BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Myung, Peggy Suejin	Assistant Professor, Dermatology
eRA COMMONS USER NAME (credential, e.g., agency login) PEGGYMYUNG	

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

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
University of Iowa, IA	B.S.	05/95	Biochemistry
University of Pennsylvania, PA	M.D./Ph.D.	05/03	Immunology
University of Pennsylvania, PA	Resident	06/06	Otorhinolaryngology
University of Pennsylvania, PA	Post-doc	06/08	Dermatology
Univ Hospitals Case Western Reserve, OH	Resident	06/12	Dermatology
Yale University, New Haven, CT	Fellow	06/14	Dermatopathology
Yale University, New Haven, CT	Instructor	06/15	Dermatology/Dermpath

A. Personal Statement

My career centers on integrating basic science research in skin development and cancer with clinical dermatology. My graduate studies examined signaling pathways that govern T-cell development and mature T-cell activation and has served as a foundation for my current interest in understanding the signals that orchestrate hair follicle development and how these same mechanisms iteratively regulate tissue homeostasis and disease. I was first introduced to hair follicle stem cell research under the guidance of George Cotsarelis, MD (Univ of Pennsylvania) exploring the morphogenetic signals that regulate wound-induced hair neogenesis. I continued this work into my residency training with Radhika Atit, PhD (CWRU) where I gained exposure to a developmental biologist and studied the requirement for Wnt in adult hair regeneration. During my residency I also published two reviews on hair follicle stem cells and hair growth in collaboration with Mayumi Ito, PhD (NYU), an expert in cutaneous stem cells. I also discovered my niche in dermatopathology, as it inherently bridges human skin disease and research. During my fellowship training at Yale University, I integrated my clinical training with research and worked under the mentorship of Valentina Greco, PhD, an established investigator in hair follicle stem cell research and live imaging. Here, I used live imaging to examine how Wnt signaling in hair follicle stem cells induces collective epithelial growth during hair regeneration (Science 2014). My career goals are to advance research in skin development and cancer and to improve clinical care through innovative research. Currently, I am an investigator in the Department of Dermatology at Yale where I plan to use the tools I have gained during my training to advance my research aims, which examine the tissue interactions that promote skin development and regeneration as well as how these mechanisms are corrupted in disease states. The goal of this grant is to understand how the hair follicle microenvironment, or niche, influences hair follicle epithelial growth and cell fate as well as how it can also alter or mitigate the growth of oncogenic cells in basal cell carcinoma (BCC), the most common cancer. Briefly, we will define the cellular and molecular mechanisms that couple embryonic dermal niche formation to epithelial growth and cell fate. In parallel, we will determine how the dermal niche can be used to control oncogenic epithelial growth in BCC. This study will not only provide novel treatment approaches for BCC, but will also provide a basis for new cancer therapy targets that exploit built-in mechanisms of growth control.

1. Myung PS, Dermanov GS, Jordan MS, Punt JA, Liu QH, Judd BA, Meyers EE, Sigmund CD, Freedman BD & Koretzky GA. (2001). Differential requirement for SLP-76 domains in T cell development and function. Immunity. 15:1011-1026.
2. Myung P, Takeo M, Ito M & Atit R. (2013). Epithelial Wnt ligand secretion is required for adult hair follicle regeneration. J. Invest. Dermatol. 133:31-41. PMCID: PMC3479363
3. Deschene E*, Myung P*, Rompolas P, Zito G, Taketo M, Saotome I, & Greco V. (2014) β-catenin activation regulates tissue growth via a non-cell autonomous mechanism within the hair stem cell niche. Science. 343:1353-1356. PMCID: PMC4096864 (* Co-first authors)

B. Positions and Honors

Positions and Employment

1995-2003	MD/PhD student, PhD thesis with Gary Koretzky, MD, PhD, University of Pennsylvania, PA
2003-2004	Intern, General Surgery, Hospital of the University of Pennsylvania, PA
2004-2006	Resident, Otorhinolaryngology, Hospital of the University of Pennsylvania, PA
2006-2008	Post-doctoral research with Dr. George Cotsarelis, Dermatology, University of Pennsylvania
2008-2012	Resident (research track), Dermatology, UH Case Western Reserve, OH Research with Radhika Atit, PhD, Biology and Dermatology, Case Western Reserve Univ.
2012-2014	Dermatopathology Fellow, Dermatology, Yale University, CT Post-doctoral research with Valentina Greco, PhD, Genetics & Dermatology, Yale University
2014-2015	Instructor of Dermatology, Yale University, New Haven, CT
2015-	Assistant Professor of Dermatology & Pathology, Yale University, New Haven, CT

Honors

1992-1995	Dean's list, University of Iowa (1995 - President's list)
1999-2001	American Heart Assocation Predoctoral Fellowship
1997	Junior inductee of the Alpha Omega Alpha Medical Honor Society
2002	Winner of University of Pennsylvania Saul-Winegrad Award for Best Thesis in Immunology
2010-2011	Dermatology Foundation Dermatologist Investigator Research Fellowship (DIRF)
2011-2012	Dermatology Foundation DIRF (Competitive Renewal)
2011	North American Hair Research Society Mentorship Award (Advisor: Mayumi Ito, NYU)
2011	Winner of the Best Resident Research Award, Univ Hospitals Case Western Reserve
2012	Winner of the American Society of Dermatopathology Physician-In-Training Best Fellow's Oral Presentation
2013	International Investigative Dermatology World Congress Travel Fellowship Award
2013	Winner of the American Society of Dermatopathology Physician-In-Training Best Fellow's Oral Presentation
2014	Albert Kligman Society for Investigation Dermatology Travel Fellowship Award
2014	Dermatology Foundation Physician-Scientist Career Development Award
2016	American Society of Clinical Investigation Young Physician-Scientist Award
2016	Winner of Best Young Physician-Scientist Poster, American Society of Clinical Investigation

Other Experiences and Professional Memberships

2009-	Member, Women's Dermatologic Society
2009	Representative, Society for Investigational Dermatology Resident Retreat for Future Academicians
2009-	Member, Dermatology Foundation
2012-	Board Certification: American Board of Dermatology
2012-	Member, American Society of Dermatopathology
2013	Session Chair, Gordon Research Seminar (Lucca, IT)
2014	Board Certification: American Board of Dermatopathology
2015-	Leaders Society Member, Dermatology Foundation
2015-	Member, Yale Cancer Center
2016	Member, Society for Investigational Dermatology Resident Retreat Committee
2016-2021	Member, Committee on Scientific Programs, Society for Investigational Dermatology
2016	Member, Yale School of Medicine MD/PhD Program Committee

C. Contributions to Science

1. My early studies focused on elucidating the molecular signals regulating T-cell receptor dependent T-cell development and cell fate commitment, as well as mature T-cell activation. Specifically, I developed genetic mouse models to study how SLP-76, an adapter molecule required for TCR signaling, couples receptor activation to downstream effector pathways and subsequent T-cell development and activation.

This work established the importance of distinct structural domains in mediating T-cell development and mature T-cell activation. Fundamentally, these studies served as the groundwork for my career's pursuit to explore the molecular mechanisms that govern distinct cell fate decisions during development and how these same pathways regulate adult tissue homeostasis.

a) Peterson EJ, Woods ML, Dmowski SA, Derimanov GS, Jordan MS, Wu JN, Myung PS, Liu QH, Pribila JT, Freedman BD, Shimuzu Y, & Koretzky GA. (2001) Coupling of the TCR to integrin activation by SLAP-130/Fyb. Science. 293:2263-2265.
b) Koretzky GA & Myung PS. (2001) Positive and negative regulation of T-cell activation by adaptor proteins. Nature Reviews Immunol. 1:95-107.
c) Myung PS, Dermanov GS, Jordan MS, Punt JA, Liu QH, Judd BA, Meyers EE, Sigmund CD, Freedman BD & Koretzky GA. (2001). Differential requirement for SLP-76 domains in T cell development and function. Immunity. 15:1011-1026.
d) Judd BA, Myung PS, Obergfell A, Meyers E, Cheng AM, Watson SP, Pear WS, Allman D, Shattil SJ & Koretzky GA. (2002). Differential requirement for LAT and SLP-76 in GPVI vs T cell receptor signaling. J. Exp. Med. 195:705-717.

2. My subsequent studies coupled my interest in understanding developmental cell fate decisions with understanding how adult somatic stem cells regulate tissue regeneration by engaging signals that mediate development and organogenesis. Utilizing the hair follicle as a versatile model to study how resident hair follicle stem cells regulate hair follicle regeneration, I showed that Wnt ligands provided by hair follicle stem cells are critical for Wnt activation in both hair follicle epithelial and melanocyte stem cells during hair follicle regeneration. Further, this work revealed that epithelial Wnts are essential to promote adult de novo wound-induced hair follicle neogenesis. In sum, this work helped establish the hierarchy of epithelial-mesenchymal and epithelial-melanocyte interactions that govern coordinated hair follicle regeneration.

a) Rabbani P, Takeo M, Chou W, Myung P, Bosenberg M, Chin L & Ito M. (2011) Coordinated activation of Wnt signaling in epithelial and melanocyte stem cells in a shared niche initiates pigmented hair follicle regeneration. Cell. 145:941-955. PMID: 21663796
b) Myung P & Ito M. (2012). Dissecting the bulge in hair regeneration. J. Clin. Invest. 122:448-454. PMCID: PMC3266778
c) Myung P, Takeo M, Ito M & Atit R. (2013). Epithelial Wnt ligand secretion is required for adult hair follicle regeneration. J. Invest. Dermatol. 133:31-41. PMCID: PMC3479363

3. To further elucidate the role of Wnt activation in hair follicle stem cell activation and growth, I utilized live imaging technology to show that constitutive activation of Wnt in hair follicle stem cells leads to the recruitment of surrounding epithelial cells, which together, result in cooperative epithelial growth. This work revealed a novel mechanism that explains how Wnt activation promotes coordinated epithelial growth during hair follicle regeneration, as well as how Wnt signaling functions as a tumor promoter during carcinogenesis. My current research interest branches from this work to examine how Wnt activation in the mesenchyme regulates hair follicle development as well as basal cell carcinoma, a tumor that recapitulates embryonic hair germ epithelium. Although essential for hair follicle development, very little is known about how the dermal niche is initially formed and how it regulates epithelial hair follicle growth. This has precluded studies to examine how the dermal niche regulates the growth of oncogenic cells during carcinogenesis. We are currently coupling live imaging with mouse genetic tools to capture these events in mouse embryonic skin and in mouse BCC models.

a) Deschene E*, Myung P*, Rompolas P, Zito G, Taketo M, Saotome I, & Greco V. (2014) β-catenin activation regulates tissue growth via a non-cell autonomous mechanism within the hair stem cell niche. Science. 343:1353-1356. PMCID: PMC4096864 (* Co-first authors)
b) Mesa K, Rompolas P, Zito G, Myung P, Sun T, Brown S, Gonzalez D, Blagoev K, Haberman A & Greco V. (2015). Niche induced cell death and epithelial phagocytosis regulate hair follicle stem cell pool. Nature. 522:94-97. PMCID: PMC4457634
c) Hamburg E, Myung P, & Cowper, S. (2016). Clinical and basic immunodermatology: Cutaneous fibrosis and normal wound healing. 2nd Edition. London, UK: Springer-Verlag.
d) Xin T, Greco V, & Myung P. (2016). Hardwiring stem cell communication through tissue structure. Cell. 164:1212-1225. PMCID: PMC4805424

Complete List of Published Work in MyBibliography

http://www.ncbi.nlm.nih.gov/sites/myncbi/peggy.myung.1/bibliography/47940199/public/?sort=date&direction=ascending.

D. Research Support

Ongoing Research Support

K08AR066790-03, Peggy Myung (PI) 07/01/2014 – 06/30/2019 9. Calendar
NIH: Career Development Award
The Role of Non-Cell Autonomous Wnt Activation in Hair Follicle Growth and Cancer
The aim of this grant is to study the dynamics of non-cell autonomous Wnt/β-catenin signaling during hair follicle stem cell activation and hair regeneration and how these mechanisms are utilized to promote skin carcinogenesis.

Completed Research Support

Global Fibrosis Foundation, Myung (PI) 07/01/2015-06-30-2016 Peggy Myung (PI)
GFF: Research Grant
The aim of this grant is to study the role of dermal Wnt activation in mouse embryonic hair follicle development and in adult regenerative wound healing.

Dermatology Foundation Dermatologist Investigator Research Fellowship Peggy Myung (PI)
07/01/2011 - 06/30/2012
The goal of this study is to examine the function of epidermal Wnt ligand secretion in promoting hair growth and adult wound-induced hair follicle neogenesis.
Role: PI

Dermatology Foundation Dermatologist Investigator Research Fellowship Peggy Myung (PI)
07/01/2010 - 06/30/2011
The goal of this study is to examine the function of Wnt signaling in the dermis during adult wound-induced hair follicle neogenesis in vivo
Role: PI