

Curriculum Vitae



Yoonkey Nam, PhD

Associate Professor, Department of Bio and Brain Engineering, KAIST

Room 1007, CHUNG Moon Soul building(E16)
291 Daehak-ro Yuseong-gu, Daejeon, 305-701, Korea

Phone: +82-42-350-4322, Fax: +82-42-350-4310

Email: ynam@kaist.ac.kr

<http://neuros.kaist.ac.kr>

RESEARCH AREAS

1. Large-scale neural recording and stimulation technology
2. Surface micro-patterning technology for neurobiology
3. Nano-neurotechnology
4. Neuron-based biosensor technology
5. Neural network dynamics
6. Neuro-Machine interface system

EDUCATION

Ph. D. University of Illinois at Urbana-Champaign, Electrical Engineering, 2005.

M.S. University of Illinois at Urbana-Champaign, Electrical Engineering, 2003.

B.S. Seoul National University, Electrical Engineering, 1997.

POSITIONS

Sept. 2013 – July 2014 **Visiting Scholar**
Department of Chemistry and Biochemistry
University of California, San Diego, CA, USA

Sept. 2010 – present **Associate Professor**
Department of Bio and Brain Engineering
Korea Advanced Institute of Science and Technology (KAIST), South Korea

Sept. 2006 – Aug. 2010 **Assistant Professor**
Department of Bio and Brain Engineering
Korea Advanced Institute of Science and Technology (KAIST), South Korea

Sept. 2005 – Aug. 2006 **Postdoctoral Research Associate**
Department of Bioengineering
University of Illinois at Urbana-Champaign, Urbana, Illinois, USA

Jan. 2000 – Aug. 2005 **Research Assistant**
Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign, Urbana, Illinois, USA

Mar. 1997 – Jun. 1999 **Korean Army**
Artillery officer (ROTC 35), South Korea

PROFESSIONAL ACTIVITIES

2015 Local Organizing Committee member of MicroTAS 2015
2008 – present Editorial board member, Journal of Biological Engineering Research
2010 – 2012 Editorial board member, IEEE Transactions on Biomedical Engineering
2010 – 2011 Chair of Academic Program Committee (Korean Society for Medical and Biological Engineering)
2012 Member of Academic Program Committee (Korean BioChip Society)

PROFESSIONAL MEMBERSHIPS

2001 – present IEEE Engineering of Medicine and Biology Society (EMBS)
2007 – present BioMedical Engineering Society (BMES)
2010 – present Society for Neuroscience (SfN)
2006 – present The Korea BioChip Society
2007 – present The Korean Society of Medical & Biological Engineering (KOSOMBE)

HONORS & AWARDS

Best Paper Award (2014) by The Korean Society of Medical & Biological Engineering (KOSOMBE)
Early Career Achievement Award (2013) by The Korea BioChip Society
Young Investigator Awards in Biomedical Engineering (2011) by KOSOMBE
Excellent Collaboration in Research (2011) by KAIST
Outstanding Lecturer (2008) by KAIST
Outstanding Lecturer (2008) by Department of Bio and Brain Engineering, KAIST

PUBLICATIONS ([PubMed Link](#))

Journal papers (*corresponding author)

1. Joo S, Kang K, Nam Y. In vitro neurite guidance effects induced by polylysine pin-stripe micropatterns with polylysine background. *J Biomed Mater Res:Part A*. (accepted)
2. Kang K, Joo S, Choi JY, Geum S, Hong S, Lee S, Kim YH, Kim S, Yoon M, Nam Y*, Lee K*, Lee H*, Choi IS*. Tissue-based metabolic labeling of polysialic acids in living primary hippocampal neurons. *PNAS*, 2015 Jan 6. doi:10.1073/pnas.1419683112. [Epub ahead of print]
3. Jang MJ, Nam Y*. Agarose-assisted micro-contact printing for high-quality biomolecular micro-patterns. *Macromol. Biosci*. 2015 Jan 3. doi: 10.1002/mabi.201400407. [Epub ahead of print]
4. Yoo S, Hong S, Choi Y, Park JH*, Nam Y*. Photothermal inhibition of neural activity with near-infrared-sensitive transducers. *ACS Nano*. 2014 Aug 26;8(8):8040-9.
5. Kim R, Joo SH, Jung H, Hong N, Nam Y*. Recent trends in microelectrode array technology for in vitro neural interface platform. *Biomedical Engineering Letters*. 2014; 4(2): 129–141. *Best Paper Award by KOSOMBE
6. Hong D, Bae K, Yoo S, Kang K, Jang B, Kim J, Kim S, Jeon S, Nam Y, Kim YG, Choi IS*. Generation of cellular micropatterns on a single-layered graphene film. *Macrocol. Biosci*. 2014 Mar;14(3):314-9.
7. Kang K, Yoon SY, Choi SE, Kim MH, Park M, Nam Y, Lee JS, Choi IS. Cytoskeletal actin dynamics are involved in pitch-dependent neurite outgrowth on bead monolayers. *Angew Chem Int Ed Engl*. 2014 Jun 10;53(24):6075-9.
8. Kim WR, Jang MJ, Joo S, Sun W*, Nam Y*. Surface-printed microdot array chips for the quantification of axonal collateral branching of a single neuron in vitro. *Lab Chip*. 2014 Feb 21;14(4):799-805.
9. Moon Y, Kim JY, Kim WR, Kim HJ, Jang MJ, Nam Y, Kim K, Kim H, Sun W*. Function of ezrin-radixin-moesin proteins in migration of subventricular zone-derived neuroblasts following traumatic brain injury. *Stem Cells*. 2013 Aug;31(8):1696-705.
10. Kim R, Hong N, Nam Y*. Gold nanograin microelectrodes for neuroelectronic interfaces. *Biotechnol J*. 2013 Feb;8(2):206-14.
11. Kang K, Lee S, Kim R, Choi IS*, Nam Y*. Electrochemically Driven, Electrode-Addressable Formation of Functionalized Polydopamine Films for Neural Interfaces. *Angew Chem Int Ed Engl*. 2012 Dec. 21;51(52): 1301-4.
12. Jang MJ, Nam Y*. Geometric effect of cell adhesive polygonal micropatterns on neuritogenesis and axon guidance. *J Neural Eng*. 2012 Aug;9(4):046019.
13. Nam Y*. Material considerations for in vitro neural interface technology. *MRS Bulletin* 2012;37:566-572.
14. Dong CY, Shin D, Joo S, Nam Y, Cho KH*. Identification of feedback loops in neural networks based on multi-step Granger causality. *Bioinformatics*. 2012 Aug 15;28(16):2146-53.

15. Jang MJ, Nam Y*. Aqueous micro-contact printing of cell-adhesive biomolecules for patterning neuronal cell cultures. *BioChip J.*,(2012) 6(2): 107-113.
16. Kang K, Choi SE, Jang HS, Cho WK, Nam Y*, Choi IS*, Lee JS*. In-Vitro Developmental Acceleration of Hippocampal Neurons on Nanostructures of Self-Assembled Silica Beads in Filopodium-Size Ranges. *Angew Chem Int Ed Engl.* 2012 Mar 19;51(12):2855-8.
17. Yoo SJ, Nam Y*. Neurons on Parafilm: Versatile elastic substrates for neuronal cell cultures. *J Neurosci Methods.* 2012 Feb 15;204(1):28-34.
18. Yoo SJ, Kim J, Lee CS, Nam Y*. Simple and Novel Three Dimensional Neuronal Cell Culture Using a Micro Mesh Scaffold. *Exp. Neurobiol.* 2001 Jun;20(2):110 - 115.
19. Lee S, Nam Y*. Automatic switching system for the impedance analysis of multichannel microelectrode arrays: limits and improvement scheme. *J. Biomed. Eng. Res.* 2011 Sept;32(3). [Korean]
20. Kang K, Choi IS*, Nam Y*. A biofunctionalization scheme for neural interfaces using polydopamine polymer. *Biomaterials.* 2011 Sep;32(27):6374-80.
21. Goo YS*, Ye JH, Lee S, Nam Y, Ryu SB, Kim KH. Retinal ganglion cell responses to voltage and current stimulation in wild-type and rd1 mouse retinas. *J Neural Eng.* 2011 Jun;8(3):035003.
22. Goyal G, Nam Y*. Neuronal micro-culture engineering by microchannel devices of cellular scale dimensions. *Biomed. Eng. Lett.* 2011;1(2):89 - 98.
23. Wheeler BC, Nam Y*. In vitro microelectrode array technology and neural recordings. *Crit Rev Biomed Eng.* 2011;39(1):45-61.
24. Oh YJ, Park SG, Kang MH, Choi JH, Nam Y, Jeong KH*. Beyond the SERS: Raman enhancement of small molecules using nanofluidic channels with localized surface plasmon resonance. *Small.* 2011 Jan 17;7(2):184-8.
25. Yook JY, Kim MJ, Son MJ, Lee S, Nam Y, Han YM, Cho YS*. Combinatorial Activin Receptor-Like Kinase/Smad and Basic Fibroblast Growth Factor Signals Stimulate the Differentiation of Human Embryonic Stem Cells into the Cardiac Lineage. *Stem Cells Dev.* 2011 Feb 17. [Epub ahead of print]
26. Cho WK, Kang K, Kang G, Jang MJ, Nam Y*, Choi IS*. Pitch-dependent acceleration of neurite outgrowth on nanostructured anodized aluminum oxide substrates. *Angew Chem Int Ed Engl.* 2010 Dec 27;49(52):10114-8.
27. Jang MJ, Namgung S, Hong S*, Nam Y*. Directional neurite growth using carbon nanotube patterned substrates as a biomimetic cue. *Nanotechnology.* 2010 Jun 11;21(23):235102.
28. Kang K, Kang G, Lee BS, Choi IS*, Nam Y*. Generation of patterned neuronal networks on cell-repellant poly(oligo(ethylene glycol) methacrylate) films. *Chem Asian J.* 2010 Aug 2;5(8):1804-9.
29. Kim JH, Kang G, Nam Y*, Choi YK*. Surface-modified microelectrode array with flake nanostructure for neural recording and stimulation. *Nanotechnology.* 2010 Feb 26;21(8):85303.
30. Jung S, Nam Y*, Lee D*. Inference of combinatorial neuronal synchrony with Bayesian networks. *J Neurosci Methods.* 2010 Jan 30;186(1):130-9.
31. Kang G, Lee JH, Lee CS, Nam Y*. Agarose microwell based neuronal micro-circuit arrays on microelectrode arrays for high throughput drug testing. *Lab Chip.* 2009 Nov 21;9(22):3236-42.
32. Dong CY, Lim J, Nam Y*, Cho KH*. Systematic analysis of synchronized oscillatory neuronal networks reveals an enrichment for coupled direct and indirect feedback motifs. *Bioinformatics.* 2009 Jul 1;25(13):1680-5.
33. Nam Y*. Neuron-on-a-Chip technology: Microelectrode Array System and Neuronal Patterning. *J. Biomed. Eng. Res.* 2009 Apr;30:103-112. [Korean, Review]
34. Hwang H, Kang G, Yeon JH, Nam Y*, Park JK*. Direct rapid prototyping of PDMS from a photomask film for micropatterning of biomolecules and cells. *Lab Chip.* 2009 Jan 7;9(1):167-70.
35. Nam Y*, Brown EA, Ross JD, Blum RA, Wheeler BC, DeWeerth SP. A retrofitted neural recording system with a novel stimulation IC to monitor early neural responses from a stimulating electrode. *J Neurosci Methods.* 2009 Mar 30;178(1):99-102.
36. Brown EA, Ross JD, Blum RA, Nam Y, Wheeler BC, DeWeerth SP*. Stimulation-artifact elimination in a multi-electrode system. *IEEE Trans. Biomed Circuits and Systems,* 2008;2(1):10 - 21.

37. Nam Y. Brain on a Chip 구현을 위한 MEA 기술의 현황과 전망. 대한전자공학회지 (IEEK Magazine), Sep. 2007. [Korean, Review article]
38. Nam Y, Brewer GJ, Wheeler BC*. Development of astroglial cells in patterned neuronal cultures. J Biomater Sci Polym Ed. 2007;18(8):1091-100.
39. Rowe L, Almasri M, Lee K, Fogleman N, Brewer GJ, Nam Y, Wheeler BC, Vukasinovic J, Glezer A, Frazier AB*. Active 3-D micro scaffold system with fluid perfusion for culturing in vitro neuronal networks. Lab Chip. 2007 Apr;7(4):475-82.
40. Nam Y, Musick K, Wheeler BC*. Application of a PDMS microstencil as a replaceable insulator toward a single-use planar microelectrode array. Biomed Microdevices. 2006 Dec;8(4):375-81.
41. Nam Y, Branch DW, Wheeler BC*. Epoxy-silane linking of biomolecules is simple and effective for patterning neuronal cultures. Biosens Bioelectron. 2006 Dec 15;22(5):589-97.
42. Nam Y, Wheeler BC*, Heuschkel MO. Neural recording and stimulation of dissociated hippocampal cultures using microfabricated three-dimensional tip electrode array. J Neurosci Methods. 2006 Sep 15;155(2):296-9.
43. Nam Y, Chang JC, Khatami D, Brewer GJ, and Wheeler BC*. Patterning to enhance the activity of cultured neuronal network. IEE Proc. - Nanobiotechnol. 2004;151(3).
44. Nam Y, Chang JC, Wheeler BC*, Brewer GJ. Gold-coated microelectrode array with thiol linked self-assembled monolayers for engineering neuronal cultures. IEEE Trans Biomed Eng. 2004 Jan;51(1):158-65.