Dermatology Foundation

2018

Research Award Recipients

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Contents

Charles & Daneen Stiefel Scholar Award in Skin Cancer

Todd W. Ridky, M.D., Ph.D.
University of Pennsylvania
Inhibiting Melanoma Via a Novel and Druggable GPCR Pathway

Women, especially previously-pregnant women, have more favorable melanoma outcomes than men do. The underlying reason has been unknown, but preliminary studies in our lab indicate that much of this protection results from a newly appreciated type of estrogen receptor, called GPER, that is found on melanocytes, the cells involved in melanoma. Activating these receptors in mice reprograms the tumor melanocytes toward a more “differentiated” state that makes them more vulnerable to current immunotherapies. Now we will test the ability of new estrogen derivatives that activate only GPER, and not the classic estrogen receptor, to make immunotherapies more effective and inhibit melanoma.

Public Health/Clinical Career Development Award in Health Care Policy

Katrina E. Abuabara, M.D. – Year 3
University of California, San Francisco
Eczema Epidemiology and Comorbidities

This study aims to determine the prevalence, severity, and duration of eczema in both children and adults in a large population-based cohort. We will also quantify the occurrence of the most common new diagnoses that develop in eczema patients and calculate any increased risk of comorbid disease. Finally, we will determine whether patients with severe eczema have an increased risk of autism.

Arianne S. Kourosh, M.D., M.P.H. – Year 2
Massachusetts General Hospital
Avatoras: A Telehealth Innovation to Address Access and Compliance Barriers for Chronic Skin Disease

Avatoras is a teledermatology application for follow-up visits for skin disease through video-conferencing. This project will explore if it can provide equal quality of care and satisfaction for patients compared with in- person doctor visits, and thus determine if this healthcare model can serve as a practical and cost-effective option for dermatology visits for patients who face barriers in obtaining dermatologic care.

Megan Noe, M.D., M.P.H. – Year 2
University of Pennsylvania
Risk of Hospitalization for Pneumonia Adults with Chronic Skin Diseases

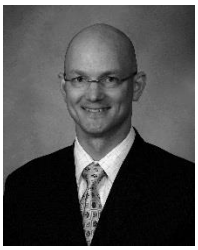
Infections, including pneumonia, are common causes of hospitalization in adults with chronic skin diseases. The purpose of this study is to determine the risk of pneumonia hospitalization and identify predictors of influenza and pneumonia vaccination, as they represent modifiable risk factors. These results will improve patient care by identifying patients most at risk for hospitalization from pneumonia and identifying opportunities to improve vaccination practices.

Public Health/Clinical Career Development Award in Health Care Policy, Cont.

Aaron M. Secrest, M.D., Ph.D., M.P.H.
University of Utah
Clinical Utility of Patient-Reported Outcomes in Dermatology

Electronic patient-reported outcomes (PROs) are collected from all patients in our large academic dermatology department to identify symptoms and inform clinical care. We will use these PROs to determine the real-world burden of skin diseases and the effectiveness of dermatology treatments at improving quality of life. These data will enhance dermatologists' provision of targeted and patient-centered care and counseling regarding skin disease and its treatment.

Clinical Career Development Award in Dermatologic Surgery



Christian L. Baum, M.D. – Year 3
Mayo Clinic, Rochester
Prognostic Risk Factors and Interventions for Patients with cSCC and CLL/NHL

Patients with chronic lymphocytic leukemia/non-Hodgkin lymphoma (CLL/NHL) have an increased risk of developing cutaneous squamous cell carcinoma (cSCC), and worse outcomes if they develop it. We aim to identify molecular and genetic tests that will help to predict a patient's risk of cSCC, and the outcome when it coexists. We will also refine surgical techniques for treating cSCC to improve patient outcomes in this group.

Jeremy R. Etzkorn, M.D. – Year 2
University of Pennsylvania
Coherent Anti-Stokes Raman Spectroscopy for Basal Cell Carcinoma Diagnosis and Surgical Management

Many patients present for diagnosis and treatment of basal cell carcinoma. The goal is to develop a noninvasive diagnostic tool (avoiding biopsy) producing a rapid, objective evaluation of the skin. The project will use an amplified version of Raman spectroscopy that requires minimal operator training, and evaluate the utility of this tool for basal cell carcinoma diagnosis and for streamlining Mohs surgery.

Emily Stamell Ruiz, M.D. – Year 3
Brigham and Women's Hospital
Skin Cancer Equity and Expenditure Analysis

Identifying areas of disparity with respect to skin cancer incidence, treatment, cost, and outcomes is crucial to optimizing allocation of resources and providing high-quality, cost effective care. This study will estimate the occurrence and cost of skin cancer screening and treatment, identify care disparities in skin cancer screening and treatment, and then identify skin cancer treatment trends utilizing the All-Payer Claims Databases.

Clinical Career Development Award in Dermatologic Surgery, Cont.

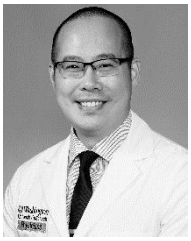
Mary L. Stevenson, M.D.
New York University
Identification of Novel Risk Factors and Biomarkers for Poor Outcomes in Squamous Cell Carcinoma

While the majority of patients with cutaneous squamous cell carcinoma have excellent prognosis, a small subset of patients will develop metastasis. Identification of which tumors will behave aggressively is essential to improved prognostication guidelines and treatment algorithms. We aim to identify novel risk factors and biomarkers associated with tumors at risk for poor outcomes.

Abigail Waldman, M.D., M.H.S.
Brigham and Women's Hospital
Skin Cancer Life Impact and Functional Evaluation (LIFE)

Patient-reported outcome measures (PROMs)—validated questionnaires developed from patient interviews—offer potential to improve patient health outcomes. No skin cancer-specific PROMs exist despite the knowledge gap in our understanding of how skin cancer affects patient quality of life. The aim of this study is to develop such an instrument using qualitative data from patient interviews that could be rapidly implemented in clinical care.

Physician Scientist Career Development Award



David Y. Chen, M.D., Ph.D.
Washington University
Epigenetic Regulation of Skin Homeostasis and Tumorigenesis

Increasing age and sun exposure, both major risk factors for developing skin cancer, are also associated with specific changes in DNA methylation in the skin. The goal of this study is to understand whether such changes in DNA methylation affect the ability of normal skin cells to become cancerous.

William E. Damsky, M.D., Ph.D.
Yale University
Elucidating and Overcoming Mechanisms of Immunotherapy Resistance in Melanoma

Responses to immune checkpoint inhibitor therapy in melanoma are heterogeneous, and many patients will succumb to disease due to intrinsic or acquired resistance to therapy. Defects in tumor cell intrinsic IFNγ-JAK-STAT signaling have been noted in some resistant human melanomas. We will use novel mouse models of melanoma to study the functional role these defects play in resistance to immunotherapy, and devise strategies to overcome them.

Physician Scientist Career Development Award, Cont.

Marlys S. Fassett, M.D., Ph.D. – Year 2
University of California, San Francisco
IL-31: Coupling Itch and Rash in Atopic Dermatitis

Itch ranks foremost among frustrating symptoms of atopic dermatitis. We hypothesize that IL-31, an itch- and atopic dermatitis-associated cytokine, dynamically modulates both skin inflammation and itch sensation. We will use genetic mouse models to map IL-31's pathways and presence, reveal its activities in allergic skin inflammation, and define molecular links between activated T cells in the immune response and neurosensory pathways in skin dependent upon IL-31.

Jennifer G. Gill, M.D, Ph.D. – Year 2
Southwestern Med. School Univ. of Texas
Transcriptional and Metabolic Adaptations of Melanoma Metastases

Metastatic melanoma is a devastating disease with a poor prognosis. Compared to other metastatic cancers, melanoma has a remarkable propensity to spread to many different organ sites. The goal of my research is to gain better understanding of the mechanisms by which melanoma metastasizes and adapts to such heterogeneous environments, with the ultimate goal of designing new targeted therapies for use in patients.

Tamia A. Harris-Tryon, M.D., Ph.D. – Year 3
Southwestern Med. School Univ. of Texas
Determining the Function of Resistin-Like Molecule alpha (RELMa) in Cutaneous Host Defense

Though insight has been gained into which organisms reside on the surface of the skin-- collectively termed the skin microbiota—little is known about how they impact the immune system. I aim to characterize the function of the resistin-like molecule, alpha (RELMa), a molecule that is produced in much greater quantity in the presence of the microbiota. I hypothesize that RELMa is an antimicrobial peptide at the skin surface.

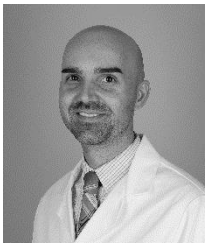
Allen W. Ho, M.D., Ph.D.
Brigham and Women's Hospital
Mechanisms of Immune Tolerance to Apoptotic Cells and Its Role in Cutaneous Autoimmunity

Cutaneous lupus erythematosus (CLE) significantly impacts patients' quality of life, socioeconomic status, and physical appearance. However, our current understanding of CLE pathogenesis is limited, making the development of targeted therapies difficult. This proposal aims to investigate how immune cells can trigger CLE by aberrantly responding to dying cells, and then to leverage this information to develop targeted therapies to treat CLE.

Physician Scientist Career Development Award, Cont.

John C. Selby, M.D. – Year 3
University of Iowa
The Mechanobiological Paradigm of Keratinocyte Re-Epithelialization: Effects of Matrix Stiffness

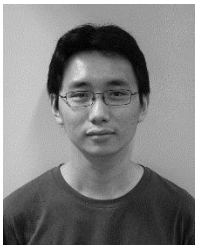
This project will use an *in vitro* model of wound re-epithelialization to demonstrate that the degree of mechanical stiffness of dermal extracellular matrix affects keratinocyte migration, activation, and differentiation. By extension, this project will also seeks to validate the relevance of the Rho/ROCK signaling pathway in keratinocyte mechanosensation and the stiffness-induced deregulation of epidermal activation and differentiation that is manifest in chronic skin wounds.



Cory L. Simpson, M.D., Ph.D. – Year 2
University of Pennsylvania
Mechanism of Selective Autophagy in Epidermal Differentiation and Homeostasis

Autophagy is an intracellular degradation system that enables cells to "recycle" damaged organelles. This scavenging pathway is altered in dermatologic disorders like psoriasis, barrier dysfunction (the ichthyoses), and skin cancers, so studying autophagy may reveal new treatment strategies for these diseases. I utilize state-of-the-art microscopes to visualize autophagy proteins within a three-dimensional model to reveal how skin cells degrade organelles during their development or after environmental injury.

Science of Human Appearance Career Development Award



Ka Wai Mok, Ph.D. – Year 3
Icahn School of Medicine at Mount Sinai
Identifying the Key Niche Signals for Hair Follicle Formation

Hair regenerative therapy by new hair formation may be the definitive hair loss treatment. Hair formation is orchestrated by dermal papilla (DP) cells. The current lack of understanding what the initial DP inductive signals are prevents their direct therapeutic application. In this study, I will uncover the earliest essential hair inductive signals from DP for hair formation to advance the development of hair regenerative therapies.

Medical Dermatology Career Development Award

Joshua Arbesman, M.D. – Year 3
Case Western Reserve University
Identifying Novel Preventative Approaches in Melanoma Using Genetics of Very High-Risk Families

Melanoma rates have been increasing over the last decades. This project will study an unusual family who has developed many melanomas to isolate the mutated gene causing them. Then we will examine tissue specimens from noninherited melanoma tumors to determine how often this family-associated mutation occurs in these tumors as well. We will use drug screening libraries to identify a novel drug for preventing new melanoma development associated with this mutation.

Zelma C. Chiesa-Fuxench, M.D. – Year 2
University of Pennsylvania
Atopic Dermatitis: Expanding Our Understanding of Complex Disease in the Hispanic Population

Atopic dermatitis (eczema), the most common inflammatory disease, affects children and adults. It is poorly understood, and symptoms significantly erode quality of life. Eczema involves environmental and genetic factors. The primary gene identified so far is most relevant to European ancestry. Hispanics are the largest minority group in the U.S. This project will study eczema in this population to improve understanding and treatment of this disease.

Benjamin H. Kaffenberger, M.D.
Ohio State University
Prospective Categorization and Outcome Analysis of Cutaneous Drug Eruptions

Cutaneous adverse drug eruptions (drug rashes) are the most common skin disease in the hospital, but our current understanding of these reactions is extremely limited. This grant will support the development of new tools to differentiate the most common drug eruptions, while using national datasets to identify evidence for the importance of early and accurate recognition and intervention in these reactions.

Cecilia Larocca, M.D.
Brigham and Women's Hospital
An Implantable Microdevice for Candidate in Situ Drug Sensitivity Testing in Mycosis Fungoides

Our project will employ an innovative implantable microdevice within the native tumors of cutaneous lymphoma patients for in situ drug sensitivity testing. We will determine if local responses to drug microdoses correlate with clinical response to systemically administered treatments, and thus can serve as a rapid screen for investigational agents. Correlations with genomic markers will be performed to generate valuable therapeutic hypotheses for future trials.

Medical Dermatology Career Development Award, Cont.

Hadar Lev-Tov, M.D., M.A.S. – Year 2
University of Miami
Understanding First Venous Leg Ulcers in People with Venous Insufficiency

Venous ulcers are common, debilitating, costly, and difficult to treat, yet the mechanism for ulcer persistence is unknown. Leg vein dysfunction leads to ulceration, but not all people with such dysfunction ulcerate. We will examine large populations to identify the differences between people who ulcerate from those who don't, ultimately helping doctors treat venous ulcers more effectively and educate patients more effectively.

Alina Markova, M.D. – Year 2
Cornell University
Epidemiology and Mechanisms of Dermatologic Disease in Hospitalized Patients with Cancer

Among hospitalized patients in a cancer center, we will: 1) quantify the incidence and delineate diagnoses prompting inpatient dermatologic consultation, and determine their attribution to cancer therapies; 2) identify those at risk for severe cutaneous adverse reactions (SCARs) and toxicities; 3) describe associated clinical, serological, and histopathological features of SCARs and high-grade skin toxicities. Results will form the basis for dermatologic involvement in hospitalized cancer care.

Haley B. Naik, M.D. – Year 3
University of California, San Francisco
Investigating the Role of the Skin Microbiome in Hidradenitis Suppurativa

Hidradenitis suppurativa (HS) is a chronic relapsing inflammatory disease with significant morbidity and no uniformly effective therapy. My project will systematically investigate the relationships between HS disease flares and alterations in the skin microbiome and immune response. Understanding these relationships may guide therapies aimed directly at modifying the skin microbiome and thus regulating the immune response, and thereby significantly improve management of this disease.

Xiaolong Zhou, M.D., M.Sc.
Northwestern University
Characterization of the Skin Microbiome in Cutaneous T Cell Lymphoma

Cutaneous T cell lymphoma (CTCL) is the most common type of skin lymphoma. Patients with advanced disease often suffer from, and die of, skin infections. In addition, certain bacteria can drive CTCL progression. This study will characterize the bacterial composition—the skin microbiome—of affected skin at different stages of CTCL, and also determine if decreased bacterial diversity is associated with more advanced and refractory disease.

Women's Health Career Development Award

Chung-Ping Liao, Ph.D. – Year 3
Southwestern Med. School Univ. of Texas
Mechanisms Regulating Hair Pigmentation and Development

Hair is a tissue uniquely present in mammals, including humans. We recently discovered a new population of hair-generating progenitor cells and further found that they control hair pigmentation via a growth factor. My future research will investigate the mechanisms of hair pigmentation as well as gene regulation during hair development, and determine their relevance to the graying and loss of human hair.

Ian D. Odell, M.D., Ph.D. – Year 2
Yale University
Functional Analysis of Dendritic Cells and Development of a Humanized Mouse Model of Scleroderma

Scleroderma is an autoimmune disease that leads to fibrosis of skin, lungs, and other organs, and has one of the highest mortality rates among autoimmune diseases. By studying how this disease occurs in human patients and modeling the disease in mice, we plan to investigate how different parts of the immune system lead to excessive fibrosis and thereby help develop new targeted therapies.

Jillian M. Richmond, Ph.D.
University of Massachusetts
Targeting the CXCR3 Chemokine Axis in Cutaneous Lupus

Lupus is an autoimmune disease, a type of disease in which the body's immune cells mistakenly attack the body's own tissues. We will determine which molecular signals control the ability of these immune cells to get into the skin in lupus patients, with the hope of identifying new markers of disease and targets for treatment.

Research Career Development Award

Nathan K. Archer, Ph.D.
Johns Hopkins University
The Role of IL-1alpha in Atopic Dermatitis Skin Inflammation

Atopic dermatitis (AD) involves complex interactions between host and environmental factors that are not fully understood. To better understand the underlying immune mechanisms of this skin disease, we will utilize a filaggrin-deficient mouse model to investigate the role of keratinocyte-derived lL-1a and its interaction with the skin microbiome in promoting disease-related inflammation. Our goal is to treat AD—and potentially other inflammatory skin disorders—more effectively.

Research Career Development Award, Cont.

Ryan P. Hobbs, Ph.D.
Penn State University
Cellular and Molecular Roles for Autoimmune Regulator in Early Skin Tumorigenesis

Global rates of skin cancers and autoimmune diseases are rising and creating tremendous public health and economic burdens. Aire (*a*uto*i*mmune *re*gulator), already known to influence autoimmunity, is also a key protein that promotes inflammation and nonmelanoma skin tumor growth. By determining molecular functions for Aire in skin, we will identify targets for new therapeutics that may serve as alternatives to laborious, expensive, and cosmetically disruptive surgery.

Wenqing Li, Ph.D. – Year 3
Brown University
Clinical and Genetic Epidemiology of Atypical Nevi

Using data from 51,529 participants in the Health Professionals Follow-up Study, we will evaluate how sun exposure, pigmentary traits (hair color, eye color, sunburn susceptibility), genetic predisposition—individually and in interaction—modify the inherent melanoma risk of atypical nevi (AN), a potential melanoma precursor. We will also carry out a comprehensive investigation to characterize how the interplay of AN with known genetic and nongenetic factors alters the rate of new melanoma cases.

Yun Liang, Ph.D.
University of Michigan
The Role of VGLL3 in Regulation of Sexually Dimorphic, IFN-mediated Immune Processes

By delineating the role of the gene transcription factor VGLL3 in shaping the sex-specific responses to interferon, this study is designed to understand the molecular basis of a fundamental difference between men and women in immune regulation in skin. Clinically, it may provide a helpful target and pathway for preventing and treating autoimmune skin diseases, and also shed light on the sex-specific treatment of these diseases.

Gatien Moriceau, Ph.D. – Year 2
University of California, Los Angeles
Exploiting Mechanisms of Drug Addiction to Suppress MAPKi Resistance in Melanoma

Therapies targeting a common melanoma mutation have delivered significant survival benefits. However, resistances to these therapies almost always develop with time. We discovered that these therapy-resistant melanomas paradoxically have developed an addiction to these drugs, such that drug withdrawal induces melanoma cell death. By understanding the underlying mechanisms, we will devise strategies to augment this addiction as a general way to deliver further patient survival benefits.

Research Career Development Award, Cont.

Bethany E. Perez-White, Ph.D. – Year 2
Northwestern University
Breaking Down Barriers: Defining the Role of EphA2 in Building Epidermal Tight Junctions

Tight junctions between skin cells, vital to healthy skin function, are disrupted in atopic dermatitis. Because we inadequately understand the mechanisms contributing to normal function, therapies to enhance it are elusive. EphA2 is a protein involved in tight junction signaling. We will determine if saturating EphA2 with ephrin-Al, which activates it, can enhance tight junction performance and alleviate the barrier dysfunction of atopic dermatitis.

Bahram Razani, M.D., Ph.D.
University of California, San Francisco
A20 Restricts Psoriatic Inflammation

People who produce less of the enzyme A20 are more susceptible to psoriasis. Thus, A20 seems to protect people against this disease. We are doing experiments to understand which components of the A20 enzyme are most important for its protective function, and how it occurs. This will help us understand why certain people develop psoriasis and identify potential new ways to treat it.

Roberto R. Ricardo-Gonzalez, M.D., Ph.D. – Year 3
University of California, San Francisco
Study of Innate Lymphoid Cells Type 2 in the Skin

Scientists are increasingly recognizing atopic dermatitis as a complex dysregulation of both novel groups of immune cells that increase their presence in allergically inflamed skin. We will use genetic mouse models of atopic dermatitis to characterize ILC2s (type 2 innate lymphoid cells) and determine their role in skin health and disease. Ultimately, this study will advance the understanding of iLC2s in the skin and provide new therapeutic targets with the potential for treating allergic skin disease.

Dermatopathology Research Career Development Award

Matthew S. Goldberg, M.D.
Icahn School of Medicine at Mount Sinai
Melanoma Epigenetics and the Functional Role of MacroH2A in Melanoma Progression

Disruption of the epigenome (which includes the histone variant macroH2A) plays a critical role in a wide range of cancers, including melanoma. MacroH2A, which inhibits the metastatic potential of melanoma cell lines in the lab, is lost in invasive and metastatic human melanomas. Associating chromatin biology (the organizing framework) and dermatopathology, I will investigate the mechanisms through which macroH2A deficiency contributes to melanoma progression and metastasis.

Dermatopathology Research Career Development Award, Cont.

Maija Kiuru, M.D., Ph.D. – Year 2
University of California, Davis
Molecular Basis of Inherited and Sporadic Melanocytic Nevi

Moles can be risk markers, mimickers, or precursors of melanoma, the deadliest skin cancer. Melanoma results from mutations in pigment-producing cells. Although understanding these mutations has lead to improved targeted therapies, diagnosing moles and melanoma is not always clear-cut, even via biopsy. I will define mutations in moles to understand how they develop, establish markers to improve diagnosis, and identify molecular targets for prevention and treatment.

Pediatric Dermatology Career Development Award

Leslie A. Castelo-Soccio, M.D., Ph.D. – Year 2
University of Pennsylvania
Genetics and Imaging of Pediatric Hair Disorders

Pediatric dermatology needs advanced tools for quantifying alopecia hair loss and for identifying genes underlying rare hair disorders. I propose using computer-vision imaging tools to enable clinical precision and standardization of care for pediatric alopecia patients. I will identify genes for loose anagen syndrome, uncombable hair syndrome, and hereditary mucoepithelial dysplasia to enable more effective therapies. This research platform can be adapted to identify genes in other pediatric skin and hair disorders.

Elena B. Hawryluk, M.D., Ph.D.
Massachusetts General Hospital
Atypical Pediatric Pigmented Lesions

The features, pathology, and clinical course of Spitz and dysplastic nevi in pediatric patients are poorly understood, particularly how they can lead to the development of melanoma. To identify relevant patterns and improve patient outcomes, I plan to study children and adolescents with these lesions over time, in addition to analyzing their risk factors, overall pattern of nevi, and sun exposure behaviors.

Dermatologist Investigator Research Fellowship

Christopher S. Crowley, M.D.
University of California, San Diego
Investigation of the Role of the Volume Regulated Anion Channels (VRACs) in Keratinocyte Biology

The pathophysiology of Hailey-Hailey disease is poorly understood. A novel possible mechanism relates the elevated cytosolic [Ca2+] found in Hailey-Hailey disease to the activity of the recently characterized volume-regulated anion channels (VRACs) that are in the outer cell membrane and regulate cell volume. We propose to interrogate the role of VRACs in Hailey-Hailey disease and perform relevant structural studies using cryoelectron microscopy.

Marianna Freudzon, M.D.
Yale University
Understanding the Role of GILT in Malaria Transmission in Skin

Understanding malaria transmission at the port of entry in the skin is key to identifying effective targets for vaccine development. We will use innovative imaging technology to examine parasite motility and blood vessel invasion in the dermis at the site of the mosquito bite, focusing on the role of a key mosquito saliva protein, GILT, that binds to the parasite.

Melissa A. Kinnebrew, M.D., Ph.D.
University of California, San Francisco
Defining the Mechanisms of Thermoregulation in the Skin

Subcutaneous fat not only provides the skin with structural support and nutrient storage, it is also crucial for hair follicle cycling, wound healing, systemic metabolism, and thermoregulation. We will investigate the mechanisms by which subcutaneous fat responds to cold temperatures to maintain skin barrier function. These studies may reveal therapeutic targets that can be exploited to treat chronic ulcers, lipoatrophy, and fibrosing skin disease.

Rie Takahashi, M.D., Ph.D.
University of California, Los Angeles
Metabolic Landscape of Human Cutaneous Squamous Cell Carcinomas

We aim to improve understanding of key metabolic pathways that drive cutaneous squamous cell carcinomas (SCCs) in patients. In some tumors, stem cells can proliferate to promote tumor growth and, similar to proliferative cancer cells, utilize glycolysis to do so. We propose that the metabolism of SCCs is linked to their cell of origin, and that disruption of glycolysis may inhibit SCC progression.

Dermatologist Investigator Research Fellowship, Cont.

Margaret Wat, M.D., Ph.D.
Case Western Reserve University
Genetic and Molecular Mechanisms of Cutaneous T Cell Lymphoma

Cutaneous T-cell lymphomas (CTCL) are the most common type of lymphomas that occur in the skin, but how they form and progress is not well understood. We will examine genetic changes in patients with early-onset CTCL to obtain insight into early triggers of this lymphoma. These results can likely improve understanding of CTCL once it has developed.

Sarah Whitley, M.D., Ph.D.
University of Pittsburgh
IL-23 Regulates Cutaneous Resident Memory T Cell Development

In addition to a physical barrier, the skin is a front line where immune cells identify and combat foreign pathogens. CD4 T cells (TCs), a key immune cell, become long-lived memory TCs and endow protection from repeat pathogen challenges. This project will characterize the developmental and maintenance requirements of a newly characterized subset of IL-17-producing skin-resident memory TCs (TRM17) to provide a scientific foundation for their potential therapeutic manipulation.

Research Grant

Duncan Hieu M. Dam, Ph.D.
Northwestern University
Role of Scavenger Receptors in Modulation of Toll-like Receptors Activation in Viral Skin Infections

Viral infections cause a range of high-impact human cutaneous diseases. Invading pathogens are recognized by the innate immune system's toll-like receptors (TLRs), the skin's first line of defense. Scavenger receptors (SRs) help regulate TLR activation in animals, but virtually nothing is known about SRs in human skin. We will study them comprehensively in multiple human skin models. Results could lead to new therapeutic strategies against viruses.

William W. Huang, M.D., M.P.H.
Wake Forest University
Developing the Pyoderma Gangrenosum Area and Severity Index (PGASI): An Outcome Instrument for PG

Pyoderma gangrenosum (PG) is a rare, severe, ulcerating, and painful skin disease. A lack of validated tools to determine the impact of therapy on disease activity has resulted in the absence of a uniform therapeutic standard. This project will develop a standardized measurement instrument for PG—the PG Area and Severity Index (PGASI)—that can be used in future clinical trials.

Diversity Research Supplement Award

Emma Guttman, MD, PhD
Icahn School of Medicine at Mt. Sinai
Difference in the Evaluation, Treatment and Comorbidities of Psoriasis in Patients with Skin of Color

There are significant differences in psoriasis patients between those with skin of color and Caucasians. More pigmented skin may make PASI scoring less accurate, and they may receive more combination therapy. The medical student will help to study severity evaluation in patients with skin types 5 and 6, validate a PASI scoring system, and mine two large databases to characterize treatment and comorbidity differences.

Jennifer T. Huang, MD
Boston Children's Hospital
Examining Racial Disparities in Dermatologic Care of Children with Cancer

Minority adults in the U.S. typically have markedly inadequate access to dermatologic care vis-a-vis Caucasians. Such data are lacking within the pediatric oncology population despite their high burden of dermatologic disease following cancer treatment. Using our demonstration that pediatric dermatologists can improve diagnostic accuracy and treatment for children with oncologic conditions, the medical student will identify the variables relevant to racial disparities and propose care improvement strategies.

Masaoki Kawasumi, MD, PhD
University of Washington
CRISPR-Cas9 Epigenome Editing to Inhibit Skin Cancer

The p16INK4A tumor suppressor gene is frequently inactivated in skin cancers, typically through methylation of its promoter rather than by deletion or mutation. Such epigenetic changes have the potential to be reversed—ie, DNA demethylation, restoring gene expression. The medical student will participate in developing novel epigenome editing tools to induce DNA demethylation, to upregulate this tumor suppressor gene and inhibit skin cancer.

Thomas H. Leung, MD, PhD
University of Pennsylvania
Understanding the Pathogenesis of Neutrophilic Dermatoses

While acute febrile neutrophilic dermatosis (Sweet's syndrome) is clinically well-characterized, little is known about the underlying molecular and cellular programs. Using prospectively collected human tissue, the medical student will help to assess the clonality of infiltrating neutrophils to determine a neoplastic or reactive process, and perform transcriptome analysis of isolated neutrophils to identify altered gene pathways.

Diversity Research Supplement Award, Cont.

Eleni Linos, M.D., M.P.H., Dr.PH
University of California, San Francisco

1. Skin Cancer Prevention in Sexual Minorities

Sexual minority men are a newly identified high-risk group for indoor tanning and potential skin cancer. Directing tanning bed-avoidance health messages to gay men by leveraging social networking sites provides unprecedented and targeted reach, and at relatively low cost. The medical student will help identify the most effective melanoma prevention messages for this group using focus groups, cognitive interviews, and online response data.

2. Dermatologists' Prescriptions of Antihistamines in Older Adults: Data from the National Ambulatory Health Survey 2006-2015

Comorbid conditions, polypharmacy, and altered pharmacokinetics may place older adults at increased risk for adverse drug events. The Beers Criteria outline medications inappropriate for use in older patients. We will use individual-visit data from the National Ambulatory Medical Care Survey (2006–2015), stratified by age group, to determine how often dermatologists prescribe these medications to older adults. The medical student will help perform descriptive weighted analyses.

Junko Takeshita, MD, PhD, MSCE
University of Pennsylvania
Patient-Provider Racial Concordance and Patient Satisfaction

Racial/ethnic disparities in health and health care in the U.S. carry large public health and economic burdens, yet few studies, especially in dermatology, have evaluated the effect of physician race/ethnicity on patient care and outcomes. The medical student will help compare patient satisfaction with physician care (via Press Ganey Score) for visits between racially/ethnically concordant and discordant patient-physician pairs among outpatient visits at UPenn (total, and by medical specialty).

Janis M. Taube, M.D., M.Sc.
Johns Hopkins University
Characterizing Cell Type-Specific PD-1 and PD-L1 Expression in Melanoma

Therapeutic blockade of the PD-1/PD-L1 immune checkpoint pathway generates durable melanoma remissions in a patient subset. PD-L1 expression on melanoma cells as detected by immunohistochemistry is only suggestive of outcome. To identify predictive patterns, we are using multiplex immunofluorescence to determine human cell types expressing PD-L1/PD-1, expression levels, and cellular interactions. The medical student will contribute image analysis and statistically process data.