Brian(Myunghoon) Choi

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SUMMARY

✧ A self-motivated analytical chemist with expertise of various microscopies including electron microscopies (SEM and TEM), focused ion beam (FIB), and scanning probe microscopy (SPM) with 10+ years of experience of analytical method development and application instrumentation, strong communication/interpersonal skills (independent and collaborative work that resulted in 10+ peer-reviewed journal publications and 10+ regional/national/international conferences), looking for a challenging and responsible application scientist position where my proficiency of research activity in analytical chemistry, electrochemistry, materials chemistry, cellular biology and nanomaterial fabrication/characterization techniques will be utilized with implementation of nano-scaled correlative methodology that enables effective & efficient access to fundamental research

Education

✧ **Ph.D., Analytical Chemistry, GPA (3.8/4) / Indiana University, Bloomington, IN** 08/2017 ~ 03/2022
Thesis Title: Application Development for Measuring Single-Particle Electrocatalytic Activity at Facet-Controlled Gold Nanocrystals, Advisor in Major: Dr. Lane A. Baker / Advisor in minor: Dr. Xingchen Ye (Materials Chemistry)

✧ **M.S., Biotechnology (4.4/4.5), / Kyonggi University, Suwon, South Korea** 03/2007 ~ 02/2009

✧ **B.S., Biology (3.4/4.5) / Kyonggi University, Suwon, South Korea** 03/1999 ~ 02/2007

Work Experiences

✧ **Post doctorial Research Specialist | Chemistry | Texas A&M University** 04/2022 ~ present

- Designed creative, original experiments commensurate with PI's main research theme and independently conducted multidisciplinary research in the field of materials science, electrochemistry, and nanomaterial fabrication.
- Performed corresponding characterization with TEM, SEM, EDS, TIRF on nanoscale materials.
- Carried out maintenance and general upkeep of microscopes and related hardware.
- Taught new graduate students on custom microscopes including AFM, SICM, SECCM as guiding their experiments.
- Prepared manuscript and presentation for various projects and conferences.

✧ **Research and Teaching Assistant | Chemistry | Indiana University Bloomington** 08/2017 ~ 03/2022

- Learned and showed leadership proven in the application development of single nanocrystals electrocatalytic characterization and in the total 8 published papers (both first and co-authorship) during the 5 years of research.
- Constructed an innovative nanoscale electrochemistry application on a commercial SPM platform, called scanning electrochemical cell microscopy (SECCM), and validated the performance to provide trustful experimental data acquired at single nanocrystals.
- Closely worked with five graduate students in active collaborations with other research groups and led multiple projects successfully encouraging them to obtain breakthroughs during huddles of experiments.
- Faithfully implemented and facilitated the supervision from two different advisors in the collaborative work about application development for '*single-particle electrocatalytic activity measurement at facet-controlled nanocrystals*'.
- Published the result of the study in the Journal of the American Chemical Society, one of the most impactful and prestigious journals in chemistry *(Jeong, S.[#]; **Choi, M.-H.[#]**; Jagdale, G,; Zhong, Y.; Siepser, N.P.; Wang, Y.; Zhan, X.; Baker, L.A.*; and Ye, X.*, Unraveling Structural Sensitivity of CO_2 electroreduction at Facet-Defined Nanocrystals via Correlative Single-Entity and Macroelectrode Measurements. 2022, 144 (28), 12673-12680).*

✧ **Application Scientist / Product Manager | Park Systems, Suwon, South Korea** 01/2009 ~ 06/2017

- Developed and evaluated new SPM applications and Installed instruments at customer sites.
- Managed the Interface of business organizations, academic institutions, engineers, and R&D to implement clients' needs into products.
- Worked closely with clients in launching new products and providing seminar, training on new applications.
- Provided client demonstrations, application notes, webinars, and conference presentations to deliver product features and aid sales & marketing needs.
- Managed all key accounts (50+) and supported pre-sales and post-sales activities in worldwide.
- Performed in situ topography imaging and measured local mechanical property of soft- and biological materials with AFM for instance hydrogel, collagen, conductive polymers, and biological molecules and living cells.

✧ **Laboratory (Lab. Manager, Researcher)** 09/2005 ~ 02/2009

- Carried out many research projects, given by Ministry of Environment Republic of Korea
- Trained experimental skills and instruments to undergraduate and graduate students

Analytical Skills in Materials Characterization

✧ Characterization and manipulation of nano-materials with TEM, SEM, FIB-SEM, EDS, EBSD, XPS, FT-IR, TIRF.
✧ Surface roughness, mechanical property, and in situ topography of soft and hard materials by AFM.
✧ Electrical property characterization of nano-, 2D-, semiconductor materials with KPFM and I-AFM.
✧ Nanoscale chemical composition analysis by IR-AFM.

- ✧ Nanoscale electrochemical catalytic activity measurement of nanoparticle (crystal) with SECCM.
- ✧ Carbon-ultramicroelectrode fabrication by pyrolysis and FIB-SEM.
- ✧ Semiconductor device process and manufacturing training course (2016, Korea Advanced Nano Fab Center).
- ✧ Comsol simulation, python, Matlab / SOLIDWORKS (3D CAD) training course (2012, Ajou University).
- ✧ Business marketing plan and Practice (2014, 2015, Korea Management Association).

Seminar & Scientific Talk

- ✧ **Choi, M.-H.**; Siepser, N. P.; Jeong, S.J.; Wang, Y.; Jagdale, G.S.; Ye, X.; Baker, L. A., *National Institute of Standard and Technology (NIST)*, **2022**
- ✧ **Choi, M.-H.**; Siepser, N. P.; Jeong, S.J.; Wang, Y.; Jagdale, G.S.; Ye, X.; Baker, L. A., *Nano Scientific Symposium*, **2020**
- ✧ **Choi, M.-H.**; Jung, G.-E.; Cho, Y.-S.; Park, S.-I.; Cho, S.-J., *Stanford Nano Shared Facilities Workshop*, *Stanford University* and *American Chemical Society meeting* (San Diego), **2015**
- ✧ **Choi, M.-H.**; Jung, G.-E.; Park, S.-I.; Cho, S.-J., *Korean Society of Microscopy* and *Harvard University*, **2013**
- ✧ **Choi, M.-H.**; Jung, G.-E.; Cho, Y.-S.; Park, S.-I.; Cho, S.-J., *European Material Research Society*, **2012**

Publications

- ✧ Jeong, S.J.[#], **Choi, M.-H.**[#], Jagdale, G. S., Zhong, Y., Siepser, N. P., Wang, Y., Zhan, X., Baker, L. A., and Ye, X. Unraveling the Structural Sensitivity of CO_2 Electroreduction at Facet-Defined Nanocrystals via Correlative Single-Entity and Macroelectrode Measurements. *J. Am. Chem. Soc.* **2022**, *144* (28), 12673-12680.
- ✧ Siepser, N.P.; **Choi, M.-H**; Alden, S.E.; Baker L.A. Single-Entity Electrocatalysis at Electrode Ensembles Prepared by Template Synthesis. *J. Electrochem. Soc.* **2021***, 168,* 126526.
- ✧ **Choi, M.-H.;** Leasor C.W.; Baker, L.A. Analytical Applications of Scanning Ion Conductance Microscopy: Measuring Ions and Electrons. *Bioanalytical Reviews* **2021**, Springer (Bookchapter)
- ✧ Jagdale, G. S.; **Choi, M.-H.**; Siepser, N. P.; Jeong, S. J.; Wang, Y.; Skalla, R. X.; Huang, K.; Ye, X.; Baker, L. A., Electrospray Deposition for Single Nanoparticle Studies. *Anal. Methods* **2021**, *13*, 4105-4113.
- ✧ **Choi, M.-H.**; Jeong, S.-J.; Wang, Y.; Cho, S.-J.; Park, S.-I.; Ye, X. C.; Baker, L. A., Characterization of Ligand Adsorption at Individual Gold Nanocubes. *Langmuir* **2021**, *37*, 7701-7711.
- ✧ **Choi, M.-H.**; Siepser, N.P.; Jeong, S.J.; Wang, Y.; Jagdale, G.; Ye, X.; Baker, L.A. Probing single-particle electrocatalytic activity at facet-controlled gold nanocrystals. *Nano Lett.* **2020**, *20* (2), 1233-1239.
- ✧ Alden, S.E.; Siepser, N.P.; Patterson, J.A., Jagdale, G.; **Choi, M.-H.** and Baker, L.A. Array Microcell Method (AMCM) for Serial Electroanalysis. *ChemElectroChem* **2020**, *7*, 1-9.
- ✧ **Choi, M.-H.**; Baker, L. A. Biphasic-Scanning Ion Conductance Microscopy *Anal. Chem.* **2018**, *90*, 11797−11801.
- ✧ Zhu, Ch.; Zhou, L.; **Choi, M.-H.**; Baker, L. A. Mapping surface charge of individual microdomains with scanning ion conductance microscopy. *ChemElectroChem* **2018**, *5*, 2986-2990.
- ✧ Kim, J.h.; **Choi, M.-H.**; Jung, G.-E.; Abdul Rahim F.; Cho, N.-J.; Cho, S.-J. Dimensional comparison between amplitude-modulation atomic force microscopy and scanning ion conductance microscopy of biological samples. *Jpn. J. Appl. Phys* **2016**, *55*, 8S1.
- ✧ Mizutani, Y.; **Choi, M.-H.**; Cho, S.-J.; Okajima, T. Nanoscale fluctuations on epithelial cell surfaces investigated by scanning ion conductance microscopy. *Appl. Phys. Lett.* **2013**, *102*, 173703.
- ✧ Ushiki, T.; Nakajima, M.; **Choi, M.-H.**; Cho, S.-J.; Iwata, F. Scanning ion conductance microscopy for imaging biological samples in liquid: A comparative study with atomic force microscopy and scanning electron microscopy. *Micron,* **2012**, *43*, 1390.

Awards

- ✧ Poster Prize: *The Next Generation Nano-electrochemistry Faraday Discussion* 2021
- ✧ Microscopy award: oral presentation in *Nano Scientific Symposium*, given to one of attendees who showed significant achievement for nanoscale research with scanning probe microscopy (SPM) 2020
- ✧ C500 award: an outstanding graduate student in the first year of *Ph. D course* 2019

Service and Other Activities

- ✧ Counselor at Camp Canonicus, Rhode Island, U.S. 06~09/2005,2006
- ✧ Worked at the HyangLym-Won as a specialty counselor 02/2006 ~ 03/2009
- ✧ President of the Gwang-Ju Rotaract service group 02/2006 ~ 12/2006
- ✧ Worked at an orphanage as a counselor 03/2000 ~ 06/2000
- ✧ Cheer Leader in University 03/1999 ~12/2000

Millitary Service

- ✧ South Korea Army as a calculator in Fire Direction Center (FDC) for 4.2-inch motor 06/2001 ~ 07/2003

I hereby declare that all the above information is correct and accurate.

Brian(Myunghoon) Choi

Jan. 09. 2022