Hansang Cho

Curriculum Vitae

Assistant Professor at Sungkyunkwan University, UNC Charlotte

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CAREER SUMMARY

A dynamic entrepreneur exploring interdisciplinary areas: nano/biosciences and bioengineering and a seasoned independent researcher utilizing engineering technologies and biological/medical knowledge with 20+ yrs of research experience in academy, government institutes, and companies.

RESEARCH INTERESTS

- Brain-on-chips for studying neurological disorders
- Organ-on-chips for studying systematic biology and cancer
- Healthcare diagnostic and environment-monitoring platforms and sensors

EDUCATION

Ph.D. Bioengineering — University of California, Berkeley (2010)
UCSF/UCB Joint Graduate Group in Bioengineering
Advisor: Prof. Luke P. Lee, PhD
Thesis: "*Biologically Inspired Microfluidics and Nanobiosensor*"

M.S. Mechanical Design & Production Engineering — Seoul National University (1998)
Advisor: Prof. Jongwon Kim, PhD
Thesis: "*Dynamic Modeling of 6 DOF Parallel Mechanisms for Machine Tool*"

B.S. Mechanical Design & Production Engineering — Seoul National University (1996)

EXPERIENCE

Sep. 2019 – present: *Assistant Professor*, Dep. Biophysics, Sungkyunkwan University, Republic of Korea

July 2017 – present: *Visiting Research Scientist* for Biomedical Institute for Global Health Research & Technology, National University of Singapore

April 2016 – present: *Graduate Faculty* for Ph.D. program of The Nanoscale Science Program, University of North Carolina at Charlotte

June 2015 – present: *Graduate Faculty* for Ph.D. program in Biological Sciences, University of North Carolina at Charlotte

Aug. 2014 – present: *Assistant Professor*, Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte, Center for Biomedical Engineering and Science

Aug. 2014 – May 2017: *Visiting Scientist*, Harvard Medical School, Massachusetts General Hospital

Sep. 2010 – Aug. 2014: *Postdoctoral Research Fellow*, Harvard Medical School, Massachusetts General Hospital, and Shriners Hospital
Field of Study: *Neurodegeneration, Inflammation*

Mar. 2007 – Aug. 2010: *Student Researcher*, Lawrence Livermore National Laboratory
Field of Study: *Spectroscopy for Bimolecular Detection*

Mar. 2007 – Aug. 2010: *Student Researcher*, Center for Biophotonics, Science and Technology at University of California, Davis (Field of Study: *Raman Spectroscopy*)

Jan. 2003 – Aug. 2005: *Research Scientist*, Korea Institute of Science and Technology
Field of Study: *BioMEMS*, Supervisor: Tae Song Kim, Ph.D.

Jan. 2000 – Jan. 2003: *Team Manager*, Biomedlab Co.
Field of Study: *Artificial Heart Division*

Mar. 1999 – Jan. 2000: *Researcher*, Biomedlab Co.
Field of Study: *Artificial Heart Division*

May 1998 – Mar. 1999: *Design Engineer*, Hyundai Motors Company

Mar. 1996 – Feb. 1997: *Research Staff*, Engineering Research Center for Advanced Control and Instrumentation, Seoul National University

HONORS and AWARDS

1. Junior Faculty Award by Association of Korean Neuroscientists (2018)
2. Seed grant by Center for Biomedical Engineering and Science (2016, 2017)
3. Targeted Research Internal Seed Program by Charlotte Research Institute (2017)
4. Mentorship for Summer Program: CRS (2015, 2016, 2017), CCS (2016), SREU (2016)
5. Cure Alzheimer's Fund awards (2015, 2016, 2017, 2018)
6. Duke Energy Special Initiatives Funding awards by Charlotte Research Institute (2014)
7. US-Korea conference 2012 young generation fellow (August 2012)
8. MGH-ORCD research fellow's poster celebration award of 'Poster of Distinction' (May 2012)
9. Korean-American professional community in biotechnology and pharmaceuticals (KASBP)-Green Cross Fellowship, invited talk (Oct. 2011)
10. The first place in the Bears Breaking Boundaries competition under the category of Neglected Diseases (2008)
11. Lawrence scholar program fellowship (former SEGREF) from Lawrence Livermore National Laboratory (Mar. 2007)
12. Fellowship supported by Intel Inc. (Sep. 2005)
13. Study Abroad Scholarship (former KGSO) by the National Institute for International Education (NIIED) (May 2005)
14. Scholarship supported by the Korea research foundation grant funded by the Korea government (MOEHRD) (April 2005)
15. Graduation with cum laude from Seoul National University (1996)

PUBLICATIONS

Journal articles (as of 07/15/2019)

1. H.-Y. Tan, Y.J. Kang, **H. Cho***, Luke P. Lee* (*:co-corresponding), "Creating Human Mini-Brain Models," accepted by *Nature Biomedical Engineering* **2019** (impact factor: 17.135)
2. J. Park, S. H. Baik, I. Mook-Jung, D. Irimia, **H. Cho**, "Neutrophil Recruitment is Mediated by Soluble Factors from Microglia during Alzheimer's Disease," accepted by *Frontiers in Immunol* **2019** (impact factor: 4.716)
3. J. Shin, M.H. Hwang, S. Back, H.G. Nam, C.M. Yoo, J.H. Park, H.G. Son, J.W. Lee, H. Lim, K.H. Lee, H. Moon, J. Kim, **H. Cho**, H. Choi "Electrical impulse effects on degenerative human annulus fibrosus model to reduce disc pain using micro-electrical impulse-on-a-chip," *Sci. Rep.* **2019**, 9:5827 (impact factor: 4.525)
4. Y.J. Kang, E.G. Cutler, **H. Cho**, "Diagnostic, Therapeutic Nanoplatforms and Delivery Strategies for Neurological Disorders," *Nano Convergence* **2018**, 5:35 (impact factor: 2.431, times cited: 3)
5. L.H. Chong, H. Li, I. Wetzel, **H. Cho**, Y.C. Toh, "A liver-immune coculture array for predicting systemic drug-induced skin sensitization," *Lab on a Chip* **2018**, 21:3239-3250 (impact factor: 6.914, times cited: 1)
6. H. Chun, I. Marriott, C.J. Lee, **H. Cho**, "Elucidating the Interactive Roles of Glia in Alzheimer's Disease Using Established and Newly Developed Experimental Models," *Frontiers in Neurology* **2018**, 9:797 (impact factor: 2.635, times cited: 4)
7. J. Park, I. Wetzel, I. Marriott, D. Dréau, C. D'Avanzo, D.Y. Kim, R.E. Tanzi, **H. Cho**, "A 3D Human Tri-Culture System Modeling Neurodegeneration and Neuroinflammation in Alzheimer's Disease," *Nature Neuroscience* **2018**, 21:941-951 (impact factor: 19.912, times cited: 37)
8. X. Du, W. Li, G. Du, **H. Cho**, M. Yu, Q. Fang, L.P. Lee, J. Fang, "Droplet Array-Based 3D Coculture System for High-Throughput Tumor Angiogenesis Assay," *Analytical Chemistry* **2018**, *90* (5):3253–3261 (impact factor: 6.35, times cited: 5)
9. J. Park, I. Wetzel, D. Dréau, **H. Cho**, "3D Miniaturization of Human Organs for Drug Discovery," *Advanced Healthcare Materials* **2018**, 7:1700551 (impact factor: 6.270, times cited: 12) *(front cover imaged)*
10. M.H. Hwang, D.H. Cho, S.M. Baek, J.W. Lee, J.H. Park, C. M. Yoo, J.H. Shin, H.G. Nam, H.G. Son, H.J. Lim, **H. Cho**, H.J. Moon, J.H. Kim, J. K. Lee, H. Choi, "Spine-on-a-chip: Human annulus fibrosus degeneration model for simulating the severity of intervertebral disc degeneration," *Biomicrofluidics* **2017**, 11:064107 (impact factor: 2.571, times cited: 2)
11. E. Reátegui, A. Khankel, B. Jalali, E. Wong, **H. Cho**, C. N. Serhan, J. Dalli, H. Elliot, D. Irimia, "Microscale arrays for the profiling of start and stop signals coordinating human-neutrophil swarming," *Nature Biomedical Engineering* **2017**, 1:0094 (times cited: 20) *(cover imaged)*
12. K.W. Bong, J.J. Kim, **H. Cho**, E. Lim, P. Doyle, D. Irimia, "Synthesis of Cell-Adhesive Anisotropic Multifunctional Particles by Stop Flow Lithography and Streptavidin-Biotin Interactions," *Langmuir* **2015**, 8:13165-13171 (impact factor: 3.683, times cited: 18)
13. **H. Cho**, J.H. Seo, K.H.K. Wong, Y. Terasaki, J. Park, K. Bong, K. Arai, E.H. Lo, D. Irimia, "Three-Dimensional Blood-Brain Barrier Model for *in vitro* Studies of Neurovascular Pathology," *Scientific Report* **2015**, 5:15222 (impact factor: 4.525, times cited: 87)
14. S. Takedaa, S. Wegmanna, **H. Cho**, S.L. DeVosa, C.Comminsa, A.D. Roea, S.B. Nicholllsa, G.A. Carlsonc, R.

Pitstickc, C.K. Nobuharaa, I. Costantinoa, M.P. Froscha, D.J. Müllerd, D. Irimiab, B.T. Hyman, "Neuronal uptake and propagation of a rare phosphorylated high-molecular-weight tau species derived from tau-transgenic mouse and human Alzheimer's disease brain," *Nature Communications* **2015**, 6:4890 (impact factor: 12.353, times cited: 101)

15. Y. Hori, S. Takeda, **H. Cho**, S. Wegmann, T. M. Shoup, K. Takahashi, D. Irimia, D.R. Elmaleh, B.T. Hyman, E. Hudry, "A Food and Drug Administration-approved Asthma Therapeutic Agent Impacts Amyloid β in the Brain in a Transgenic Model of Alzheimer Disease" *Journal of Biological Chemistry* **2015**, 290:1966-1978 (impact factor: 4.010, times cited: 38)
16. **H. Cho***, B. Hamza* (*equal contribution), E.A. Wong, D. Irimia, "On-demand, Competing Gradient Arrays for Neutrophil Chemotaxis," *Lab on a Chip* **2014**, 14:972-978 (impact factor: 6.914, times cited: 16)
17. S.H. Baik, M.-Y. Cha, Y.-M. Hyun, **H. Cho**, B. Hamza, D.K. Kim, S.-H. Han, H. Choi, K.H. Kim, M. Moon, J. Lee, M. Kim, D. Irimia, I. M.-J., "Migration of Neutrophils Targeting Amyloid Plaques in Alzheimer's Disease Mouse Model," *Neurobiology of Aging* **2014**, 35: 1286-1292 (impact factor: 4.454, times cited: 57)
18. B. Hamza, S. Patel, E. Wong, **H. Cho**, J. Martel, D. Irimia, "Retrotaxis of Human Neutrophils during Mechanical Confinement inside Microfluidic Channels," *Integrative Biology* **2014**, 6:175-183 (impact factor: 3.294, times cited: 29)
19. **H. Cho**, T. Hashimoto, E.A. Wong, L. Zhao, Y. Hori, L.B, Wood, K.M. Haigis, B.T. Hyman, D. Irimia, "Microfluidic Chemotaxis Platform for Differentiating the Distinct Roles of Soluble and Bound Amyloid-β on Microglial Accumulation," *Scientific Report* **2013**; 3:1823 (impact factor: 4.525, times cited: 40)
20. **H. Cho**, E. -C. Yeh, R. Sinha, T.A. Laurence, J.P. Bearinger, L.P. Lee, "Single-Step Nanoplasmonic $VEGF_{165}$ Aptasensor for Cancer Diagnosis," *ACS Nano* **2012**; 6:7607-7614 (impact factor: 13.903, times cited: 92)
21. C.V. Pagba, S.M. Lane, **H. Cho**, S. Wachsmann-Hogiu, "Direct Detection of Aptamer-Thrombin Binding via Surface-Enhanced Raman Spectroscopy," *Journal of Biomedical Optics* **2010**; 15:0470061-0470068 (impact factor: 2.367, times cited: 39)
22. T. Kokalj*, **H. Cho*** (*equal contribution), M. Jenko, L.P. Lee, "Biologically-Inspired Porous Cooling Membrane Using Arrayed-Droplets Evaporation," *Applied Physics Letters* **2010**; 96:163703-163705 (impact factor: 3.521, times cited: 15)
23. **H. Cho**, B. Lee, G.L. Liu, A. Agarwal, L.P. Lee, "Label Free and Highly Sensitive Biomolecular Detection Using SERS and Electrokinetic Preconcentration," *Lab on a Chip* **2009**; 9:3360-3363 (impact factor: 6.914, times cited: 116)
24. D. Choi, T. Kang, **H. Cho**, Y. Choi, L.P. Lee, "Additional Amplifications of SERS via Optofluidic CD-Based Platform," *Lab on a Chip* **2009**; 9:239-243 (impact factor: 6.914, times cited: 70)
25. **H. Cho**, B.R. Baker, S. Wachsmann-Hogiu, C.V. Pagba, T.A. Laurence, S.M. Lane, L.P. Lee, J.B.H. Tok, "Aptamer-Based SERRS Sensor for Thrombin Detection," *Nano Letters* **2008**; 8:4386–4390 (impact factor: 12.279, times cited: 181)
26. B.C. Chang, S.H. Lim, **H. Cho**, S. Lee, J.H. Lee, Y.S. Hong, Y.N. Youn, Y.H. Park, "Preclinical Test of an Electro-Mechanical Implantable Left Ventricular Assist System," *Korean Circulation Journal* **2008**; 38:7-11 (impact factor: 1.421)

27. **H. Cho**, H.Y. Kim, J.Y. Kang, T.S. Kim, "How the Capillary Burst Microvalve Works," *Journal of Colloid and Interface Science* **2007**; 306:379-385 (impact factor: 6.361, times cited: 247)
28. J.H. Kim, H.J. Shin, H.J. Cho, S.M. Kwak, **H. Cho**, T.S. Kim, J.Y. Kang, E.G. Yang, "A Microfluidic Protease Activity Assay Based on the Detection of Fluorescence Polarization," *Analytica Chimica Acta* **2006**; 577:171-177 (impact factor: 5.256, times cited: 14)
29. J.H. Lee, J.M. Jang, **H. Cho**, K.C. Han, T.S. Kim, J.Y. Kang, E.G. Yang, "Design and Characterization of Microfluidic Analysis System for RNA-Aminoglycoside Interactions," *Key Engineering Materials* **2005**; 277-279:90-95 (impact factor: 0.18)
30. **H. Cho**, H.-Y. Kim, J.-Y. Kang, S.-M. Kwak, T.-S. Kim, "Analysis and Evalution of Capillary Passive Valves in Microfluidic Systems Using a Centrifugal Force," *KIEE Int. Transact. EA* **2004**; 4:155-159 (times cited: 2)
31. W.G. Kim, W.Y. Lee, B.H. Lee, **H. Cho**, "A Simplified Cardiopulmonary Bypass Technique for Animal Experiments on Implantable Ventricular Assist Devices," *International Journal of Artificial Organs* **2002**; 25:147-50 (impact factor: 1.232)
32. **H. Cho**, W.G. Kim, W.Y. Lee, S.M. Kwak, S.S. Kim, J.K. Kim, J.T. Kim, M.H. Ryu, E.S. Ryu, K.C. Moon, B.S. Su, H.J. Yu, G.J. Yoon, H.J. Jeong, J.S. Choi, S.J. Hwang, J.W. Kim, B.G. Min, "Development and Evaluation of a Novel Electro-Mechanical Implantable Ventricular Assist System," *Journal of Biomedical Engineering Research* **2001**; 22:349-358

Under reviewed or revision

1. A. Zare, E. Cutler, **H. Cho**, "Plasmonic Hybridization to Modulate Nanospikes for High Enhancement and Wide Tunability of Electromagnetic Field," under revision for *APL*
2. H. Chun, Y.J. Kang, **H. Cho**, C. Justin Lee *et al.,* "Severe reactive astrocytes precipitate the hallmarks of Alzheimer's disease via H_2O_2," under revision for *Nature Neuroscience*
3. I.H. Wetzel, W.L. Groves, **H. Cho**, "Engineered Human Organs for Translational Medicine," under revision for *Frontiers in Bioengineering and Biotechnology*
4. A. McQuade et al, under revision for *Nature Communications*
5. **H. Cho** *et al.*, "Mechanism of Bidirectional Capillary Diodes in Xylems and Application to Brain Tumor Angiogenesis," under review by *Lab on a Chip*
6. M. Hwang et al., under review by *Osteoarthritis and Cartilage*

Conference Proceedings (14 oral presentations)

1. W. Groves, K. Rubio, I. Wetzel, **H. Cho**, "Co-axial extrusion of multicellular blood-brain barrier," TERMIS-AM Annual Conference, Orlando, FL, USA, Dec. 2-5, 2019
2. W. Groves, M. Bae, Y. Kang, J. Jang, H-G Yi, D-W Cho, **H. Cho**, "Development of Physiologically relevant Human Brain Models by Using Brain Decellularized Extracellular Matrix," the Biomedical Engineering Society Annual Meeting (BMES2019), Philadelphia, PA, USA, Oct. 16-19, 2019
3. Y.J. Kang, H. Chun, C.J. Lee, **H. Cho**, "Neurodegenerative microglial activation exacerbated by astrocytes-driven oxidative stress and proinflammation in a human Alzheimer's disease brain model," the Society for Neuroscience's 47th annual meeting (Neuroscience 2019), Chicago, IL, USA, Oct. 19-23, 2019

4. G. Ambrin, B.R. Singh, **H. Cho**, "Assessment of Adverse Neurotoxicity of BoNT/A by Using an Engineered Human Brain Model," the Society for Neuroscience's 47th annual meeting (Neuroscience 2019), Chicago, IL, USA, Oct. 19-23, 2019, (oral presentation, HOT 100s out of 14,000 abstracts)
5. H. Chun, Y. Kim, Y.J. Kang, H. Im, J.H. Shin, Y. Ju, W. Won, Y.M. Park, J. Lim, J.A. Lee, J.W. Oo, Y. Hwang, S. Jo, I.W. Etzel, J-H Park, D. Kim, D.Y. Kim, B.J. Gwag, Y. Kim, K.D. Park, B-K Kaag, **H. Cho**, H. Ryu, C.J. Lee, "Severe reactive astrocytes precipitate pathological hallmarks of Alzheimer's disease via excessive H2O2-production," the 10th World Congress of Neuroscience by International Brain Research Organization (IBRO 2019), Daegu, Korea, Sept. 21-25, 2019
6. Y. Kang, H. Chun, C.J. Lee, **H. Cho**, "Neurodegenerative Astrogliosis Mediated by Oxidative Stress in Alzheimer's Diseased Human Model," the 10th World Congress of Neuroscience by International Brain Research Organization (IBRO 2019), Daegu, Korea, Sept. 21-25, 2019
7. L.H. Chong, H. Li, I. Wetzel, **H. Cho**, Y.-C. Toh, "Liver-Immune co-culture array predicts drug-metabolism induced skin sensitization" 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2018), Kaohsiung, Taiwan, Nov. 11-15, 2018, (oral presentation)
8. J. Park, I. Wetzel, I. Marriott, D. Dréau, D.Y. Kim, R.E. Tanzi, **H. Cho**, "Reconstructed neurotoxic microglial activation triggered by reactive astrocytes in a 3d organotypic human Alzheimer's disease brain model," the Society for Neuroscience's 46th annual meeting (Neuroscience 2018), San Diego, CA, USA, Nov. 3-7, 2018 (oral presentation, selected as a Neuroscience 2018 Hot Topic)
9. I. Wetzel, **H. Cho** "Single-Step Co-Axial Extrusion (SS-CAE) for Construction of Human Blood-Brain Barrier Model in 3D," the Biomedical Engineering Society Annual Meeting (BMES2018), Atlanta, GA, USA, Oct. 17-20, 2018
10. G. Ambrin, S. Cai, B.R. Singh, **H. Cho** "Engineering Multicellular Human Brain Model and Assessing Adverse Toxicity of BoNT/A Leading to Synaptic Impairment in Alzheimer's Disease," the Biomedical Engineering Society Annual Meeting (BMES2018), Atlanta, GA, USA, Oct. 17-20, 2018
11. J. Park, I. Wetzel, S. H. Baik, I. Mook-Jung, D. Irimia, **H. Cho**, "The roles of neutrophils in the CNS mediated by reactive microglia in AD," Gordon Research Conference: Barriers of the CNS Gordon Research Conference, New London, NH, USA, June 17-22, 2018
12. J. Park, I. Wetzel, **H. Cho**, "Mimicry of Neuroinflammatory Environment in Alzheimer's Disease and Discovery of Microglial Modulation in Neutrophil Recruitment to Central Nervous System," TERMIS-AM annual conference, Charlotte, NC, USA, Dec. 3-6, 2017 (oral presentation)
13. J. Park, Ram Ganapathi, **H. Cho**, "Cooperative role of glioma and microglia migration in tumor mimicking microenvironment through the paracrine PAI-1/IL6 signaling," Annual Symposium: Charlotte Biomedical Science and Engineering, Charlotte, NC, USA, May 5, 2017 (oral presentation)
14. J. Park, D. Dréau, D. Y. Kim, R. E. Tanzi, **H. Cho**, "Neuron-Glia Interactions in 3D Organotypic Human Alzheimer's Disease Brain Model," Gordon Research Conference: Glial Biology: Functional Interactions Among Glia & Neurons, Ventura, CA, USA, Mar. 5-10, 2017
15. J. Park, D.Y. Kim, R.E. Tanzi, **H. Cho**, "Microglial Activation and Neuronal Loss on Recapitulated 3D Human 3D Alzheimer's Disease Brain Model," the Society for Neuroscience's 44th annual meeting (Neuroscience 2016),

San Diego, CA, USA, Nov. 12-16, 2016

16. E. Reátegui, A. Khankel, B. Jalali, E. Wong, **H. Cho**, C. N. Serhan, J. Dalli, H. Elliot, D. Irimia "Inter-Cellular Signals during Human Neutrophil Swarming," the Biomedical Engineering Society Annual Meeting (BMES2016), Minneapolis, WA, USA, Oct. 5-8, 2016
17. **H. Cho**, S. H. Baik, I. Mook-Jung, D. Irimia, "Neutrophil Recruitment is Mediated by Soluble Factors from Microglia during Alzheimer's Disease," Gordon Research Conference: Glial Cells in Health and Disease, Ventura, CA, USA, Mar. 1-6, 2015
18. **H. Cho**, S. H. Baik, I. Mook-Jung, D. Irimia, "Neutrophil Recruitment is Mediated by Soluble Factors from Microglia during Alzheimer's Disease," the Society for Neuroscience's 44th annual meeting (Neuroscience 2014), Washington, DC, USA, Nov. 15-19, 2014
19. **H. Cho**, J. H. Seo, K. Wong, K. Bong, Yasukazu Terasaki, K. Arai, E. H. Lo, D. Irimia, "A Tube-shaped *in vitro* Blood-Brain-Barrier Model in Planar Microfluidics," the Society for Neuroscience's 43rd annual meeting (Neuroscience 2013), San Diego, CA, USA, Nov. 9-13, 2013
20. **H. Cho**, J. H. Seo, K. Wong, K. Bong, K. Arai, E. H. Lo, D. Irimia, "A Tube-shaped *in vitro* Blood-Brain-Barrier Model in Planar Microfluidics," the Biomedical Engineering Society Annual Meeting (BMES2013), Seattle, WA, USA, Sep. 25-28, 2013 (oral presentation)
21. **H. Cho**, B. Hamza, E. Wong, D. Irimia, "Microfluidic Platform for On-Demand, Competitive, Large-Scale Chemotaxis Assays of Neutrophils," the Biomedical Engineering Society Annual Meeting (BMES2013), Seattle, WA, USA, Sep. 25-28, 2013 (oral presentation)
22. **H. Cho**, T. Hashimoto, E. Wong, B.T. Hyman, D. Irimia, "Distinct Roles of Amyloid Beta on Microglial Accumulation in Alzheimer's Disease," the Biomedical Engineering Society Annual Meeting (BMES2012), Atlanta, GA, USA, Oct. 24-27, 2012 (oral presentation)
23. **H. Cho**, T. Hashimoto, E. Wong, B.T. Hyman, D. Irimia, "*Ex vivo* Alzheimer's Disease Model Characterizing Accumulation of Microglia Cells Recruited by Soluble Amyloid Beta and Localized by Surface-Bound Amyloid Beta Fibrils," the Society for Neuroscience's 42nd annual meeting (Neuroscience 2012), New Orleans, LA, USA, Oct. 13-17, 2012
24. **H. Cho**, E. Hudrey, M. Toner, B.T. Hyman, D. Irimia, "Migration of Microglia Is Modulated by Amyloid Beta during the Progression of Alzheimer Disease," the Biomedical Engineering Society Annual Meeting, (BMES2011), Hartford, MA, USA, Oct. 12-15, 2011 (oral presentation)
25. **H. Cho**, E.C. Yeh, R. Sinha, L.P. Lee, "Aptamer-Based Nanoplasmonic $VEGF_{165}$ Sensor for Breast Cancer Diagnostics," the Biomedical Engineering Society Annual Meeting, (BMES2010), Austin, TX, USA, Oct. 6-9, 2010 (oral presentation)
26. **H. Cho**, A. Kimteng, L.P. Lee, "Bidirectional Fluidic Diode," 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2010) Groningen, the Netherlands, Oct. 3-7, 2010, (oral presentation)
27. T. Kokalj, **H. Cho**, M. Jenko, L.P. Lee, "Skin-Inspired Cooling Surface," Lab-on-a-chip European Congress, Dublin, Ireland, May 25-26, 2010
28. **H. Cho**, R. Sinha, L.P. Lee, "Real-Time and Label-Free Aptasensor of VEGF for Cancer Diagnostics," AACR

101st Annual Meeting, Washington, DC, USA, April 17-21, 2010, AACR highlighted

29. C.V. Pagba, **H. Cho**, S. Lane, S. Wachsmann-Hogiu, "Aptamer-based label-free direct detection of thrombin using SERS," The 238th ACS National Meeting, Washington, DC, USA, August 16 – 20, 2009; 237:491-491
30. **H. Cho**, Y. Zhang, B. Lee, A. Kimteng, J.P. Beringer, B.R. Baker, T.A. Laurence, S.M. Lane, L.P. Lee, "Integrated Microfluidic Platform with Nanoplasmonic Aptasensor for On-Chip Lable-Free VEGF Detection in Dynamic Tumor Microenvironment," 13th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2009), Jeju, Korea, November 1-5, 2009; 1482-1484
31. **H. Cho**, Y. Zhang, B.R. Baker, L.P. Lee, "Integrated Microfluidic Platform with Surface-Plasmonic Aptasensor for On-chip Label-free Detection of Cancer Markers from Cells," 10th Annual UC Systemwide Bioengineering Symposium, Merced, CA, USA, June 19-21, 2009 (oral presentation)
32. **H. Cho**, B.R. Baker, S. Wachsmann-Hogiu, C. Pagba, T. Laurence, S.M. Lane, L.P. Lee, J.B.H. Tok, "Detection of Thrombin by Aptamer-Based Surface Enhanced Resonance Raman Spectroscopy," 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2008), San Diego, CA, USA, October 12-16, 2008:290-292
33. D. Choi, T. Kang, **H. Cho**, Y. Choi, L.P. Lee, "SERS Signal Amplification via Biofluidic-Adsorption Preconcentration in Optofluidic CD Platform," 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2008), San Diego, CA, USA, October 12-16, 2008:964-966
34. **H. Cho**, Y.T. Long, B. Lee, L.P. Lee, "Electrokinetic SERS Signal Amplification for Label-free Biomolecular Detection," 11th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2007), Paris, France, October 7-11, 2007; 2:1182-1184 (oral presentation)
35. **H. Cho**, Y.T. Long, L.P. Lee, "Study on Biomolecules by Electrokinetic Concentration-Based SERS Amplification," Biophysical Society's 51st Annual Meeting, Baltimore, Maryland, USA, March 3-7, 2007
36. **H. Cho**, L.P. Lee, "A Novel Integrated Microfluidic SERS-CD with High-Throughput Centrifugal Cell Trapping Array for Quantitative Biomedicine," 10th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2006), Tokyo, Japan, Nov. 5 - 9, 2006; 1:642
37. **H. Cho**, J. See, L.P. Lee, "A Novel Integrated Centrifugal Cell Trapping SERS-CD Platform for Quantitative Cell Analysis," the Biomedical Engineering Society Annual Meeting (BMES2006), Chicago, IL, USA, Oct. 11-14, 2006
38. **H. Cho**, B. Kim, L.P. Lee, "Tunable Surface-Enhanced Raman Scattering Probes for Single Biomolecular Detections," Biophysical Society's 50th Annual Meeting, Salt Lake City, UT, USA, February 18-22, 2006
39. **H. Cho**, H.Y. Kim, J.Y. Kang, S.M. Park, T.S. Kim, "Modeling of Capillary Passive Valve and Fabrication Using SU-8," the 6th Conference of HARMST, Gyeongju, Korea, June 6-13, 2005; 1: PD07
40. **H. Cho**, J.Y. Kang, S.M. Kwak, K. Hwang, J. Min, J. Lee, D. Yoon, T.S. Kim, "Integration of PDMS Microfluidic Channel with Silicon-Based Electromechanical Cantilever Sensor on a CD Chip," IEEE 18th Int. Conf. on MEMS, Miami, FL, USA, March 2005; 18:698-701
41. J.Y. Kang, **H. Cho**, S.M. Kwak, D.S. Yoon, T.S. Kim, "Novel Particle Separation Using Spiral Channel and Centrifugal Force for Plasma Preparation from Whole Blood," the 8th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2004), Malmo, Sweden, Sep. 26-30, 2004; 8:614-616

42. **H. Cho**, H.Y. Kim, J.Y. Kang, T.S. Kim, "Capillary Passive Valve in Microfluidic System," the 7th Conference on Nanotech, Boston, MA, USA, March 7-11, 2004; 7:263-266
43. J.H. Lee, J.M. Jang, **H. Cho**, T. Kim, E.G. Yang, "Development of High-Throughput Screening Systems for RNA Targets Using Microfluidic Chips," International women's conference on BIEN-technology, Daejeon, Korea, Nov. 13-16, 2003:218
44. **H. Cho**, B.C. Chang, S. Kim, D. Min, G.J. Yoon, J. Kim, "Further Development of the Cylindrical Cam Type IVAD as a Clinical Model," ASAIO (American Society of Artificial Organs) J. 2002; 48:2:162
45. S.S. Cheon, **H. Cho**, M.H. Ryu, J. Kim, "Development of a Pump Output Estimation Algorithm Using Motor Current for a Pulsatile Implantable IVAD," ASAIO J 2002; 48:2:161
46. S.H. Lim, B.C. Chang, Y.S. Hong, **H. Cho**, "Preliminary Result of Thrombosis and Hemolysis in Biomedlab Implantable Ventricular Assist Device", ASAIO J 2002; 48:2:140
47. **H. Cho**, W.G. Kim, J.S. Choi, B.S. Soo, E.S. Ryu, G.J. Yoon, M.H. Ryu, J. Kim, B.G. Min, "Development of Implantable Ventricular Assist System with a Cylindrical Cam," ASAIO J 2001; 47:2:145
48. M.H. Ryu, J.S. Choi, **H. Cho**, G.J. Yoon, J. Kim, B.G. Min, "An Automatic Driving Method for a Pulsatile Implantable Ventricular Assist Device", ASAIO J 2001; 47:2:142
49. **H. Cho**, W. Kim, G.J. Yoon, M.H. Ryu, B.S. Soo, J. Kim, "Development of an implantable ventricular assist system with a double cylindrical cam," Int. J. Artificial Organs 2001; 25:2:790
50. **H. Cho**, W.W. Choi, B.S. Soo, G.J. Yoon, H.J. Yu, J.K. Kim, M.S. Kim, M.S. Park, S.M. Kwak, J. Kim, B.G. Min, "Development of a New Implantable Ventricular Assist Device," ASAIO J 2000; 46:2:204
51. **H. Cho**, K.S. Om, H.S. Lee, J.H. Chung, B.G. Min, "Flow Modeling Around Prosthetic Heart Valve Using Pressure Difference," the 4th Asia-pacific Conference on medical & biological conference, Seoul, Korea, Sep. 12-15, 1999; 4:251 (oral presentation)
52. K.S. Om, J.M. Ahn, C.Y. Park, G.J. Yun, **H. Cho**, J. Kim, Y.H. Jo, W.E. Kim, Y.N. Park, J.S. Choi, J.W. Park, S.W. Choi, W.K. Kim, and B.G. Min, "The Automatic Control of the Moving-Actuator Type Totally-Implantable Artificial Heart Using the Motor Current," the 4th Asia-pacific Conference on medical & biological engineering, Seoul, Korea, Sep. 12-15, 1999; 4:239

Books

1. S.-J. Ryu, J. W. Kim, J. C. Hwang, C. Park, **H. Cho**, K. Lee, Y. Lee, U. Cornel, F. C. Park, J. Kim, “Eclipse: an Overactuated Parallel Mechanism for Rapid Machining,” Parallel Kinematic Machines, Part of the series Advanced Manufacturing pp 441-455, 1999, Springer London
2. (reviewer) K. J. L. Burg, D. Dréau, T. Burg, “Engineering 3D Tissue Test System,” 2017 by CRC Press

INVITED TALKS (46)

2019: Indiana Univ., Indianapolis, IN, USA; Wake Forest School of Medicine, Winston-Salem, NC, USA; UC Berkeley, CA, USA; 2nd NO-Age Symposium, University of Oslo, Lørenskog, Norway, June 12, 2019; UK-Korea Neuroscience Symposium, London, UK, August 12-13, 2019 (invited speaker, scheduled); Univ. Manchester, Manchester, UK; Bio-Chip Bi-annual Conference, Jeju, Korea, Nov. 11-13 (invited speaker, scheduled);

Neuroscience and Technology Symposium, Nat'l Univ. Singapore, Nov. 25 (invited speaker, scheduled); Wednesday Seminar Series, POSTECH, Pohang, Korea (scheduled);

2018: Purdue Univ., West Lafayette, IN, USA; Sogang Univ., Seoul; Korea Institute of Science and Technology, Seoul; Seoul Nat'l Univ., Seoul; POSTECH, Pohang; Kookmin Univ., Seoul; Korea Univ., Seoul; Gachon Univ., Inchon, Korea; Johns Hopkins Univ., MD, USA; IEEE Nanomedicine, Waikiki, HI, Dec. 2-5, 2018 (invited speaker);

2017: KSBB Fall Meeting and International Symposium, Busan, Korea, Oct. 12-13, 2017 (invited speaker); 3rd Organ-on-a-Chip World Congress & 3D-Culture, Boston, MA, USA, July 10-11, 2017 (invited speaker); Wake Forest Institute for Regenerative Medicine, NC, USA; NCSU, NC, USA; Virginia Tech, VA, USA; Duke-NUS, Singapore; NUS, Singapore; Seoul Nat'l Univ. Hospital, Korea; Korean Institute of Industrial Technology, Korea; Sungkyunkwan Univ., Korea; UNC, NC, USA;

2016: National University of Singapore, Singapore; Hongik University, Seoul, Korea; Sogang University, Seoul, Korea; POSTECH, Seoul, Korea; Korea Institute of Machinery and Materials, Daejeon, Korea; KAIST, Daejeon, Korea;

2015: Draper Lab, Boston, MA, USA; Friday Seminar Series for Biological Sciences, UNCC, Charlotte, NC, USA;

2014: The Joint School of Nanoscience and Nanoengineering, Greensboro, NC, USA; Korean Institute of Industrial Technology;

2013: Seoul Nat'l Univ.; MIND seminar at Harvard Medical School;

2012: Hanyang Univ.;

2011: Korean-American professional community in biotechnology and pharmaceuticals Symposium (invited speaker); Seoul Nat'l Univ. Hospital;

2009: Seoul Nat'l Univ.;

PATENTS (20)

1. 3D AD Microfluidic brains, USA, APP. No. 15/954,972, Pub. Date: 2018.04.17
2. Mimicry of neuroinflammatory microenvironments and methods of use and manufacturing thereof, USA, APP. No. 15/670354, Pub. Date: 2017.08.07
3. Microfluidic platform and related methods and systems, USA, Pub. No. 2010/0136551, Pub. date: 2010.06.03
4. Aptamer based sensors and related methods and systems, USA, Pub. No. 2010/0105053, Pub. date: 2010.04.29
5. Method and apparatus for measuring fluorescence polarization in lab-on-a-chip, USA, Pat. No. 7427509, Registration date: 2008.09.23
6. Implantable left ventricular assist device with cylindrical cam, USA, Pat. No. 7105022, Registration date: 2006.09.12
7. Parallel mechanism for multi-machining type machining center, USA, Pat. No. 6135683, Registration date: 2000.10.24
8. Composite process type machining center and parallel mechanism structure thereof, Japan, Pub. No. 11-207549, Pub. date: 1999.03.08
9. Fluorescence polarization measurement method and apparatus for lab-on-a-chip, KOREA, Pat. No. 10-0822810-0000, Registration date: 2008.04.10

10. RNA conjugated medicines search method using micro fluid control fluorescence detection system, KOREA, Pat. No. 10-0782046-0000, Registration date: 2007.11.28
11. Cell dispersion micro fluidics chip and patch clamping lab on a chip using the same, KOREA, Pat. No. 10-0749908-0000, Registration date: 2007.08.09
12. An implantable ventricular assist device with cylindrical cam, KOREA, Pat. No. 10-0693392-0000, Registration date: 2007.03.05
13. Microfluidic chip for high-throughput distributing a cell and patch clamping lab-on-a-chip using the same, KOREA, Pat. No. 10-0644862-0000, Registration date: 2006.11.03
14. Minute particle separation method and apparatus using the centrifugal force and microfluidic channel, KOREA, Pat. No. 10-0618121-0000, Registration date: 2006.08.23
15. The micro fluidics supply oil the design method and biomaterial measuring device using the same, KOREA, Pat. No. 10-0608999-0000, Registration date: 2006.07.27
16. Implantable pulse type left ventricular assist device, KOREA, Pat. No. 10-0339822-0000, Registration date: 2002.05.24
17. Overdriving complex process type machining center, KOREA, Pat. No. 10-0266904-0000, Registration date: 2000.06.28
18. Complex process type machining center, KOREA, Pat. No. 10-0241701-0000, Registration date: 1999.11.04
19. The parallel mechanism structure for controlling the position and posture on 3D, KOREA, Pat. No. 10-0237553-0000, Registration date: 1999.10.08
20. The parallel mechanism structure for controlling the position and posture on 3D, KOREA, Pat. No. 10-0237552-0000, Registration date: 1999.10.08

PROFESSIONAL ACTIVITIES & PUBLIC SERVICES

2019	Session chair of Charlotte Biomedical Symposium, Charlotte, NC, May 10, 2019
2018	Session chair of IEEE Nanomedicine, Waikiki, HI, Dec. 2-5, 2018
2018	Session chair of Charlotte Biomedical Symposium, Charlotte, NC, May 4, 2018
2016 – present	Judge for the Charlotte Biomedical Symposium
2016	Chair of the Micro and Nano technologies track of the BMES 2016 annual meeting
2016	Judge for the 16th annual Graduate Research Symposium
2016	Organizer of 1st brain-on-chips workshop, Blowing Rock, NC, Jan. 2-8, 2016
2015 – present	Review committee member of a tenure-tracked faculty, MEES, UNC Charlotte
2015 – 2017	Committee member of Int'l conference of Bioceramics 2016
2014 – present	Thermodynamics FAIT committee member, MEES, UNC Charlotte
2014 – 2016	Committee member of Korean Association of Charlotte Scholarship Award
2013	Review committee member of MGH-ORCD research fellow's poster competition

JOURNAL EDITOR

2016 – present	Review Editor for the Frontiers Community in Neural Technology

2016 – present Editorial board member for Current Research in Nanotechnology

2016 – present Editorial board member for Journal of Engineering and Science

2016 – present Associate editor of American Journal of Nanotechnology

2016 Guest editor a Special Issue for the Stem Cells International

JOURNAL PEER REVIEW (35 manuscripts for 16 journals)

Nature Communications; Chemical Science; Advanced Science; ACS Applied Materials & Interfaces; ACS Biomaterials Science & Engineering; Applied Physics Letter; Beilstein Journal of Nanotechnology; Biomedic al Microdevices; Biomicrofluidics; iScience; Micromachines; Nanomaterials; PLOS ONE; Review of Scientif ic Instruments; Sensors; Experimental Neurobiology;

GRANT PEER REVIEW

2019 – The Netherlands Organization for Scientific Research (NOW)

2019 – Scientific Review for BNVT, National Institutes of Health

2017 – External reviewer for the 'Diagnostics, Therapies, Applied Medical Technology and Public Health' p anel of the ERC Starting Grant 2017 call, EU

2016 – Scientific Reviewer Officers (SRO) in the Early Career Reviewer (ECR) program at the Center for Scientific Review (CSR), National Institutes of Health

2016 – Grant peer review for National Centre for Replacement, Reduction and Refinement of Animals in Research (NC3R), UK

MEMBERSHIP

A member of the Society for Neuroscience in 2012 to present

A member of the Biomedical Engineering Society in 2006, 2011 to present

A member of Korean American Society in Biotech and Pharmaceuticals from 2011 to present

A member of Korean-American Scientists and Engineers Association from 2010 to present

An associate member of American Association for Cancer Research in 2010

A member of New England Bioscience Society from 2010 to present

A regular member of AAAS/Science Program for Excellence in Science from 2005 to 2009

A regular member of Biophysical Society in 2006

A regular member of Korean Life Scientists in the bay area from 2005 to present

A regular member of American Society of Artificial Organs in 2001

A regular member of Korean Society of Medical Biochemistry and Molecular Biology in 2001

A councilor of Korea Society of Medical Biological Engineering from 1999 to 2002

A regular member of IEEE Engineering in Medicine and Biology Society from 1999 to 2003, 2005

A regular member of American Society of Mechanical Engineering from 1996 to 2000

Jan. 2009 – Dec. 2009: A representative of Korean life scientists in the bay area at UC Berkeley

Mar. 1995 – Feb. 1996: A student representative of Department of Mechanical Design and Production Engineering at

Seoul National University

PUBLIC ANNOUNCEMENT: NEWSLETTER ARTICLE

- Colleague of Engineering, UNCC, June 2016
- http://engr.uncc.edu/newsletters/2016-spring-review/brain-chip-research-mimicks-brain-function
- https://www.nature.com/articles/s41593-018-0177-2 (News & View in *Nature Neuroscience*)
- https://www.nature.com/articles/s41590-018-0171-6 (Research Highlight in *Nature Immunology*)
- https://www.nature.com/articles/s41592-018-0191-z (Technology Feature in *Nature Methods*)
- https://www.alzforum.org/news/research-news/invading-microglia-unleash-neurodegeneration-3d-ad-culture
- https://eurekalert.org/pub_releases/2018-07/mgh-msi073018.php
- https://www.massgeneral.org/News/pressrelease.aspx?id=2276#.W19Z_FyUuu4.twitter
- https://www.sciencedaily.com/releases/2018/07/180730145418.htm

  http://bpod.mrc.ac.uk/archive/2018/8/14

TEACHING EXPERIENCES

- Thermodynamics-I: from Spring 2015 to 2019
- Microfluidics and Biomedical Applications: Spring 2016, Fall 2016/2017/2018
- Biomedical Manufacturing: 3D-Bioprinted Tissues: Spring 2017/2018/2019
- One semester as a teaching assistant for BioE121P (Introduction to Micro and Nanobiotechnology: BioMEMS-Bioengineering)

  Three semesters as a guest lecturer for BioE190A (Advanced Topics in Computational Bioengineering-Bioengineering: Plasmonics)