

# Curriculum Vitae

(Last updated: 9/11/2019)

## Dongwon Kim, Ph.D.

Assistant Professor  
Department of Biochemical Engineering  
College of Applied Science  
Dongseo University  
Busan, South Korea

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### Education

1996 - 2003                      Korea University, Republic of Korea (BS degree in Biotechnology)  
2003 - 2005                      Yonsei University, Republic of Korea (MS degree in Biochemistry)  
    Advisor: Dr. Seungsoo Kim  
2008 - 2014                      The Pennsylvania State University, University Park, USA  
    (PhD degree in Cell and Developmental Biology), Advisor: Dr. Alan L. Johnson

### Research/Professional Experience

#### **Post-doctoral research fellow in Department of Dermatology, Johns Hopkins School of Medicine (2014~present); PI: Luis A. Garza, MD-PhD**

I worked on 1) how site-specific skin identity is maintained and 2) how damaged tissues are regenerated. I studied about the characteristics of palmo-plantar skin and published KERATIN9 is a unique marker and is regulated by WNT/ $\beta$ -catenin signaling from fibroblasts of palmo-plantar skin. Besides, I investigated the regulatory mechanism of non-coding double stranded RNA (dsRNA) and TLR3 in regeneration and discovered that damage-induced dsRNA/TLR3 signaling stimulates intrinsic retinoic acid synthesis and signaling to control regeneration.

#### **Ph.D. research at the Pennsylvania State University (2008-2014); PI: Alan L. Johnson, PhD**

My thesis is about understanding the mechanisms of follicle selection in granulosa cells of ovarian follicles and discovered that G-protein coupled receptors (FSHR and VIP receptor) are desensitized by  $\beta$ -arrestin prior to follicle selection.

#### **Researcher at R&D team in Peptron, Inc., Republic of Korea (2004-2007)**

My major job is to develop and evaluate in vitro efficacy of peptide-derived physiological materials for anti-angiogenesis, embryonic stem cell differentiation, peptide adjuvant, anti-wrinkle formation and anti-alopecia.

### Grant

#### **Maryland Stem Cell Research Fund 2017-MSCRFF-3905 (June 2017-June 2019) \$130,000**

This 2-year grant supports the post-doctoral fellow salary to investigate the mechanism of site-specific skin identity using autologous mesenchymal stem cells.

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## Publications

1. Specimen collection for translational studies in Hidradenitis Suppurative. Byrd AS, Dina Y, Okoh UJ, Quartey QQ, Carmona-Rivera C, Williams DW, Kerns ML, Miller RJ, Petukhova L, Naik HB, Barnes LA, Shipman WD, Caffrey JA, Sacks JM, Milner SM, Aliu O, Broderick KP, Kim D, Liu H, Dillen CA, Ahn R, Frew JW, Kaplan MJ, Kang S, Garza LA, Miller LS, Alavi A, Lowes MA, Okoye GA. *Scientific Report* 2019; (1):12207
2. Noncoding dsRNA induces retinoic acid synthesis to stimulate hair follicle regeneration via TLR3. **Kim D**<sup>†</sup>, Chen R, Sheu M, Kim N, Kim S, Islam N, Wier EM, Wang G, Li A, Park A, Son W, Evans B, Yu V, Prizmic VP, Oh E, Wang Z, Yu J, Huang W, Archer NK, Hu Z, Clemetson N, Nelson AM, Chien A, Okoye GA, Miller LS, Chiaur G, Kang S, Jones JW, Kane MA, Garza LA<sup>†</sup>. *Nature Communications* 2019; 10(1):2811. (**†First author and Co-corresponding author**)
3. Hypothesis Letter: Wound-induced TLR3 activation stimulates endogenous retinoic acid synthesis and signaling during regeneration. **Kim D** and Garza LA. *Experimental Dermatology* 2019; 28(4): 450-452.
4. Simple cell culture media expansion of primary mouse keratinocytes. Kim S, Kim BW, Prizmic VP, Oh E, Yu V, **Kim D**<sup>†</sup>, Garza LA<sup>†</sup>. *Journal of Dermatol Science*. 2019;93(2):135-138. (**†Co-corresponding author**)
5. dsRNA sensing induces loss of cell identity. Zhou R\*, Wang G\*, **Kim D**\*, Kim S, Islam N, Garza LA. *Journal of Investigative Dermatology* 2019; 139(1):91-99. (**\*Co-first author**) ; *Commentary paper on this: Journal of Investigative Dermatology* 2019; 139(1):17-19
6. Injury, dysbiosis, and filaggrin deficiency drive skin inflammation through keratinocytes IL1- $\alpha$  release. Archer NK, Jo JH, Lee SK, **Kim D**, Smith B, Ortines RV, Wang Y, Marchitto MC, Ravipati A, Cai SS, Dillen CA, Liu H, Miller RJ, Ashbaugh AG, Uppal AS, Oyoshi MK, Malhotra N, Hoff S, Garza LA, Kong HH, Serge JA, Geha RS, Miller LS. *Journal of Allergy and Clinical Immunology*. 2018; 6749(18):31295-8.
7. Differentiation of Hen Granulosa Cells from Prehierarchical Follicles Following the Initiation of Follicle Stimulating Hormone Receptor Signaling. **Kim D** and Johnson AL. *Molecular Reproduction and Development* 2018;85(8-9):729-737. (**First author**)
8. Regulation of vasoactive intestinal peptide receptor (VPAC) signaling in undifferentiated hen granulosa cells. **Kim D** and Johnson AL. *Molecular Reproduction and Development* 2018;85(12):890-892. (**First author**)
9. **Commentary**; The negative regulator CXXC5: Making WNT look a little less disheveled. **Kim D** and Garza LA. *Journal of Investigative Dermatology* 2017; 137(11): 2248-2250.
10. To control site-specific skin gene expression, autocrine mimics paracrine canonical Wnt signaling and is activated ectopically in skin disease. **Kim D**, Hossain MZ, Nieves A, Gu L, Yang NB, Oh SM, Park A, Han S, Ratliff TS, Qi J, Taube JM, Kang S and Garza LA. *American Journal of Pathology* 2016; 186(5):1140-50. (**First author**)
11. Vascular endothelial growth factor and angiopoietins during hen ovarian follicle development. **Kim D**, Lee J, Johnson AL. *General and Comparative Endocrinology* 2016; 232:25-31. (**First author**)

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12. Vasoactive intestinal peptide promotes differentiation and clock gene expression in granulosa cells from preantral follicles. **Kim D**, Johnson AL. *Molecular Reproduction and Development* 2016; 83(5): 455-63. **(First author)**
13. TLR3 activation links tissue damage to epimorphic regeneration in the skin. Nelson AM, Reddy SK, Ratliff TS, Zhu AS, Hossain MZ, Kateseff AS, Chang E, Resnik SR, Page C, **Kim D**, Whittam AJ, Miller LS, Garza LA. *Cell Stem Cell* 2015; 17(2):139-51.
14. **Commentary**; A new target for squamous cancer cells? **Kim D**, Garza LA. *Experimental Dermatology* 2015; 24(1): 14-15.
15. Bone Morphogenetic Protein 4 (BMP4) supports the initial differentiation of hen (*Gallus gallus*) granulosa cells. **Kim D**, Ocón-Grove OM, Johnson AL. *Biology of Reproduction* 2013; 88(6):161. **(First author)**
16. SDF-1/CXCR4 signaling is required for maintenance of spermatogonial stem cell. Yang QE, **Kim D**, Kaucher AV, Oatley MJ, Oatley JM. *Journal of Cell Science*. 2013; 126:1009-1020.
17. Design and efficient synthesis of novel ascorbyl conjugated peptide with high collagen biosynthesis stimulating effects. Choi H, Kim H, Park J, Shin E, **Kim D**, Kim S. *Bioorganic & Medicinal Chemistry Letters*. 2009 ;19(7):2079-2082.
18. A novel L-ascorbic acid and peptide conjugate with increased stability and collagen biosynthesis. Choi H, Park J, Kim H, **Kim D**, Kim S. *BMB Reports*. 2009;42(11):743-746.
19. Structure-activity relationships of the human prothrombin kringle-2 peptide derivative NSA9: anti-proliferative activity and cellular internalization. Hwang H, **Kim D**, Kim S. *Biochemical Journal*. 2006 ;395(1):165-172.

### Awards and Honors

1. *Cornelia Post Channing New Investigator Award* (45<sup>th</sup> Meeting of the Society for the Study of Reproduction 2012)
2. Graduate Student Travel Award from The College of Agricultural Science (2013)
3. *Larry Ewing Memorial Trainee Travel Fund* (LEMTTF) from Society for the Study of Reproduction (2013)
4. Student Research/Fellow Travel Award from the Society for Investigative Dermatology (2015)
5. *Excellent Researcher Award* from Department of Dermatology, Johns Hopkins School of Medicine (2015)
6. *Paul R. Bergstresser Travel Award* from the Society for Investigative Dermatology (2016)
7. Student Research/Fellow Travel Award from the Society for Investigative Dermatology (2017)
8. Student Travel Award from Korean-American Scientists and Engineers Association (KSEA), UKC-2017 (2017)
9. Poster Award (3rd place) from Korean-American Scientists and Engineers Association (KSEA), UKC-2017 (2017)
10. Student Research/Fellow Travel Award from the International Investigative Dermatology (2018)
11. Student Travel Award from Korean-American Scientists and Engineers Association (KSEA), UKC-2018 (2018)
12. Poster Award (3rd place) from Korean-American Scientists and Engineers Association (KSEA), UKC-2018 (2018)

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13. *Stanford I. Lamberg Best Research Presentation Award from Department of Dermatology, Johns Hopkins School of Medicine (2018)*
14. *Albert M. Kligman Travel Award* from the Society for Investigative Dermatology (2019)

## Teaching experience

### Teaching Assistant

1. Biochemistry and Laboratory Class, Yonsei University, 2003-2004

### Undergraduate student mentoring

1. Seungmi Lucy Oh (Biomedical engineering, Johns Hopkins University); 2014-2015  
*Current affiliation: Medical student at Albert Einstein College of Medicine*
2. Seunghyun Han (Molecular cell biology, Johns Hopkins University); 2014-2016  
*Current affiliation: Medical student at Catholic University School of Medicine, South Korea*
3. Alexis Hood (Molecular cell biology, Johns Hopkins University); 2014
4. Angela Park (Biomedical engineering, Johns Hopkins University); 2014-2017
5. Jake Kim (Biomedical engineering, Johns Hopkins University); 2015
6. Sarah Sukardi (Biomedical engineering, Johns Hopkins University); 2015
7. Wooyang Son (Biomedical engineering, Johns Hopkins University); 2016-2017  
*Current affiliation: Medical student at Johns Hopkins School of Medicine*
8. Christina Sierra (Chemical bioengineering, Johns Hopkins University); 2016
9. Benjamin Evans (Chemistry, Johns Hopkins University); 2017-present
10. Victoria Yu (Biomedical engineering, Johns Hopkins University); 2017-present
11. Eugene Oh (Biomedical engineering, Johns Hopkins University); 2017-present
12. Vicky Prizmic (Chemistry, Johns Hopkins University); 2017-present
13. Amanda Rucci (Biomedical engineering, Johns Hopkins University); 2019-present
14. Vicky Wang (Biomedical engineering, Johns Hopkins University); 2019-present
15. Amy van Ee (Biomedical engineering, Johns Hopkins University); 2019-present

### Graduate student mentoring

1. Frances Wang (MD candidate, School of Medicine, Johns Hopkins University); 2014
2. Andrew Wang (Medical student, Johns Hopkins University); 2018-2019

## Professional Memberships

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|-----------|---|
| 2009-2013 | Society for the Study of Reproduction (SSR)                 |
| 2015-2019 | Society for Investigative Dermatology (SID)                 |
| 2017-2018 | Korean-American Scientists and Engineers Association (KSEA) |
| 2019-2010 | Korean Society for Investigative Dermatology (KSID)         |

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## Patents

1. **Patent KR1006304890000** Peptides for modulating immune response. (Registered 2006. 09. 25)
2. **Patent International Patent Application No. PCT/KR2006/003520**  
Stabilized vitamin C derivatives having a peptide molecules, preparation method thereof, and composition containing the same. (Registered in in Korea, Europe, Unite States, and Japan)

## Presentations

1. Lack of FSH-responsiveness in granulosa cells from hen prehierarchical follicles is mediated by  $\beta$ -Arrestin. **D Kim**, OM Ocón-Grove and AL Johnson. **Oral Presentation-Society for the Study of Reproduction** in University Park, PA, 2012
2. Acquisition of VIP responsiveness promotes granulosa cell differentiation and regulates clock gene expression. **D Kim**, OM Ocón-Grove and AL Johnson. **Oral Presentation-Society for the Study of Reproduction** in Montréal, Québec, Canada 2013
3. Regulation and Disruption of the site-specific skin gene KRT9. **D Kim**, MZ Hossain, A Nieves, L Gu, NB Yang, SM Oh, S Han, J Qi, JM Taube, S Kang and LA Garza. **Oral Presentation-Concurrent mini-symposia- the Society for Investigative Dermatology** in Atlanta, Georgia, 2015
4. dsRNA induces ectopic KRT9 expression via WNT/ $\beta$ -catenin-mediated signaling. **D Kim**, M. Hossain, S Resnik, R Chen, P Dube, C Sierra, JM Taube, S. Kang, LA Garza. **Oral Presentation-Concurrent mini-symposia- the Society for Investigative Dermatology** in Scottsdale, Arizona, 2016
5. After skin wounding, noncoding dsRNA coordinates prostaglandins and WNT7b to promote regeneration. AS Zhu, A Li, **D Kim**, TS Ratliff, M Melsom, LA Garza. **Oral Presentation-Concurrent mini-symposia- the Society for Investigative Dermatology** in Portland, Oregon, 2017
6. Non-coding double stranded RNA induces retinoic acid synthesis and signaling to control regeneration. **D Kim**, R Chen, S Kim, A Park, W Son, B Evans, V Yu, E Oh, L Miller, S Kang, G Ghiaur, J Yu, W Huang, M Kane, LA Garza. **Poster Presentation-North American Hair Research Summit** in Orlando, Florida, 2018
7. Non-coding double stranded RNA induces retinoic acid synthesis and signaling to control regeneration. **D Kim**, R Chen, S Kim, A Park, W Son, B Evans, V Yu, E Oh, L Miller, S Kang, G Ghiaur, J Yu, W Huang, M Kane, LA Garza. **Oral Presentation-Concurrent mini-symposia-International Investigative Dermatology** in Orlando, Florida, 2018
8. Non-coding double stranded RNA induces retinoic acid synthesis and signaling to control regeneration. **D Kim**, R Chen, S Kim, A Park, W Son, B Evans, V Yu, E Oh, L Miller, S Kang, G Ghiaur, J Yu, W Huang, M Kane, LA Garza. **Invited Short Talk-FASEB, 4<sup>th</sup> International conference on retinoid**, Steamboats Spring, Colorado, 2018
9. Noncoding dsRNA induces retinoic acid synthesis to stimulate regeneration. **D Kim**, R Chen, M Sheu, N Kim, S Kim, N Islam, E Wier, A Li, G Wang, A Park, W Son, B Evans, V Yu, E Oh, Z Wang, L Miller, S Kang, G Ghiaur, J Yu, W Huang, J Jones, M Kane, LA Garza. **Oral Presentation- the Korean Society for Investigative Dermatology** in Seoul, South Korea, 2019
10. Noncoding dsRNA induces retinoic acid synthesis to stimulate regeneration. **D Kim**, R Chen, M Sheu, N Kim, S Kim, N Islam, E Wier, A Li, G Wang, A Park, W Son, B Evans, V Yu, E Oh, Z Wang, L Miller, S Kang, G Ghiaur, J Yu, W Huang, J Jones, M Kane, LA Garza. **Selected for oral Presentation-Concurrent mini-symposia - the Society for Investigative Dermatology** in Chicago, Illinois, 2019 (May 8-11)