

CURRICULUM VITAE

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EDUCATION

9/1975-6/1979 Franklin and Marshall College, Lancaster, PA; B.A.
9/1980-6/1984 Pennsylvania State University College of Medicine, Hershey, PA; M.D.

PROFESSIONAL TRAINING AND EXPERIENCE

7/1984-6/1985 Medical Intern, Roger Williams General Hospital, Providence, RI
7/1985-6/1988 Dermatology Resident, Hospital of the University of Pennsylvania, Philadelphia, PA
7/1987-6/1988 Chief Resident, Dermatology, Hospital of the University of Pennsylvania, Philadelphia, PA
7/1988-6/1989 Guest Researcher, Laboratory of Cellular Carcinogenesis and Tumor Promotion (Stuart H. Yuspa, lab chief), Division of Cancer Etiology, National Cancer Institute, National Institutes of Health, Bethesda, MD
7/1989-6/1995 Biotechnology Fellow, Laboratory of Cellular Carcinogenesis and Tumor Promotion (Stuart H. Yuspa, lab chief), Division of Cancer Etiology, National Cancer Institute, National Institutes of Health, Bethesda, MD
7/1995-6/1997 Senior Staff Fellow, Basic Research Laboratory (formerly Laboratory of Tumor Virus Biology; Carl Baker, lab chief), Division of Basic Sciences, National Cancer Institute, National Institutes of Health, Bethesda, MD

ACADEMIC APPOINTMENTS

7/1997-8/2004 Associate Professor, Department of Dermatology, University of Michigan, Ann Arbor, MI
9/2004- Professor, Department of Dermatology, University of Michigan, Ann Arbor, MI

ACADEMIC ADMINISTRATIVE APPOINTMENTS

7/1997- Scientific Director, Cutaneous Oncology Program, University of Michigan Comprehensive Cancer Center, Ann Arbor, MI

CLINICAL/HOSPITAL APPOINTMENTS

7/1997- Staff Physician, University of Michigan Health System

CONSULTING POSITIONS

2008 Merck and Company, Inc., Consultant
2007 Magen Biosciences, Inc., Consultant
2007 Interwest Partners, Consultant
2006-07 Pfizer Inc., Consultant
2004-06 Genentech, Consultant
2006- University of Michigan Comprehensive Cancer Center, Endocrine Oncology Program, Advisory Board
2002- Case Western Reserve University, Skin Diseases Research Center, External Advisory Board

SCIENTIFIC ACTIVITIES

2008- Associate Editor, Journal of Investigative Dermatology
2006- NIH, Oncology Fellowship and Area Study Section
2006- North American Hair Research Society, Board of Directors
2005- Dermatology Foundation, Medical and Scientific Committee
2005- American Skin Association, Medical Advisory Committee
2004 NIH, Tumor Microenvironment Study Section, Ad Hoc Member
2003 NIH, Cancer Genetics Study Section, Ad Hoc Member
2003 Cancer Research UK, Grant Reviewer
2003 NIH, Oral Biology and Medicine 1 Study Section, Ad Hoc Member
2002,03 NIH, National Cancer Institute Program Project Review Panel
2002 National Cancer Institute of Canada, Program Project Review Panel
2001 NIH, National Institute of Arthritis, Musculoskeletal, and Skin Diseases Special Emphasis Review Panel
2000,01 NIH, General Medicine A1 Study Section, Ad Hoc Member

Ad Hoc Journal Reviewer:

American Journal of Pathology, 2002-
Cancer Research, 1994-
Current Biology, 2002-
Development, 2008-
Developmental Biology, 2002-
Journal of Biological Chemistry, 2000-
Journal of Clinical Investigation, 1997-
Journal of Investigative Dermatology, 1992-
Journal of the American Academy of Dermatology, 1999-
Mechanisms of Development, 2001-
Molecular and Cellular Biology, 2005-
Molecular Carcinogenesis, 2007-
Nature Genetics, 2002-
Nature Medicine, 2002-
Nucleic Acids Research, 2001-

Member:

University of Michigan Cellular and Molecular Biology Program
University of Michigan Comprehensive Cancer Center
University of Michigan Center for Organogenesis

GRANT SUPPORT

Current:

NIH; National Institute of Arthritis, Musculoskeletal, and Skin Diseases
Principal Investigator
“Molecular Regulation of Hair Follicle Morphogenesis”
R01 AR045973-08
04/01/05 – 02/28/10
\$208,600 direct costs annually

NIH; National Cancer Institute
Principal Investigator
“Molecular Basis of Epithelial Skin Cancer”
R01 CA087837-07
4/02/05-02/28/10
\$212,500 direct costs annually

NIH; National Cancer Institute
Principal Investigator
“Hedgehog signaling in upper digestive tract malignancy”
R01 CA118875-01A2
7/13/07-5/31/12
\$ 190,000 direct costs annually

NIH; National Institute of Arthritis, Musculoskeletal, and Skin Diseases
Mentor
“Training Grant in Cell and Molecular Dermatology” (James T. Elder, PI)
T32 AR007197-30
05/01/02-04/30/08
\$164,441 direct costs annually

NIH; National Institute of Child Health and Human Development
Mentor
“Training Program in Organogenesis” (Deborah L. Gumucio, PI)
T32 HD 007505
05/01/07-04/30/12
\$308,000 direct costs annually

NIH: National Institute of General Medical Sciences
Mentor
“Cellular and Molecular Biology at Michigan” (Jessica Schwartz, PI)
T32 GM007315-31
07/01/75-06/30/12
\$577,808 direct costs annually

Pending:

NIH; National Institute of Diabetes and Digestive and Kidney Diseases
Project Director: *Hedgehog Signaling in Stomach Development, Homeostasis, and Disease*
“Cellular Decisions of Differentiation in the GI Tract” (Juanita Merchant, PI)
P01 DK062041
08/01/08-07/31/13
\$1,145,822 total direct costs requested
P01 Priority Score: 136

NIH; National Institute of Arthritis, Musculoskeletal, and Skin Diseases
Subgrant
“A study of Biological Function of Basonuclin” (Hung Tseng, PI)
R01 AR054982
12/01/08-11/30/13
\$66,019 total direct costs requested

Helen L. Kay Charitable Trust
“The Hedgehog Pathway in Cancer Development and Maintenance”
08/01/08-07/30/08
\$57,816 total direct costs requested

Past:

Pfizer, Inc.
Principal Investigator
“Hedgehog Signaling in *De Novo* Skin Appendage Formation and Proliferation of Mature Hair Matrix Cells”
Research Grant
10/01/06-04/07/07
\$175,000

NIH; National Cancer Institute
Principal Investigator
“Molecular Basis of Epithelial Skin Cancer- Function and Therapeutic Targeting of Gli2: Competing Supplement”
R01 CA87837-02S1
4/1/02-6/30/04
\$200,000 direct costs annually

NIH; National Cancer Institute
Principal Investigator
“Molecular Basis of Epithelial Skin Cancer: Administrative Supplement”
R01 CA87837-02S2
9/30/00-6/30/03
\$35,811 direct costs annually

CERTIFICATION AND LICENSURE

Certification: American Board of Dermatology, 10/88

Licensure: Michigan Board of Medicine, Physician License, expiration date 1/31/10
Michigan Board of Pharmacy, Controlled Substance License, expiration date 1/31/10
U.S. DEA registration, expiration date 6/30/09

HONORS AND AWARDS

- 1993 Thomas B. Fitzpatrick Research Award
- 1999 Proctor and Gamble Lectureship, Department of Dermatology, University of Cincinnati, “Role of the Sonic Hedgehog Pathway in Hair Follicle Biology and Skin Tumorigenesis,” June 6, 1999.
- 2000 29th Annual Louis A. Duhring Memorial Lecture, 33rd Annual Meeting of the Pennsylvania Academy of Dermatology, Hershey, PA, “Molecular Basis of Basal Cell Carcinoma,” September 15-17, 2000.
- 2001 Howard Fox Lecturer, Department of Dermatology, New York University, New York, NY, “Hedgehog Signaling in Skin Development and Neoplasia,” January 25, 2001.
- 2002 American Society for Clinical Investigation, Elected Member
- 2003 Best Doctors in America
- 2005 SID/Galderma Acne Research Award
- 2005 American Dermatological Association, Elected Member
- 2007 Best Doctors in America

MEMBERSHIPS AND OFFICES IN PROFESSIONAL SOCIETIES

American Association for Cancer Research
American Society for Clinical Investigation
American Academy of Dermatology
Michigan Dermatological Society
North American Hair Research Society
Society for Investigative Dermatology

TEACHING ACTIVITIES

Lectures

- “Sonic Hedgehog Signaling in Skin Development and Neoplasia,” University of Michigan Cancer Biology Training Program Research Seminar, 1998.
- “Essential Role for Shh in Hair Follicle Morphogenesis,” University of Michigan Center for Organogenesis Seminar Series, 1998.

- “Hedgehogs, Hair Follicles, and Basal Cell Carcinomas,” University of Michigan, Cell and Developmental Biology Seminar Series, 2001.
- “Hedgehog Signaling in Skin-Appendage Growth, Regeneration, and Cancer,” University of Michigan Center for Organogenesis Seminar Series, 2002.
- “Hedgehog Signaling in Cutaneous and Oral Pathology,” University of Michigan School of Dentistry, Center for Craniofacial Research, April, 2004.
- “Exploring the Hedgehog Signaling Pathway Using Mouse Models,” University of Michigan, ULAM Veterinary Residents and Faculty Lecture, October, 2004.
- “Genetically-engineered Mice and Human Skin Disease”, Henry Ford Health System, residents lecture, 2005.
- “Modeling Hedgehog-Driven Tumorigenesis in Mice”, University of Michigan Comprehensive Cancer Center Research Symposium, November 2005
- “Hedgehog signaling in development, regeneration, and cancer”, University of Michigan, Department of Nephrology lecture, December 2005
- “Hedgehog signaling in regeneration and cancer”, University of Michigan, Apoptosis “Work in Progress” lecture series, April 2006

Courses

- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 1997
- “Sexually Transmitted Diseases,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 1998.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 1998.
- “Structure and Function of Skin: More than Meets the Eye,” University of Michigan Center for Organogenesis Graduate Course, 1999.
- “Regulation of Skin Appendage Development by *Sonic Hedgehog*,” University of Michigan Center for Organogenesis Graduate Course, 1999.
- “Development of Epithelial Skin Tumors,” University of Michigan Center for Organogenesis Graduate Course, 1999.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 1999.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2000.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2001.
- “Hedgehogs, Hair Follicles, and Basal Cell Carcinomas,” University of Michigan, Pathology 581 Graduate Course, Molecular Basis of Disease, 2002.
- “Hedgehog Signaling,” University of Michigan, Cell and Developmental Biology 580 Graduate Course, Principles of Development, 2002.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2002.
- “Hedgehog Signaling in Development and Disease,” University of Michigan, Pathology 581 Graduate Course, Molecular Basis of Disease, 2003.
- “Epidermal Stem Cells,” University of Michigan, Cell and Developmental Biology 580 Graduate Course, Principles of Development, 2003.

- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2003.
- “Epithelial Stem Cells in Skin,” Organogenesis of Complex Tissues (Cell and Developmental Biology 683-685), 2004.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2004.
- “Immunobullous and Mechanobullous Diseases,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2004.
- “Modeling Hedgehog-associated cancer in mice,” Department of Cell & Developmental Biology Seminar Series, 2005.
- “Hedgehog, development and cancer,” University of Michigan, Pathology 581, 2005
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2005.
- “Hedgehog signaling in cutaneous biology and cancer,” University of Michigan, Pathology 581, 2006.
- “Non-Melanoma Skin Cancer,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2006.
- “Immunobullous and Mechanobullous Diseases,” Core Curriculum for Second-Year Medical Students, University of Michigan Medical School, 2006.
- “Cutaneous Stem Cells”, University of Michigan, Organogenesis and Stem Cells, CDB 683, Organogenesis of Complex Tissues, 2006.
- “Hedgehog Signaling in Development and Cancer”, University of Michigan, Center for Organogenesis, CDB 680, Organogenesis of Complex Tissues, 2007

Course Director

- “Organogenesis of a Complex Tissue- Skin Development,” University of Michigan Center for Organogenesis Graduate Course (ACB 680), 1999.

Grand Rounds Presentations

- “Role of the *Sonic Hedgehog* Signaling Pathway in Skin: At the Crossroads of Development and Cancer,” University of Michigan Comprehensive Cancer Center Grand Rounds, 1998.
- “Basal Cell Carcinoma: Models and Super Models,” Grand Rounds, Department of Dermatology, University of Pennsylvania, Philadelphia, PA, February 10, 2000.
- “Hedgehog signaling in hair follicle biology and cancer,” Emory University, Department of Dermatology Grand Rounds, January 23, 2003.
- “Hedgehogs, skin biology, and disease,” Yale University, Department of Dermatology Grand Rounds, January 21, 2004.
- “Hedgehogs, hair follicles, and skin cancer,” University of California at San Francisco, School of Medicine, Department of Dermatology Grand Rounds, April 14, 2004.
- “From lab bench to clinic with a hedgehog”, Henry Ford Health System, Grand Rounds, March 9, 2005.

Departmental Seminars

- “Regulation of Epidermal Differentiation,” University of Michigan, Department of Dermatology Residents’ Lecture, 1998.

- “Hair Follicle Development and Dysfunction,” University of Michigan, Department of Dermatology Residents’ Lecture, 1998.
- “Molecular Basis of Skin Cancer,” University of Michigan, Department of Dermatology, Residents’ Lecture, 1999.
- “Keratinocyte Differentiation and Skin Disease,” University of Michigan, Department of Dermatology, Residents’ Lecture, 2000.
- “Hedgehogs, Mice, & BCCs,” University of Michigan, Department of Dermatology, Residents’ Lecture, 2001.
- “Molecular Basis of BCC: from Bench to Bedside with a Hedgehog,” University of Michigan, Department of Dermatology Residents’ Lecture, 2002.
- “Hedgehogs, Hair Follicles and BCCs,” University of Michigan, Department of Dermatology Residents’ Lecture, 2002.
- “Hedgehogs, Hair Follicles, & BCCs,” University of Michigan, Department of Dermatology, Residents’ Lecture, 2003.
- “Genetically-engineered mice and what they can teach us about human skin”, University of Michigan, Department of Dermatology, Dermatology Dialogues, 2005.
- “Hedgehog signaling and head and neck cancer”, University of Michigan, Head and Neck Spore Meeting, 2005.
- “Immunobullous and Mechanobullous Disease,” University of Michigan, Department of Dermatology, Residents’ Lecture, 2005.
- “Update on BCCs and the Hedgehog Pathway in Cancer”, University of Michigan, Department of Dermatology, 2005.
- “Hedgehog signaling in tumor initiation and maintenance,” University of Michigan Comprehensive Cancer Center Stem Cell Seminar Series, 2006.
- “Immunobullous Disease” University of Michigan, Department of Dermatology Residents’ lecture, 2006

Memberships in University of Michigan Academic Programs and Centers

- Cellular and Molecular Biology/Program in Biomedical Sciences
- Center for Organogenesis
- Comprehensive Cancer Center
- Michigan Gastrointestinal Peptide Research Center
- Nathan Shock Center of Excellence in Basic Biology of Aging
- Training Grant in Cell and Molecular Dermatology

Attending Physician

University of Michigan Dermatology Clinic, 1997-

Dissertation Committees

- David Van Mater (Mentor: Eric Fearon, Internal Medicine/Human Genetics/Pathology)
- Theresa Hyun (Mentor: Theo Ross, Internal Medicine-Hematology Oncology)
- Eve Kruger (Mentor: Sean Morrison, Internal Medicine/Cell & Developmental Biology)
- Sarah Bradley (Mentor: Theo Ross, Internal Medicine-Hematology Oncology)
- Blair Madison (Mentor: Deb Gumucio, Cell & Developmental Biology)
- Xing Li (Mentor: Deb Gumucio, Cell & Developmental Biology)
- Abdo Najy (Mentor: Mark Day, Surgery-Urology)

Joe Dosch (Mentor: Charles Burant, Internal Medicine)
Mark Kiel (Mentor: Sean Morrison, Internal Medicine/Cell & Developmental Biology)
Ann Grosse (Mentor: Deborah Gumucio, Cell & Molecular Biology)
Meg Waghray (Mentor: Juanita Merchant, Internal Medicine/Molecular and Integrative Physiology)
William Zacharias (Mentor: Deborah Gumucio, Cell & Molecular Biology)
Jiandong Liu (Mentor: Rolf Bodmer, Molecular, Cell & Developmental Biology)
Shenghui He (Mentor: Sean Morrison, Internal Medicine/Cell & Developmental Biology)
Conrad Valdez (Mentor: Mark Day, Surgery-Urology)

Preliminary Examination Committees

Michael Friedman (Mentor: Craig Logsdon, Physiology)
Teresa Hyun (Mentor: Theo Ross, Internal Medicine-Hematology Oncology)
Sarah Bradley (Mentor: Theo Ross, Internal Medicine-Hematology Oncology)
Brendan Looyenga, Committee Chair (Mentor: Gary Hammer, Internal Medicine/Physiology)
Mike Corradetti (Mentor: Theo Ross, Internal Medicine-Hematology Oncology)

Mentoring

University of Michigan Trainees

Evan Michael: MSTP Research Rotation; MSTP Trainee (PhD Thesis Defense 06/08)
Steve Hoseong Yang: MSTP Research Rotation; MSTP Trainee (PhD Thesis Defense 08/08)
Ryan Swan: Undergraduate Laboratory Research Rotation
Jason Waldinger: Undergraduate Laboratory Research Rotation
Sara Goich: Undergraduate Laboratory Research Rotation
Rashmi Baragi: Undergraduate Research Opportunity Program
Teri Hammock: Undergraduate Research Opportunity Program
Donelle Cummings: Undergraduate Research Opportunity Program
Rachel Ramaswamy: Undergraduate Research Opportunity Program
Erica Dashner: Undergraduate Research Opportunity Program
Daniel Kim: Undergraduate Volunteer
Masoud Ahmadmehrabi: Postgraduate Volunteer
Mei Gei: Medical Student Laboratory Research Elective
Brian Bonish: Medical Student Laboratory Research Elective
Rachel Gustin: Medical Student Laboratory Research Elective
Laurie Linden: Medical Student Laboratory Research Elective
Marina Grachtchouk: Postdoctoral Fellow
Vladimir Grachtchouk: Postdoctoral Fellow
Alexandre Ermilov: Postdoctoral Fellow
Qi Ding: Postdoctoral Fellow
Hong Sheng: Postdoctoral Fellow
Muhammed Kariapper: Postdoctoral Fellow
Mark Hutchin: Postdoctoral Fellow
David Van Mater: MSTP (Predoctoral) Trainee (Fearon Lab)
Nate Lanning: Pre-doctoral Research Rotation
Lekshmi Nair: Undergraduate Research Rotation

National Institutes of Health Trainees (1988-95)

Alpa Dharia: High School Student

Li Man: High School Student

Thomas Miller: Predoctoral Trainee

Joan Wiss: Predoctoral Trainee

Avinash Narayana: Predoctoral Trainee

Matthew Bolinger: Predoctoral Trainee

Yun-sil Lee: Postdoctoral Fellow

Teaching Conferences

“Molecular Pathogenesis of Basal Cell Carcinoma,” Michigan Dermatological Society Meeting, University of Michigan, 1998.

“The Hedgehog Signaling Pathway in Hair Follicle Biology and Neoplasia,” Michigan Dermatological Society Meeting, University of Michigan, 2000.

“The Hedgehog Signaling Pathway in Skin: New Insights into Hair Follicle Biology and Cancer,” Oregon Dermatological Society Meeting, 2001.

“New Insights into Hair Follicle Biology and Neoplasia,” Michigan Dermatological Society Meeting, University of Michigan, 2004.

“Hedgehog Signaling in Biology and Disease: More than Skin Deep,” Michigan Dermatological Society Meeting, University of Michigan, 2006.

EXTRAMURAL INVITED PRESENTATIONS

1. “The role of protein kinase C in epidermal differentiation and carcinogenesis,” The Environmental Threat to the Skin, University of Wales, Cardiff, UK, invited speaker, April 14-17, 1991.
2. Fifth Conference on Differentiation Therapy of Cancer, Sardinia, Italy, invited speaker, 1992.
3. “The differentiation program of normal and neoplastic keratinocytes is regulated by protein kinase C, a new target for cutaneous pharmaceuticals,” Kao Corporation, Tochigi, Japan, invited speaker, October 27, 1993.
4. American Academy of Dermatology, Annual Meeting, invited speaker, 1993.
5. “Growth factors in wound-healing,” session co-chairperson, Society for Investigative Dermatology Annual Meeting, 1994.
6. The Ninth Aspen Cancer Conference Workshop: Mechanisms of Toxicity and Carcinogenesis, Aspen, Colorado, July, 1994.
7. “Staurosporine as an antitumor agent in skin,” American Academy of Dermatology, Annual Meeting, invited speaker, 1995.
8. “Skin protein kinases,” Gordon Research Conference on Epithelial Differentiation and Keratinization, Tilton, NH, invited speaker, 1995.
9. World Dermatology Update and Tokyo Dermatology Association Meeting, Tokyo, Japan, invited speaker, 1996.
10. “Involvement of EGFR in postnatal skin development and epidermal neoplasia induced by the *v-ras*^{Ha} oncogene,” Molecular Biology of Skin and Skin Diseases, Madrid, Spain, invited speaker, June 17-19, 1996.

11. Advances in the biology of the skin: pharmacology and toxicology, University of Medicine and Dentistry of New Jersey, Piscataway, NJ, invited speaker, 1996.
12. "Growth Factors and the Skin," 19th World Congress of Dermatology, Sydney, Australia, 1997. Signal Transduction/Carcinogenesis, session co-chairperson, Society for Investigative Dermatology Annual Meeting, 1997.
13. "Keratinization and its disorders - A molecular perspective," Tumorigenesis Session Chair, Bornheim, Germany, 1998.
14. "Sonic hedgehog function is required during hair follicle morphogenesis," invited speaker, Experimental Skin Carcinogenesis: 3rd International Conference, Bastrop, TX, November 2-4, 1998.
15. "Essential role for sonic hedgehog during hair follicle morphogenesis," invited speaker, Workshop on Epithelial-Mesenchymal Interactions, Second Intercontinental Meeting of Hair Research Societies, Washington, DC, 1998.
16. "Sonic and skin: how a hedgehog makes hair," Children's Memorial Institute for Education and Research and the Cancer Center of Northwestern University, Chicago, IL, invited speaker, April 26, 1999.
17. Hair Follicle Morphogenesis/Carcinogenesis Minisymposium, Introductory lecture and session co-chair, Society for Investigative Dermatology Annual Meeting, Chicago, IL, invited speaker, 1999.
18. "Sonic hedgehog signaling in skin development," Cardinal Bernardin Cancer Center, Loyola University, Chicago, IL, invited speaker, June 10, 1999.
19. "Sonic and skin development: how a hedgehog makes hair," Program for Developmental Biology, Hospital for Sick Children, Toronto, Canada, invited speaker, June 21-23, 1999.
20. "Hedgehog, hair follicles, hamartomas and epitheliomas," Hair Research Society Annual Meeting, Chicago, IL, Keynote Speaker, October 10, 2000.
21. "Hedgehog signaling in skin development and neoplasia," Department of Dermatology, University of Washington, Seattle, WA, invited speaker, August 7, 2000.
22. "Sonic hedgehog signaling in cutaneous development, regeneration and neoplasia," Gordon Research Conference on Developmental Physiology, Plymouth, NH, invited speaker, 2000.
23. "Hedgehogs, hair follicles and hamartomas," 33rd Annual Meeting, Pennsylvania Academy of Dermatology, Hershey, PA, Duhring Professor, February 10, 2000.
24. "Overexpression of the transcription factor Gli2 is sufficient for basal cell carcinoma development in mice," Experimental Skin Carcinogenesis: 4th International Conference, Tucson, AZ, invited speaker, November 9-11, 2000.
25. "Gli2 mediates Shh signaling in skin," University of Cincinnati, Department of Molecular Genetics, Biochemistry, and Molecular Biology, guest speaker, October 10, 2000.
26. "Hedgehogs, hair follicles, hamartomas, and epitheliomas," Dermatology Branch, National Cancer Institute, Bethesda, MD, guest speaker, September 28, 2000.
27. "Hedgehogs, hair follicles, and basal cell carcinomas," Isis Pharmaceuticals, invited speaker, March 8, 2001.
28. Carcinogenesis Minisymposium, session co-chairperson, Society for Investigative Dermatology Annual Meeting, 2001.
29. "Dissecting the oncogenic function of Gli2 in skin," Oregon Health & Science University, Department of Dermatology, October 10, 2001.

30. "Hedgehog signaling in hair follicle development, cycling and cancer," Boden Research Conference on Developmental Cutaneous Biology, Stradbroke Island, Australia, April 14-18 2002.
31. "Hedgehog signaling in hair follicle growth and tumorigenesis," Cutaneous Biology Research Center Seminar Series, Harvard University, invited speaker, September 23, 2002.
32. "The hedgehog signaling pathway in skin: new insights into hair follicle biology and cancer," 4th International Research Workshop on Alopecia Areata, Washington, DC, invited speaker, October, 2002.
33. "Hedgehog signaling in hair follicle biology and cancer," University of Pennsylvania, Philadelphia, PA, March 11, 2003.
34. "Novel models for BCC: what can we learn from mice?," Symposium on Gorlin Syndrome, Nevoid Basal Cell Carcinoma Syndrome, and Basal Cell Carcinoma Syndrome, Miami, FL, invited speaker, April 30, 2003.
35. "Hedgehog signaling in hair follicle growth and neoplasia," Gordon Research Conference on Epithelial Differentiation and Keratinization, Tilton, NH, invited speaker, July 14 April 14-18, 2003.
36. "Hedgehog signaling in hair follicle growth, cancer, and cell fate decisions," Yale University Department of Dermatology, Beeson Lecture Series, January 21, 2004.
37. "Hedgehog signaling in skin biology and cancer," Distinguished Scientist Seminar Series, North Carolina State University College of Veterinary Medicine, December, 2004.
38. "Hedgehog signaling in skin biology and disease," Pfizer Pharmaceuticals, October, 2004.
39. "Hedgehog signaling requirements in hair follicles and basal cell carcinomas," Montagna Symposium, October, 2004.
40. "From Lab Bench to Clinic with a Hedgehog," Grand Rounds, Department of Dermatology, Henry Ford Health System, Detroit, MI, March 9, 2005.
41. "Hedgehog Signaling and Sebocyte Development", Society of Investigative Dermatology Meeting, Advances in Acne Research, St. Louis, MO, May 4, 2005
42. "Hedgehog signaling in skin biology and cancer," Mouse Models of Human Cancers Consortium Epidermal Stem Cells Meeting, Winter Park CO, August 25, 2005
43. "Hedgehog signaling in skin biology and disease", Galderma R & D, Sophia Antipolis, France, November 21, 2005
44. "Hedgehog signaling in tumor initiation and maintenance," Cancer Stem Cells, Banbury Center, CSHL, December 4-7, 2005.
45. "Hedgehog signaling in tumor initiation and maintenance," University of Chicago Committee on Cancer Biology, December 21, 2005.
46. "Hedgehog signaling in tumor initiation and maintenance," International Conference on Stem Cells and Cancer, DKFZ, Heidelberg, Germany, March 12-14, 2006.
47. "Hedgehog signaling in skin appendage biology and cancer", Infinity Pharmaceuticals, Inc., Cambridge, MA, March 20, 2006.
48. Plenary Session II, Hair and Cutaneous Development minisymposium session co-chairperson, Society for Investigative Dermatology Annual Meeting, 2006.
49. "Hair and Cutaneous Development" Clinical Scholars Program, Society for Investigative Dermatology Annual Meeting, 2006.
50. "Hedgehog signaling in tumor initiation and maintenance", EMBO workshop on Hedgehog-Gli Signaling in Cancer and Stem Cells, Rome, Italy, October 3, 2006.

51. "Hedgehog signaling in skin appendage development and cancer", Montagna Symposium on the Biology of Skin, Oregon, October 12, 2006.
52. "Hedgehog signaling in cancer initiation", 7th International Skin Carcinogenesis Conference, Smithville, TX, November 10, 2006.
53. "Hedgehog signaling in skin biology and cancer", Korean Dermatological Association, Ulsan, Korea, April 19, 2007.
54. "Hedgehog signaling in skin biology and tumorigenesis", State-of-the-Art Plenary Lecture, Society for Investigative Dermatology Annual Meeting, 2007.
55. "Hedgehog functions in the pilosebaceous unit", Fifth International Congress of Hair Research, Vancouver, British Columbia, Canada, June 15, 2007.
56. "Hedgehog signaling in tumor initiation and maintenance", Gordon Research Conference, Smithfield, RI, July 30, 2007.
57. "Hedgehog signaling in skin development and cancer", Developmental Biology Day, Department of Cell Biology, University of Alabama at Birmingham, November 9, 2007.

COMMITTEE AND ADMINISTRATIVE SERVICE

National

- 2006 Co-organizer, Montagna Symposium on the Biology of Skin Signaling to Structures: Skin Appendages, Development and Disease
- 2005- Dermatology Foundation, Scientific Review Committee
- 2004- Society for Investigative Dermatology, Committee on Scientific Programs
Society for Investigative Dermatology Scientific Committee, Reviewer
- 2000 NIH, National Institute of Arthritis, Musculoskeletal, and Skin Diseases
Roundtable Participant

University

- 2007- Cell & Molecular Biology Program Committee
- 2006,07 Organogenesis International Symposium Planning Committee
- 2001,02 University Committee on the Use and Care of Animals
- 2001 Transgenic Core Steering Committee

Medical School

- 2001-05 Institutional Review Board
- 2001-04 Comprehensive Cancer Center Cancer Research Committee

Department

- 2000- Chair, Cutaneous Oncology Faculty Search Committee
- 1997- Residency Selection Committee

PATENTS

- US Patent #6,689,937: Transgenic animal model of basal cell carcinoma
- US Patent #7,056,908: Pharmaceutical compositions and methods for preventing skin tumor formation and causing regression of existing tumors

BIBLIOGRAPHY

Peer-Reviewed Publications

1. Croop J, Toyama Y, **Dlugosz AA**, and Holtzer H. Selective effects of phorbol 12-myristate 13-acetate on myofibrils and 10-nm filaments. *Proc Natl Acad Sci USA* 77:5273-5277, 1980.
2. Croop J, Dubyak G, Toyama Y, **Dlugosz A**, Scarpa A, and Holtzer H. Effects of 12-0-tetradecanoylphorbol-13-acetate on myofibril integrity and Ca²⁺ content in developing myotubes. *Dev Biol* 89:460-474, 1982.
3. Tato F, Alema S, **Dlugosz A**, Boettiger D, Holtzer H, Cossu G, and Pacifici M. Development of 'revertant' myotubes in cultures of Rous sarcoma virus transformed avian myogenic cultures. *Differentiation* 24:131-139, 1983.
4. **Dlugosz AA**, Tapscott SJ, and Holtzer H. Effects of phorbol 12-myristate 13-acetate on the differentiation program of embryonic chick skeletal myoblasts. *Cancer Res* 43:2780-2789, 1983.
5. **Dlugosz AA**, Antin PB, Nachmias VT, and Holtzer H. The relationship between stress fiber-like structures and nascent myofibrils in cultured cardiac myocytes. *J Cell Biol* 99:2268-2278, 1984.
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