

Stanford




Anthony Oro, MD, PhD

Eugene and Gloria Bauer Professor

Dermatology

 NIH Biosketch available Online

 Curriculum Vitae available Online

CLINICAL OFFICES

- **Adult Dermatology Clinic**

450 Broadway St

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- **Medical Dermatology**

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ACADEMIC CONTACT INFORMATION

- **Administrative Contact**

Inna Gitman - Admin Assistant

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Bio

BIO

Anthony E. Oro, M.D., Ph.D., is the Eugene and Gloria Bauer Professor of Dermatology, Associate Director of the Center for Definitive and Curative Medicine, and the co-director of the Child Health Research Institute. He is co-founder of the Program in Epithelial Biology, and an active member of the Institute for Stem Cell Biology and Regenerative Medicine, Children's Health Research Institute, Bio-X, and the Program in Cancer Biology. His research interests encompass cancer genomics and tumor evolution, stem cell biology and hair/skin development and regeneration, and definitive molecular and cellular therapeutics. His clinical interests include hair biology, non-melanoma skin cancer, and stem cell-based therapies for genetic skin diseases.

CLINICAL FOCUS

- Cancer > Cutaneous (Dermatologic) Oncology
- Dermatology
- Skin Cancer
- Hair disorders
- Genetic Skin Disease
- Epidermolysis Bullosa
- Therapeutic Reprograming
- Therapeutic Reprogramming
- Stem Cell
- Regenerative Medicine

ACADEMIC APPOINTMENTS

- Professor, Dermatology
- Member, Bio-X
- Member, Institute for Stem Cell Biology and Regenerative Medicine
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Assoc Director, Center for Definitive and Curative Medicine, (2016- present)
- Co-Director, Child Health Research Institute, (2017- present)

PROFESSIONAL EDUCATION

- Medical Education: University of California San Diego School of Medicine (1993) CA
- Residency: Stanford University Dermatology Residency (1997) CA
- Internship: Stanford University Internal Medicine Residency (1994) CA
- Board Certification: Dermatology, American Board of Dermatology (1998)

LINKS

- Personal Web site: <http://orolab.stanford.edu>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our lab studies skin stem cells to understand mechanisms of tissue regeneration and carcinogenesis. We have a longstanding interest in the mechanisms of Sonic hedgehog (Shh) signaling in the hair follicle and in the pathogenesis of the most common human tumor, basal cell carcinoma (BCCs) of the skin. We have provided clinical evidence for the first hedgehog pathway inhibitor and are developing novel targets for next generation inhibitors that target the transcription factor Gli. We are studying the mechanisms of tumor evolution and the development of chemoresistance to targeted agents in both patients and mouse models using genomics and bioinformatic methods followed by functional validation.

We are also interested in the mechanisms of human skin development and early ectodermal differentiation and have developed in vitro human skin differentiation from embryonic stem cells. Using this system, we are exploring how early ectoderm commits to stratified epithelium. We have used our system, in collaboration with other labs at Stanford, to manufacture corrected human epidermal sheets from patient-specific iPS cells.

CLINICAL TRIALS

- Characteristics of Patients With Recessive Dystrophic Epidermolysis Bullosa, Recruiting
- A Phase I Study of IPI-926 in Patients With Advanced and/or Metastatic Solid Tumor Malignancies, Not Recruiting
- A Phase II Study of Efficacy and Safety in Patients With Locally Advanced or Metastatic Basal Cell Carcinoma, Not Recruiting
- A Study Evaluating the Efficacy and Safety of Vismodegib (GDC-0449, Hedgehog Pathway Inhibitor) in Patients With Advanced Basal Cell Carcinoma, Not Recruiting
- A Study in Advanced Cancer, Not Recruiting
- A Study of Vismodegib (GDC-0449) in Patients Treated With Vismodegib in a Previous Genentech-sponsored Phase I or II Cancer Study, Not Recruiting
- A Study of Vismodegib (GDC-0449) in Patients With Locally Advanced or Metastatic Basal Cell Carcinoma, Not Recruiting

- Arsenic Trioxide in Treating Patients With Basal Cell Carcinoma, Not Recruiting
- Levocarnitine in Treating Patients With Vismodegib-Associated Muscle Spasms, Not Recruiting
- Pilot LDE225 in Locally Advanced or Metastatic BCC + Previously Tx Non-LDE225 Smoothened Inhibitors, Not Recruiting
- Pilot Study of Sonidegib and Buparlisib in Treating Patients With Advanced or Metastatic Basal Cell Carcinoma, Not Recruiting
- Tofacitinib for the Treatment of Alopecia Areata and Its Variants, Not Recruiting
- Topical Itraconazole in Treating Patients With Basal Cell Cancer, Not Recruiting
- Vismodegib in Treating Patients With Basal Cell Carcinoma (BCC), Not Recruiting

Teaching

STANFORD ADVISEES

Med Scholar Project Advisor

Candice Kim, Carmel McCullough

Doctoral Dissertation Reader (AC)

Tony Boutelle, Derek Le, Victor Naturale, Ron Shanderson, Yan Ting Shue, Xue Yang

Orals Chair

César Márquez

Postdoctoral Faculty Sponsor

Alessandro Bailetti, Ann Collier, Daniel Haensel, Ying Yang

Doctoral Dissertation Advisor (AC)

Maria Gonzalez, Yanzhe Li, Angela Liu

Postdoctoral Research Mentor

Alessandro Bailetti, Ann Collier, Daniel Haensel, Ying Yang

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)
- Biomedical Informatics (Phd Program)
- Cancer Biology (Phd Program)
- Dermatology (Fellowship Program)
- Genetics (Phd Program)
- Stem Cell Biology and Regenerative Medicine (Phd Program)

Publications

PUBLICATIONS

- **The Sky's the LEMit: New insights into nuclear structure regulation of transcription factor activity.** *Current opinion in cell biology*
Mirza, A. N., Gonzalez, F., Ha, S. K., Oro, A. E.
2020; 68: 173–80
- **AP-1 and TGFSS cooperativity drives non-canonical Hedgehog signaling in resistant basal cell carcinoma.** *Nature communications*
Yao, C. D., Haensel, D., Gaddam, S., Patel, T., Atwood, S. X., Sarin, K. Y., Whitson, R. J., McKellar, S., Shankar, G., Aasi, S., Rieger, K., Oro, A. E.
2020; 11 (1): 5079

- **Loss of primary cilia drives switching from Hedgehog to Ras/MAPK pathway in resistant basal cell carcinoma.** *The Journal of investigative dermatology*
Kuonen, F., Huskey, N. E., Shankar, G., Jaju, P., Whitson, R. J., Rieger, K. E., Atwood, S. X., Sarin, K. Y., Oro, A. E.
2019
- **TFAP2C- and p63-Dependent Networks Sequentially Rearrange Chromatin Landscapes to Drive Human Epidermal Lineage Commitment.** *Cell stem cell*
Li, L., Wang, Y., Torkelson, J. L., Shankar, G., Pattison, J. M., Zhen, H. H., Fang, F., Duren, Z., Xin, J., Gaddam, S., Melo, S. P., Piekos, S. N., Li, et al
2019
- **MTSS1/Src family kinase dysregulation underlies multiple inherited ataxias.** *Proceedings of the National Academy of Sciences of the United States of America*
Brown, A. S., Meera, P., Altindag, B., Chopra, R., Perkins, E. M., Paul, S., Scoles, D. R., Tarapore, E., Magri, J., Huang, H., Jackson, M., Shakkottai, V. G., Otis, et al
2018
- **LAP2 Proteins Chaperone GLII Movement between the Lamina and Chromatin to Regulate Transcription.** *Cell*
Mirza, A. N., McKellar, S. A., Urman, N. M., Brown, A. S., Hollmig, T., Aasi, S. Z., Oro, A. E.
2018
- **Retinoic acid and BMP4 cooperate with p63 to alter chromatin dynamics during surface epithelial commitment.** *Nature genetics*
Pattison, J. M., Melo, S. P., Piekos, S. N., Torkelson, J. L., Bashkirova, E., Mumbach, M. R., Rajasingh, C., Zhen, H. H., Li, L., Liaw, E., Alber, D., Rubin, A. J., Shankar, et al
2018
- **Frequent basal cell cancer development is a clinical marker for inherited cancer susceptibility** *JCI INSIGHT*
Cho, H. G., Kuo, K. Y., Li, S., Bailey, I., Aasi, S., Chang, A. S., Oro, A. E., Tang, J. Y., Sarin, K. Y.
2018; 3 (15)
- **Noncanonical hedgehog pathway activation through SRF-MKL1 promotes drug resistance in basal cell carcinomas.** *Nature medicine*
Whitson, R. J., Lee, A. n., Urman, N. M., Mirza, A. n., Yao, C. Y., Brown, A. S., Li, J. R., Shankar, G. n., Fry, M. A., Atwood, S. X., Lee, E. Y., Hollmig, S. T., Aasi, et al
2018; 24 (3): 271–81
- **Soil Primes the Seed: Epigenetic Landscape Drives Tumor Behavior.** *Cell stem cell*
Whitson, R. J., Oro, A. E.
2017; 20 (2): 149-150
- **Combined inhibition of atypical PKC and histone deacetylase 1 is cooperative in basal cell carcinoma treatment.** *JCI insight*
Mirza, A. N., Fry, M. A., Urman, N. M., Atwood, S. X., Roffey, J. n., Ott, G. R., Chen, B. n., Lee, A. n., Brown, A. S., Aasi, S. Z., Hollmig, T. n., Ator, M. A., Dorsey, et al
2017; 2 (21)
- **Safety and efficacy of the JAK inhibitor tofacitinib citrate in patients with alopecia areata.** *JCI insight*
Kennedy Crispin, M., Ko, J. M., Craiglow, B. G., Li, S., Shankar, G., Urban, J. R., Chen, J. C., Cerise, J. E., Jabbari, A., Winge, M. C., Marinkovich, M. P., Christiano, A. M., Oro, et al
2016; 1 (15)
- **Smoothed variants explain the majority of drug resistance in Basal cell carcinoma.** *Cancer cell*
Atwood, S. X., Sarin, K. Y., Whitson, R. J., Li, J. R., Kim, G., Rezaee, M., Ally, M. S., Kim, J., Yao, C., Chang, A. L., Oro, A. E., Tang, J. Y.
2015; 27 (3): 342-353
- **Human COL7A1-corrected induced pluripotent stem cells for the treatment of recessive dystrophic epidermolysis bullosa** *SCIENCE TRANSLATIONAL MEDICINE*
Sebastiano, V., Zhen, H. H., Derafshi, B. H., Bashkirova, E., Melo, S. P., Wang, P., Leung, T. L., Siprashvili, Z., Tichy, A., Li, J., Ameen, M., Hawkins, J., Lee, et al
2014; 6 (264)
- **Epigenetic targeting of Hedgehog pathway transcriptional output through BET bromodomain inhibition** *NATURE MEDICINE*
Tang, Y., Gholamin, S., Schubert, S., Willardson, M. I., Lee, A., Bandopadhyay, P., Bergthold, G., Masoud, S., Nguyen, B., Vue, N., Balansay, B., Yu, F., Oh, et al
2014; 20 (7): 732-740

- **Somatic Correction of Junctional Epidermolysis Bullosa by a Highly Recombinogenic AAV Variant.** *Molecular therapy : the journal of the American Society of Gene Therapy*
Melo, S. P., Lisowski, L., Bashkirova, E., Zhen, H. H., Chu, K., Keene, D. R., Marinkovich, M. P., Kay, M. A., Oro, A. E.
2014; 22 (4): 725-733
- **"Atypical" regulation of Hedgehog-dependent cancers.** *Cancer cell*
Atwood, S. X., Oro, A. E.
2014; 25 (2): 133-134
- **State-dependent signaling by Cav1.2 regulates hair follicle stem cell function.** *Genes & development*
Yucel, G., Altindag, B., Gomez-Ospina, N., Rana, A., Panagiotakos, G., Lara, M. F., Dolmetsch, R., Oro, A. E.
2013; 27 (11): 1217-1222
- **GLI activation by atypical protein kinase C γ regulates the growth of basal cell carcinomas.** *Nature*
Atwood, S. X., Li, M., Lee, A., Tang, J. Y., Oro, A. E.
2013; 494 (7438): 484-488
- **GLI activation by atypical protein kinase C δ regulates the growth of basal cell carcinomas** *NATURE*
Atwood, S. X., Li, M., Lee, A., Tang, J. Y., Oro, A. E.
2013; 494 (7438): 484-488
- **Hedgehog pathway inhibition and the race against tumor evolution** *JOURNAL OF CELL BIOLOGY*
Atwood, S. X., Chang, A. L., Oro, A. E.
2013: 45-49
- **Efficacy and Safety of Vismodegib in Advanced Basal-Cell Carcinoma** *NEW ENGLAND JOURNAL OF MEDICINE*
Sekulic, A., Migden, M. R., Oro, A. E., Dirix, L., Lewis, K. D., Hainsworth, J. D., Solomon, J. A., Yoo, S., Arron, S. T., Friedlander, P. A., Marmor, E., Rudin, C. M., Chang, et al
2012; 366 (23): 2171-2179
- **Translocation Affecting Sonic Hedgehog Genes in Basal-Cell Carcinoma** *NEW ENGLAND JOURNAL OF MEDICINE*
Gomez-Ospina, N., Chang, A. L., Qu, K., Oro, A. E.
2012; 366 (23): 2233-2234
- **Shh maintains dermal papilla identity and hair morphogenesis via a Noggin-Shh regulatory loop** *GENES & DEVELOPMENT*
Woo, W., Zhen, H. H., Oro, A. E.
2012; 26 (11): 1235-1246
- **SnapShot: Hair Follicle Stem Cells** *CELL*
Woo, W., Oro, A. E.
2011; 146 (2): 334-U159
- **MIM and Cortactin Antagonism Regulates Ciliogenesis and Hedgehog Signaling** *DEVELOPMENTAL CELL*
Bershteyn, M., Atwood, S. X., Woo, W., Li, M., Oro, A. E.
2010; 19 (2): 270-283
- **I-BAR protein antagonism of endocytosis mediates directional sensing during guided cell migration** *JOURNAL OF CELL BIOLOGY*
Quinones, G. A., Jin, J., Oro, A. E.
2010; 189 (2): 353-367
- **Starve a cold, and perhaps a cancer.** *Nature cell biology*
Haensel, D., Oro, A. E.
2020
- **Receptor protein tyrosine phosphatases control Purkinje neuron firing.** *Cell cycle (Georgetown, Tex.)*
Brown, A. S., Meera, P., Quinones, G., Magri, J., Otis, T. S., Pulst, S. M., Oro, A. E.
2019: 1-7
- **Loss of Primary Cilia Drives Switching from Hedgehog to Ras/MAPK Pathway in Resistant Basal Cell Carcinoma** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*

- Kuonen, F., Huskey, N. E., Shankar, G., Jaju, P., Whitson, R. J., Rieger, K. E., Atwood, S. X., Sarin, K. Y., Oro, A. E.
2019; 139 (7): 1439–48
- **Genetic mutations underlying phenotypic plasticity in basosquamous carcinoma** *Journal of Investigative Dermatology*
Chiang, A., Tan, C. Z., Kuonen, F., Hodgkinson, L. M., Chiang, F., Cho, R. J., South, A. P., Tang, J. Y., Chang, A. L., Rieger, K. E., Oro, A. E., Sarin, K. Y.
2019
 - **Actin polymerization controls cilia-mediated signaling** *JOURNAL OF CELL BIOLOGY*
Drummond, M. L., Li, M., Tarapore, E., Nguyen, T. L., Barouni, B. J., Cruz, S., Tan, K. C., Oro, A. E., Atwood, S. X.
2018; 217 (9): 3255–66
 - **TGF-beta, Fibronectin and Integrin alpha5beta1 Promote Invasion in Basal Cell Carcinoma.** *The Journal of investigative dermatology*
Kuonen, F., Surbeck, I., Sarin, K. Y., Dontenwill, M., Ruegg, C., Gilliet, M., Oro, A. E., Gaide, O.
2018
 - **Tumor-Derived Suppressor of Fused Mutations Reveal Hedgehog Pathway Interactions** *PLOS ONE*
Urman, N. M., Mirza, A., Atwood, S. X., Whitson, R. J., Sarin, K. Y., Tang, J. Y., Oro, A. E.
2016; 11 (12)
 - **Factors That May Promote an Effective Local Research Environment** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*
Wang, K., Lee, C. S., Marinkovich, M., Chang, H. Y., Oro, A. E., Khavari, P. A.
2016; 136 (8): 1529–31
 - **Update to an open-label clinical trial of vismodegib as neoadjuvant before surgery for high-risk basal cell carcinoma (BCC)** *JOURNAL OF THE AMERICAN ACADEMY OF DERMATOLOGY*
Kwon, G. P., Ally, M., Bailey-Healy, I., Oro, A. E., Kim, J., Chang, A., Aasi, S., Tang, J. Y.
2016; 75 (1): 213–15
 - **Effects of Combined Treatment With Arsenic Trioxide and Itraconazole in Patients With Refractory Metastatic Basal Cell Carcinoma.** *JAMA dermatology*
Ally, M. S., Ransohoff, K., Sarin, K., Atwood, S. X., Rezaee, M., Bailey-Healy, I., Kim, J., Beachy, P. A., Chang, A. L., Oro, A., Tang, J. Y., Colevas, A. D.
2016; 152 (4): 452-456
 - **An Investigator-Initiated Open-Label Trial of Sonidegib in Advanced Basal Cell Carcinoma Patients Resistant to Vismodegib** *CLINICAL CANCER RESEARCH*
Danial, C., Sarin, K. Y., Oro, A. E., Chang, A. L.
2016; 22 (6): 1325-1329
 - **Effects of combined treatment with arsenic trioxide and itraconazole in patients with refractory metastatic basal cell carcinoma** *JAMA Dermatology*
Sarin, K. Y., Ally, M. S., Ransohoff, K. J., Atwood, S. X., Rezaee, M.
2016: 1–5
 - **Rolling the Genetic Dice: Neutral and Deleterious Smoothed Mutations in Drug-Resistant Basal Cell Carcinoma.** *journal of investigative dermatology*
Atwood, S. X., Sarin, K. Y., Li, J. R., Yao, C. Y., Urman, N. M., Chang, A. L., Tang, J. Y., Oro, A. E.
2015; 135 (8): 2138-2141
 - **An investigator-initiated open-label clinical trial of vismodegib as a neoadjuvant to surgery for high-risk basal cell carcinoma.** *Journal of the American Academy of Dermatology*
Ally, M. S., Aasi, S., Wysong, A., Teng, C., Anderson, E., Bailey-Healy, I., Oro, A., Kim, J., Chang, A. L., Tang, J. Y.
2014; 71 (5): 904-911 e1
 - **Advanced treatment for basal cell carcinomas.** *Cold Spring Harbor perspectives in medicine*
Atwood, S. X., Whitson, R. J., Oro, A. E.
2014; 4 (7)
 - **Epigenetic targeting of Hedgehog pathway transcriptional output through BET bromodomain inhibition.** *Nature medicine*
Tang, Y., Gholamin, S., Schubert, S., Willardson, M. I., Lee, A., Bandopadhyay, P., Bergthold, G., Masoud, S., Nguyen, B., Vue, N., Balansay, B., Yu, F., Oh, et al
2014; 20 (7): 732-740
 - **Partial Proteasome Inhibitors Induce Hair Follicle Growth by Stabilizing β -Catenin.** *Stem cells*
Yucel, G., Van Arnem, J., Means, P. C., Huntzicker, E., Altindag, B., Lara, M. F., Yuan, J., Kuo, C., Oro, A. E.

2014; 32 (1): 85-92

- **Augmenting Endogenous Wnt Signaling Improves Skin Wound Healing** *PLOS ONE*
Whyte, J. L., Smith, A. A., Liu, B., Manzano, W. R., Evans, N. D., Dhamdhare, G. R., Fang, M. Y., Chang, H. Y., Oro, A. E., Helms, J. A.
2013; 8 (10)
- **Rapid Genetic Analysis of Epithelial-Mesenchymal Signaling During Hair Regeneration** *JOVE-JOURNAL OF VISUALIZED EXPERIMENTS*
Woo, W., Atwood, S. X., Zhen, H. H., Oro, A. E.
2013
- **Rapid genetic analysis of epithelial-mesenchymal signaling during hair regeneration.** *Journal of visualized experiments : JoVE*
Woo, W., Atwood, S. X., Zhen, H. H., Oro, A. E.
2013
- **Hedgehog pathway inhibition and the race against tumor evolution** *JOURNAL OF CELL BIOLOGY*
Atwood, S. X., Chang, A. L., Oro, A. E.
2012; 199 (2): 193-197
- **A perivascular stem cell niche in the hair follicle** *75th Annual Meeting of the Society-for-Investigative-Dermatology*
Xiao, Y., Woo, W., Terunuma, A., Oro, A. E., Vogel, J. C., Brownell, I.
NATURE PUBLISHING GROUP.2012: S79-S79
- **Neuropilins are positive regulators of Hedgehog signal transduction** *GENES & DEVELOPMENT*
Hillman, R. T., Feng, B. Y., Ni, J., Woo, W., Milenkovic, L., Gephart, M. G., Teruel, M. N., Oro, A. E., Chen, J. K., Scott, M. P.
2011; 25 (22): 2333-2346
- **In Vivo Imaging of Human and Mouse Skin with a Handheld Dual-Axis Confocal Fluorescence Microscope** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*
Ra, H., Piyawattanametha, W., Gonzalez-Gonzalez, E., Mandella, M. J., Kino, G. S., Solgaard, O., Leake, D., Kaspar, R. L., Oro, A., Contag, C. H.
2011; 131 (5): 1061-1066
- **Cell Migration: GSK3 beta Steers the Cytoskeleton's Tip** *CELL*
Yucel, G., Oro, A. E.
2011; 144 (3): 319-321
- **Laminin-511 and integrin beta-1 in hair follicle development and basal cell carcinoma formation** *BMC DEVELOPMENTAL BIOLOGY*
DeRouen, M. C., Zhen, H., Tan, S. H., Williams, S., Marinkovich, M. P., Oro, A. E.
2010; 10
- **BAR domain competition during directional cellular migration** *CELL CYCLE*
Quinones, G. A., Oro, A. E.
2010; 9 (13): 2522-2528
- **The Primary Cilium: A Small Yet Mighty Organelle** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*
DeRouen, M. C., Oro, A. E.
2009; 129 (2): 264-265
- **Laminin-511 is an epithelial message promoting dermal papilla development and function during early hair morphogenesis** *GENES & DEVELOPMENT*
Gao, J., DeRouen, M. C., Chen, C., Nguyen, M., Nguyen, N. T., Ido, H., Harada, K., Sekiguchi, K., Morgan, B. A., Miner, J. H., Oro, A. E., Marinkovich, M. P.
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- **Controlling hair follicle signaling pathways through polyubiquitination** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*
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2008; 128 (5): 1081-1087
- **Role of the Basement Membrane Zone in Skin Development.** *journal of investigative dermatology*
Oro, A. E.
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- **A new role for an old friend: NFAT and stem cell quiescence** *CELL STEM CELL*
Oro, A. E.

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- **Role of the basement membrane zone in skin development.** *journal of investigative dermatology*
Oro, A. E.
2008; 128 (E2): E11-2
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Oro, A. E.
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- **Bone morphogenetic protein antagonist gremlin 1 is widely expressed by cancer-associated stromal cells and can promote tumor cell proliferation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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- **Dual degradation signals control Gli protein stability and tumor formation** *GENES & DEVELOPMENT*
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- **Mammalian variations on a theme: a Smo and Sufu surprise** *DEVELOPMENTAL CELL*
Oro, A. E.
2006; 10 (2): 156-158
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- **Receptor tyrosine phosphatase-dependent cytoskeletal remodeling by the hedgehog-responsive gene MIM/BEG4** *66th Annual Meeting of the Society-for-Investigative-Dermatology*
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- **Receptor tyrosine phosphatase-dependent cytoskeletal remodeling by the hedgehog-responsive gene MIM/BEG4** *JOURNAL OF CELL BIOLOGY*
Gonzalez-Quevedo, R., Shoffer, M., Horng, L., Oro, A. E.
2005; 168 (3): 453-463
- **MIM/BEG4, a Sonic hedgehog-responsive gene that potentiates Gli-dependent transcription** *GENES & DEVELOPMENT*
Callahan, C. A., Ofstad, T., Horng, L., Wang, J. K., Zhen, H. H., Coulombe, P. A., Oro, A. E.
2004; 18 (22): 2724-2729
- **Laminin-10 is crucial for hair morphogenesis** *EMBO JOURNAL*
Li, J., Tzu, J., Chen, Y., Zhang, Y. P., Nguyen, N. T., Gao, J., Bradley, M., Keene, D. R., Oro, A. E., Miner, J. H., Marinkovich, M. P.
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- **Hair cycle regulation of Hedgehog signal reception** *DEVELOPMENTAL BIOLOGY*
Oro, A. E., Higgins, K.
2003; 255 (2): 238-248
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Aszterbaum, M., Epstein, J., Oro, A., Douglas, V., LeBoit, P. E., Scott, M. P., Epstein, E. H.
1999; 5 (11): 1285-1291
- **Hedgehog/patched signaling in animal development and disease**
Scott, M. P., Goodrich, L. V., Higgins, K. M., Johnson, R. L., Milenkovic, L., Oro, A. E.
FEDERATION AMER SOC EXP BIOL.1997: A1302-A1302
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Fan, H., Oro, A. E., Scott, M. P., Khavari, P. A.
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- **MOLECULAR ANALYSIS OF THE INHERITANCE AND STABILITY OF THE MITOCHONDRIAL GENOME OF AN INBRED LINE OF MAIZE** *THEORETICAL AND APPLIED GENETICS*

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