OMB No. 0925-0001 and 0925-0002 (Rev. 12/2020 Approved Through 02/28/2023)

BIOGRAPHICAL SKETCH

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NAME: Eun Joo Kim

eRA COMMONS USER NAME (credential, e.g., agency login): EUNJOO.KIM

POSITION TITLE: Postdoctoral Fellow

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Start DateMM/YYYY | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- | --- |
| Sangmyung University, Seoul, Korea | B.S. | 03/1996 | 02/2000 | Biology |
| Korea Research Institute of bioscience and Biotechnology (KREBB) Yonsei University, Seoul, Korea | M.S | 06/200003/2003 | 07/200202/2005 | BiologyNeuroscience |
| Yonsei University, Seoul, Korea Texas A&M university, College Station, TX | Ph.D. course work onlyPh.D | 03/200507/2010 | 07/200712/2017 | NeuroscienceColon cancer |
| University of Colorado Denver, Anschutz Medical Campus, Aurora, CO | Postdoc Fellow | 02/2018 | Present | Lung injury and repair/ regeneration |

**A. Personal Statement**

I have the expertise, leadership, training, expertise and motivation necessary to successfully carry out the proposed research project. I have a broad background in biology, with specific training and expertise in molecular biology and cell biology aspects of pulmonary disease, cancer and neurodegenerative disorders. Majority of my research has focused on stem cell/progenitor cell responses to external cues in various tissues and diseases. As a research assistant at the Korea Research Institute of Bioscience and Biotechnology (KREBB), I was exposed to molecular and cell biology, which led me to complete a master’s degree. I characterized the molecular mechanism leading to intracellular -synuclein aggregate formation, a major component if Lewy bodies found in Parkinson’s disease and Down syndrome during my master’s degree. During 2007 - 2010 my career was on pause due to family obligations. However, upon returning to the field as a PhD student in colon cancer, I quickly become proficient with my research projects and collaborations, and I successfully completed the PhD program. As a part of my PhD thesis work, I laid the groundwork for the research by establishing the dose of dietary bioactive n−3 PUFA and curcumin to reduce the number of damaged adult stem cell in mouse models as well its human equivalent dose that can be utilized in future human colon cancer clinical trials. I successfully administered the projects, collaborated with other researchers, and produced several peer-reviewed publications from each project. As a result of these experiences, I am aware of the importance of frequent communication among project members and of constructing a realistic research plan, timeline, and budget. Since I joined the Schwartz/Yang laboratory as a post-doctoral fellow in February 2018, I have distinguished myself in the laboratory, having completed several projects related to the investigation of ciliogenesis and mucociliary clearance in pulmonary fibrosis. I have generated a significant amount of high-quality preliminary data for this proposal and have two first-author publications currently under review. One example that demonstrates my abilities and initiative is the establishment of 3D airway-derived organoid cultures in the Schwartz/Yang laboratory to complement the 2D air-liquid interface (ALI) culture system that was already in place. I am also dedicated to fostering and encouraging students in their science, technology, engineering, and math (STEM) careers pursuits and have mentored four undergraduate students in my four years in the Schwartz/Yang lab.

Ongoing and recently completed projects that I would like to highlight include:

**CO-M-22-81 (PI: Kim; Mentors: Yang, Dobrinskikh)** 05/01/2022-04/30/2023

Colorado Clinical and Translational Sciences Institute (CCTSI)

The influence of primary cilia and Hedgehog signaling in airway epithelia on fibroproliferation.

The goal of this pilot grant award is to collect preliminary data on the role of Hedgehog signaling in the primary cilium on fibroproliferation.

**F32HL154666 (PI: Kim; Mentor: Yang)** 01/01/2021-06/30/2023

NIH/NHLBI

The role of Multiciliated Cell Dysfunction in Pathogenesis of IPF

We propose to study the potential of a newly identified multiciliated cell population with cilia abnormalities as a risk factor that contributes to decreased mucociliary clearance and pathogenesis of IPF.

**T32HL007085 (PI: Schwartz, Hanson, Petrache)** 07/01/1975-06/30/2025

Multidisciplinary Research and Training in Respiratory Disease

I was awarded a spot on the Pulmonary T32 for 07/01/2020-06/30/2021 but I terminated early (12/31/2020) to accept my F32 funding.

 **B. Positions, Scientific Appointments, and Honors**

### Positions and Employment

|  |  |
| --- | --- |
| 2000 - 2002 | NMR (Nuclear Magnetic Resonance) operator, Korea Research Institute of bioscience and Biotechnology (KREBB) |
| 2003 - 2005 | Graduate Research Assistant – Yonsei University, Seoul, Korea |
| 2005 - 2007 | Graduate Teaching Assistant – Yonsei University, Seoul, Korea |
| 2010 - 2012 | Graduate Teaching Assistant – Texas A&M University, Texas, USA |
| 2012 - 2017 | Graduate Research Assistant – Texas A&M University, Texas, USA |
| 2018 - Present | Postdoctoral Researcher, University of Colorado Anschutz Medical Campus, Colorado, USA |

### ****Scientific Appointments****

|  |  |
| --- | --- |
| 2012 - 2017 | Member – American Society for Nutrition |
| 2015 - Present | Member – Sigma Xi |
| 2018 - Present | Member – University of Colorado Postdoctoral Association |
| 2019 - Present | Member – Colorado Clinical and Translational Science Institute (CCTSI) |

### Honors

|  |  |
| --- | --- |
| 2006 | Scholarship for excellent student |
| 2006 - 2007 | BK21 Scholarship |
| 2013 | Travel Grant – ORGS 2013, ISSCR |
| 2015 | Travel Grant – SIGMA Xi |
| 2016202020212022 | 1st place at Nutrition Research SymposiumColorado Multidisciplinary Research Training in Respiratory Disease Training Grant (T32HL007085)Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (F32HL154666)CCTSI Pilot Grant Award (CO-M-22-81) |

**C. Contributions to Science**

**1. Early career**: My early career contributions during Master’s degree were focused on identifying the molecular mechanisms leading to Lewy bodies (LB) formation in Down Syndrome (DS) patients. My particular role in the project was to test whether dual specificity tyrosine-regulated kinase-1A (Dyrk1A) which is responsible for the DS neurological defects, directly phosphorylate -synuclein, a major component of LB, and affects cytoplasmic inclusion formation in hippocampal neuroprogenitor cells.

1. **Eun Joo Kim**, Jee Young Sung, Hyun Jung Lee, Hyewhon Rhim, Masato Hasegawa, Takeshi Iwatsubo, Do Sic Min, Jongsun Kim, Seung R. Paik, and Kwang Chul Chung. Dyrk1A phosphorylates alpha-synuclein and enhances intracellular inclusion formation. J Biol Chem. (2006) 281:33250-33257. PMID: 16959772
2. Jung Bum Park, **Eun Joo Kim**, Soo Ryun Seo, and Kwang Chul Chung. JNK- and Rac1-dependent induction of immediate early gene pip92 suppresses neuronal differentiation. J. Neurochem. (2007) 100: 555-566. PMID: 17156131

**2. Graduate career**: My graduate research contributions focused on combined chemo-protective effect of dietary compounds on colonic adult stem cells in part by modulating signaling pathways and plasma membrane structure. Results from my research provided cogent rationale for translating the observed synergistic chemo-protective effects of dietary components to a clinical human colon cancer trial. A subsequent publication, in which I characterized altered plasma membrane structure in colon cancer, challenged a key paradigm that select dietary agents, e.g., n − 3 PUFA, curcumin, procyanidins, will reduce oncogenic signaling and cancer risk by altering cell membrane nanoscale assemblies, protein spatial localization and signaling,

1. Robert S. Chapkin, Vanessa DeClercq, **Eunjoo Kim**, Natividad Roberto Fuentes and Yang-Yi Fan. Mechanisms by Which Pleiotropic Amphiphilic n−3 PUFA Reduce Colon Cancer Risk. Current Colorectal Cancer Reports. (2014) 10:442-452. PMID: 25400530
2. Karen Triff, **Eunjoo Kim** and Robert S. Chapkin. Chemoprotective epigenetic mechanisms in a colorectal cancer model: Modulation by n-3 PUFA in combination with fermentable fiber. Curr Pharmacol Rep. (2015) 1:11-20. PMID: 25938013
3. Laurie A. Davidson, Evelyn Callaway, **Eunjoo Kim**, Brad R. Weeks, Clinton D. Allred and Robert S. Chapkin. Targeted deletion of p53 in stem cells promotes colon tumorigenesis in a preclinical model of colitis-associated cancer. Cancer research. (2015) 75:5392-5397. PMID: 26631266
4. Manasvi S Shah1, **Eunjoo Kim**1, Laurie A Davidson, Jason M Knight, Roger S Zoh, Jennifer S Goldsby, Evelyn S Callaway, Beyian Zhou, Ivan Ivanov and Robert S. Chapkin. Comparative effects of diet and carcinogen on microRNA expression in the stem cell niche of the mouse colonic crypt. Biochim Biophys Acta. (2016) 1862:121-134. PMID: 26493444
5. Manasvi S Shah1, **Eunjoo Kim** 1, Laurie A Davidson, Jason M Knight, Roger S Zoh, Jennifer S Goldsby, Evelyn S Callaway, Beyian Zhou, Ivan Ivanov and Robert S. Chapkin. Data describing the effects of dietary bioactive agents on colonic stem cell microRNA and mRNA expression. Data Brief. (2016) 6:398-404. PMID: 26862588
6. **Eunjoo Kim**, Laurie A. Davidson, Roger S. Zoh, Bhimanagouda S. Patil, Guddadarangavvanahally K. Jayaprakasha, Evelyn S. Callaway, Clinton D. Allred, Nancy D. Turner and Robert S. Chapkin. Homeostatic responses of colonic LGR5 stem cells following acute in vivo exposure to a genotoxic carcinogen. Carcinogenesis. (2016) 37:206-214. PMID: 26717997
7. Tim Y. Hou, Laurie A. Davidson, **Eunjoo Kim**, Natividad Roberto Fuentes, Karen Triff and Robert S. Chapkin. Nutrient-gene interaction in colon cancer, from the membrane to cellular physiology. Annu Rev Nutr. (2016) 36:16.1-16.28. PMID: 27431370
8. **Eunjoo Kim**, Laurie A. Davidson, Roger S. Zoh, Martha E. Hensel, Michael L. Salinas, Bhimanagouda S. Patil, Guddadarangavvanahally K. Jayaprakasha, Evelyn S. Callaway, Clinton D. Allred, Nancy D. Turner, Brad Weeks, and Robert S. Chapkin. Rapidly cycling Lgr5+ stem cells are exquisitely sensitive to extrinsic dietary factors that modulate colon cancer risk. Cell Death Dis. (2016) 7(11):e2460. PMID: 27831561
9. Natividad R. Fuentes, Michael L. Salinas, **Eunjoo Kim** and Robert S. Chapkin. Emerging role of chemoprotective agents in the dynamic shaping of plasma membrane organization. Biochim Biophys Acta Biomembr. (2017) 1859(9 Pt B):1668-1678. PMID: 28342710
10. Natividad R. Fuentes, **Eunjoo Kim**, Yang-Yi Fan and Robert S. Chapkin. Omega-3 fatty acids, membrane remodeling and cancer prevention. Mol Aspects Med. (2018) 64:79-91. PMID: 29627343
11. **Eunjoo Kim**, Gus A. Wright, Roger S. Zoh, Bhimanagouda S. Patil, Guddadarangavvanahally K. Jayaprakasha, Evelyn S. Callaway, Ivan Ivanov, Nancy D. Turner and Robert S. Chapkin. Establishment of a multicomponent dietary bioactive human equivalent dose to delete damaged Lgr5+ stem cells using a mouse colon tumor initiation model. Eur J Cancer Prev. (2019) 28:383-389. PMID: 30234553
12. A. Erazo-Oliveras, M. Mlih, M. Muñoz-Vega, **Eunjoo Kim**, R.C. Wright, M.L. Salinas, X. Wang, J. Roper, K. Landrock, J. Karpac and R.S. Chapkin. *Orthogonal model analyses reveal a novel role of mutant APC in reshaping cholesterol-dependent Wnt nanocluster structure-function and feedforward amplification of oncogenic β-catenin*. (*Nature Communications, under review*)

**3. Postdoctoral career**: As a postdoctoral fellow, my research has provided a compelling link between aberrant motile-ciliogenesis and Muc5B in protein levels in Idiopathic Pulmonary Fibrosis (IPF) animal model. This work builds on Dr. Yang’s discovery of molecular subtypes of IPF defined by differences in expression of genes involved in ciliogenesis, as well as MUC5B, the strongest genetic risk factor for IPF, and keratin-5, a marker of basal cell in the lung airway epithelium. Currently, I am in the process of establishing recently published protocol for long-term expanding human airway organoids for IPF disease modeling in the lab to complement standard air-liquid interface (ALI) culture.

1. **Eunjoo Kim** and Ivana V. Yang. Selective regulation of the airway mucin MUC5B in the distal airway. AM J Respir Crit Care Med. (2019) 200:129-131. PMID: 31046398
2. **Eunjoo Kim**, Susan K. Mathai, Ian T. Stancil, Xiaoqian Ma, Ashley Hernandez-Gutierrez, Jessica N. Becerra, Emilette M. Torres, Corrine E. Hennessy, Kristina Hatakka, Eric P. Wartchow, Alani Estrella, Jonathan P. Huber, Jonathan H. Cardwell, Ellen L. Burnham, Yingze Zhang, Christopher M. Evans, Eszter K. Vladar, David A. Schwartz, Evgenia Dobrinskikh, Ivana V. Yang. Aberrant multiciliogenesis in Idiopathic pulmonary fibrosis. AM J Respir Cell Mol Biol. (2022) 67: 188-200 PMID:35608953
3. Evgenia Dobrinskikh\*, Corinne E. Hennessy\*, **Eunjoo Kim**\*, Jonathan S. Kurche\*, Alani M. Estrella, Jonathan Cardwell, Ivana V. Yang, David A. Schwartz. MUC5B expression augments epithelial ER stress and pulmonary fibrosis. (\* shared first authors, *European Respiratory Journal,* *under review*)

**Complete List of Published Work:** <https://www.ncbi.nlm.nih.gov/myncbi/1J3Kqt6os3KAk/bibliography/public/>