Neurosci.* 7:73,1-8. doi: 10.3389/fnsys.2013.00073

42. Tzachi Sabati; Bat-Sheva Galmidi; Alon **Korngreen**; Naomi Zurgil; Mordechai Deutsch *J. Biomed. Opt.* 18 (12), 126010-20
43. Almog M, **Korngreen A.** (2014) A quantitative description of dendritic conductances and its application to dendritic excitation in layer 5 pyramidal neurons. *J Neurosci.* 34(1):182-96.
44. Pashut T, Magidov D, Ben-Porat H, Wolfus S, Friedman A, Perel E, Lavidor, M, Bar-Gad I, Yeshurun Y and **Korngreen A** (2014) Patch-clamp recordings of rat neurons from acute brain slices of the somatosensory cortex during magnetic stimulation. *Front. Cell. Neurosci.* 8:145. 1-12 doi: 10.3389/fncel.2014.00145
45. Lavian H, **Korngreen A.** (2016) Inhibitory short-term plasticity modulates neuronal activity in the rat entopeduncular nucleus in vitro. *Eur J Neurosci.* 43(7):870-84
46. Almog M, **Korngreen A.** (2016) Is realistic neuronal modeling realistic? *J Neurophysiol.* 116(5):2180-2209
47. **Korngreen A.** (2017) Visualizing fundamental neuronal computation for life science students. *Adv Physiol Educ.*41(2):312-314
48. Lavian H, Almog M, Madar R, Loewenstern Y, Bar-Gad I, Okun E, **Korngreen A.** (2017) Dopaminergic Modulation of Synaptic Integration and Firing Patterns in the Rat Entopeduncular Nucleus. *J Neurosci.* 37(30):7177-7187
49. Lavian H, Almog M, Madar R, Loewenstern Y, Bar-Gad I, Okun E, **Korngreen A.** (2018) Dopamine receptors in the rat entopeduncular nucleus *Brain Structure and function* Volume 223, Issue 6, pp 2673–2684
50. Almog M, Barkai T, Lampert A and **Korngreen A** (2018) Voltage-Gated Sodium Channels in Neocortical Pyramidal Neurons Display Cole-Moore Activation Kinetics. *Front. Cell. Neurosci.* 12:187, 1-9. doi: 10.3389/fncel.2018.00187
51. Grobman M, Dalal T, Lavian H, Shmuel R, Belevovsky K, Xu F, **Korngreen A**, Haddad R. (2018) A Mirror-Symmetric Excitatory Link Coordinates Odor Maps across Olfactory Bulbs and Enables Odor Perceptual Unity. *Neuron.* 99, 800-813
52. Gorodetski L, Zeira R, Lavian H, **Korngreen A.** (2018) Long-term plasticity of glutamatergic input from the subthalamic nucleus to the entopeduncular nucleus. *Eur J Neurosci.*, **48**, 2139-2151
53. A Faynveitz, H Lavian, A Jacob, **A Korngreen** (2019) Proliferation of inhibitory input to the Substantia Nigra in Experimental Parkinsonism *Frontiers in Cellular Neuroscience* 13, 417
54. H Lavian, A Korngreen (2019). Short-term depression shapes information transmission in a constitutively active GABAergic synapse *Scientific reports* 9 (1), 1-15
55. A Matzner, L Gorodetski, A Korngreen, I Bar-Gad (2019) Dynamic input-dependent encoding of individual basal ganglia neurons *Scientific reports* 10 (1), 1-13

56. R Schick, N Farah, A Markus, A Korngreen, Y Mandel (2020) Electrophysiologic Characterization of Developing Human Embryonic Stem Cell-Derived Photoreceptor Precursors Investigative ophthalmology & visual science 61 (11), 44-44
57. L Gorodetski, Y Loewenstern, A Faynveitz, I Bar-Gad, KT Blackwell, A Korngreen (2021) Endocannabinoids and dopamine balance basal ganglia output Frontiers in Cellular Neuroscience 15, 62
58. Roy Ben-Shalom, Alexander Ladd, Nikhil S Artherya, Christopher Cross, Kyung Geun Kim, Hersh Sanghevi, Alon Korngreen, Kristofer E Bouchard, Kevin J Bender (2022) NeuroGPU: Accelerating multi-compartment, biophysically detailed neuron simulations on GPUs Journal of neuroscience methods 366, 109400

**A. Edited Books:**

1. **Korngreen, A. (2016)** Advanced patch-clamp analysis for neuroscientists, Springer Method Series. Springer

**B. Chapters in Books:**

1. **Korngreen, A.** and Priel, Z. (1998) Mucus transporting cilia: A model system for investigating calcium signaling in electrically inexcitable cells. In: *Cilia, Mucus, and Mucociliary Interactions*. Marcel Dekker, NY, pp. 49-58.
2. Silberberg, S.D., **Korngreen, A.**, Ma, W., Uzlaner, N. and Priel, Z. (2001) Modulation of ciliary motility by Na<sup>+</sup> In: *Cilia and Mucus: From Development to respiratory defense*. Marcel Dekker, NY, pp. 81-90.
3. Angelika Lampert, and **Alon Korngreen**, Markov Modeling of Ion Channels: Implications for Understanding Disease. In Kim T. Blackwell, editor: Progress in Molecular Biology and Translational Science, Vol. 123, Burlington: Academic Press, 2014, pp. 1-21
4. Mara Almog and **Alon Korngreen** Recording and Hodgkin-Huxley Kinetic Analysis of Voltage-Gated Ion Channels in Nucleated Patches. In A. Korngreen Editor: Advanced Patch-Clamp Analysis for Neuroscientists pp 305-323