Stanford



Philip Beachy

The Ernest and Amelia Gallo Professor, Professor of Urology, of Developmental Biology and, by courtesy, of Chemical and Systems Biology

CONTACT INFORMATION

- **Administrative Contact**

  Valerie Hyun-Hee Park - Administrative Associate 3

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Bio

ACADEMIC APPOINTMENTS

- Professor, Urology
- Professor, Developmental Biology
- Professor (By courtesy), Chemical and Systems Biology
- 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

- Director, Siebel Investigator Program, Institute for Stem Cell Biology and Regenerative Medicine, (2016- present)

HONORS AND AWARDS

- Katharine Berkan Judd Award for Cancer Research, Sloan Kettering Institute (2016)
- Keio Medical Science Prize, Keio University, Japan (2011)
- March of Dimes Prize in Developmental Biology, March of Dimes Birth Defects Foundation (2008)
- Fellow, American Academy of Arts and Sciences (2003)
- Member, National Academy of Sciences (2002)
- National Academy of Sciences Award in Molecular Biology, National Academy of Sciences (1998)
- Outstanding Young Scientist Award, Maryland Academy of Sciences (1997)

PROFESSIONAL EDUCATION

- Ph.D., Stanford University , Biochemistry (1986)
- B.S., Goshen College, Goshen, Indiana , Natural Sciences (1979)

LINKS

- Beachy Lab: https://pbeachy.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My lab studies the function of Hedgehog proteins and other extracellular signals in morphogenesis (pattern formation) and in injury repair and regeneration (pattern maintenance). We study how the distribution of such signals is regulated in tissues, how cells perceive and respond to distinct concentrations of signals, and how such signaling pathways arose in evolution. We also study the normal roles of such signals in stem-cell physiology and their abnormal roles in the formation and expansion of cancer stem cells.

Teaching

COURSES

2026-27

- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

2025-26

- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

2024-25

- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

2023-24

- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Seungyeon LEE, Mallory Laboulaye, Ye Tian, Jingyu Zhao

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (PhD Program)
- Developmental Biology (PhD Program)
- Stem Cell Biology and Regenerative Medicine (PhD Program)

Publications

PUBLICATIONS

- **Neuroendocrine cells orchestrate regeneration through Desert hedgehog signaling.** *Cell*
  Kong, W., Lu, W. J., Dubey, M., Suryawanshi, R. K., Vijayakumar, S., Jeong, Y., Gombar, S., Diehn, M., Shin, K., Ott, M., Chien, Y. H., Sarin, K. Y., Desai, et al
  2025
- **Cellular and molecular mechanisms of Hedgehog signalling.** *Nature reviews. Molecular cell biology*
  Zhang, Y., Beachy, P. A.
  2023
- **Dispatched uses Na+ flux to power release of lipid-modified Hedgehog.** *Nature*
  Wang, Q., Asarnow, D. E., Ding, K., Mann, R. K., Hatakeyama, J., Zhang, Y., Ma, Y., Cheng, Y., Beachy, P. A.

2021

- **Hedgehog pathway activation through nanobody-mediated conformational blockade of the Patched sterol conduit.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhang, Y., Lu, W., Bulkley, D. P., Liang, J., Ralko, A., Han, S., Roberts, K. J., Li, A., Cho, W., Cheng, Y., Manglik, A., Beachy, P. A.
  2020
- **Smoothened stimulation by membrane sterols drives Hedgehog pathway activity.** *Nature*
  Deshpande, I., Liang, J., Hedeen, D., Roberts, K. J., Zhang, Y., Ha, B., Latorraca, N. R., Faust, B., Dror, R. O., Beachy, P. A., Myers, B. R., Manglik, A.
  2019
- **Structural Basis for Cholesterol Transport-like Activity of the Hedgehog Receptor Patched.** *Cell*
  Zhang, Y., Bulkley, D. P., Xin, Y., Roberts, K. J., Asarnow, D. E., Sharma, A., Myers, B. R., Cho, W., Cheng, Y., Beachy, P. A.
  2018
- **Cilia-Associated Oxysterols Activate Smoothened.** *Molecular cell*
  Raleigh, D. R., Sever, N., Choksi, P. K., Sigg, M. A., Hines, K. M., Thompson, B. M., Elnatan, D., Jaishankar, P., Bisignano, P., Garcia-Gonzalo, F. R., Krup, A. L., Eberl, M., Byrne, et al
  2018; 72 (2): 316
- **Neuronal delivery of Hedgehog directs spatial patterning of taste organ regeneration.** *Proceedings of the National Academy of Sciences of the United States of America*
  Lu, W. J., Mann, R. K., Nguyen, A. n., Bi, T. n., Silverstein, M. n., Tang, J. Y., Chen, X. n., Beachy, P. A.
  2018; 115 (2): E200–E209
- **Single-cell transcriptomics of 20 mouse organs creates a Tabula Muris.** *Nature*
  2018; 562 (7727): 367–72
- **Hedgehog mediated degradation of Ihog adhesion proteins modulates cell segregation in Drosophila wing imaginal discs** *NATURE COMMUNICATIONS*
  Hsia, E. Y. C., Zhang, Y., Tran, H., Lim, A., Chou, Y., Lan, G., Beachy, P. A., Zheng, X.
  2017; 8: 1275
- **Stromal Gli2 activity coordinates a niche signaling program for mammary epithelial stem cells** *SCIENCE*
  Zhao, C., Cai, S., Shin, K., Lim, A., Kalisky, T., Lu, W., Clarke, M. F., Beachy, P. A.
  2017; 356 (6335): 284-?
- **The Stromal Niche for Epithelial Stem Cells: A Template for Regeneration and a Brake on Malignancy.** *Cancer cell*
  Roberts, K. J., Kershner, A. M., Beachy, P. A.
  2017; 32 (4): 404–10
- **Rapid, direct activity assays for Smoothened reveal Hedgehog pathway regulation by membrane cholesterol and extracellular sodium.** *Proceedings of the National Academy of Sciences of the United States of America*
  Myers, B. R., Neahring, L. n., Zhang, Y. n., Roberts, K. J., Beachy, P. A.
  2017; 114 (52): E11141–E11150
- **Control of inflammation by stromal Hedgehog pathway activation restrains colitis.** *Proceedings of the National Academy of Sciences of the United States of America*
  Lee, J. J., Rothenberg, M. E., Seeley, E. S., Zimdahl, B., Kawano, S., Lu, W., Shin, K., Sakata-Kato, T., Chen, J. K., Diehn, M., Clarke, M. F., Beachy, P. A.
  2016
- **Hedgehog Signaling Restrains Bladder Cancer Progression by Eliciting Stromal Production of Urothelial Differentiation Factors** *CANCER CELL*
  Shin, K., Lim, A., Zhao, C., Sahoo, D., Pan, Y., Spiekerkoetter, E., Liao, J. C., Beachy, P. A.
  2014; 26 (4): 521-533
- **Stromal response to Hedgehog signaling restrains pancreatic cancer progression.** *Proceedings of the National Academy of Sciences of the United States of America*
  Lee, J. J., Perera, R. M., Wang, H., Wu, D., Liu, X. S., Han, S., Fitamant, J., Jones, P. D., Ghanta, K. S., Kawano, S., Nagle, J. M., Deshpande, V., Boucher, et al

2014; 111 (30): E3091-100

- **Identification of recurrent SMO and BRAF mutations in ameloblastomas.** *Nature genetics*
  Sweeney, R. T., McClary, A. C., Myers, B. R., Biscocho, J., Neahring, L., Kwei, K. A., Qu, K., Gong, X., Ng, T., Jones, C. D., Varma, S., Odegaard, J. I., Sugiyama, et al
  2014; 46 (7): 722-725

- **Cellular origin of bladder neoplasia and tissue dynamics of its progression to invasive carcinoma.** *Nature cell biology*
  Shin, K., Lim, A., Odegaard, J. I., Honeycutt, J. D., Kawano, S., Hsieh, M. H., Beachy, P. A.
  2014; 16 (5): 469-478

- **Simultaneous measurement of smoothened entry into and exit from the primary cilium.** *PloS one*
  Kim, J., Hsia, E. Y., Kim, J., Sever, N., Beachy, P. A., Zheng, X.
  2014; 9 (8)

- **Hedgehog pathway modulation by multiple lipid binding sites on the smoothened effector of signal response.** *Developmental cell*
  Myers, B. R., Sever, N., Chong, Y. C., Kim, J., Belani, J. D., Rychnovsky, S., Bazan, J. F., Beachy, P. A.
  2013; 26 (4): 346-357

- **Scube/You activity mediates release of dually lipid-modified Hedgehog signal in soluble form** *GENES & DEVELOPMENT*
  Creanga, A., Glenn, T. D., Mann, R. K., Saunders, A. M., Talbot, W. S., Beachy, P. A.
  2012; 26 (12): 1312-1325

- **Structure of the protein core of the glypican Dally-like and localization of a region important for hedgehog signaling** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kim, M., Saunders, A. M., Hamaoka, B. Y., Beachy, P. A., Leahy, D. J.
  2011; 108 (32): 13112-13117

- **Hedgehog/Wnt feedback supports regenerative proliferation of epithelial stem cells in bladder** *NATURE*
  Shin, K., Lee, J., Guo, N., Kim, J., Lim, A., Qu, L., Mysorekar, I. U., Beachy, P. A.
  2011; 472 (7341): 110-U145

- **Hedgehog-responsive candidate cell of origin for diffuse intrinsic pontine glioma** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Monje, M., Mitra, S. S., Freret, M. E., Raveh, T. B., Kim, J., Masek, M., Attema, J. L., Li, G., Haddix, T., Edwards, M. S., Fisher, P. G., Weissman, I. L., Rowitch, et al
  2011; 108 (11): 4453-4458

- **Interactions between Hedgehog proteins and their binding partners come into view** *GENES & DEVELOPMENT*
  Beachy, P. A., Hymowitz, S. G., Lazarus, R. A., Leahy, D. J., Siebold, C.
  2010; 24 (18): 2001-2012

- **Arsenic antagonizes the Hedgehog pathway by preventing ciliary accumulation and reducing stability of the Gli2 transcriptional effector** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kim, J., Lee, J. J., Kim, J., Gardner, D., Beachy, P. A.
  2010; 107 (30): 13432-13437

- **Itraconazole, a Commonly Used Antifungal that Inhibits Hedgehog Pathway Activity and Cancer Growth** *CANCER CELL*
  Kim, J., Tang, J. Y., Gong, R., Kim, J., Lee, J. J., Clemons, K. V., Chong, C. R., Chang, K. S., Fereshteh, M., Gardner, D., Reya, T., Liu, J. O., Epstein, et al
  2010; 17 (4): 388-399

- **Dally-like core protein and its mammalian homologues mediate stimulatory and inhibitory effects on Hedgehog signal response** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Williams, E. H., Pappano, W. N., Saunders, A. M., Kim, M., Leahy, D. J., Beachy, P. A.
  2010; 107 (13): 5869-5874

- **Genetic and biochemical definition of the Hedgehog receptor** *GENES & DEVELOPMENT*
  Zheng, X., Mann, R. K., Sever, N., Beachy, P. A.
  2010; 24 (1): 57-71

- **Gli2 trafficking links Hedgehog-dependent activation of Smoothened in the primary cilium to transcriptional activation in the nucleus** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kim, J., Kato, M., Beachy, P. A.
  2009; 106 (51): 21666-21671
- **The mode of Hedgehog binding to Ihog homologues is not conserved across different phyla** *NATURE*
  McLellan, J. S., Zheng, X., Hauk, G., Ghirlando, R., Beachy, P. A., Leahy, D. J.
  2008; 455 (7215): 979-U62
- **Oxysterols pathway in are novel activators of the hedgehog pluripotent mesenchymal cells** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Dwyer, J. R., Sever, N., Carlson, M., Nelson, S. F., Beachy, P. A., Parhami, F.
  2007; 282 (12): 8959-8968
- **Structure of a heparin-dependent complex of hedgehog and Ihog** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  McLellan, J. S., Yao, S., Zheng, X., Geisbrecht, B. V., Ghirlando, R., Beachy, P. A., Leahy, D. J.
  2006; 103 (46): 17208-17213
- **Prevalence of off-target effects in Drosophila RNA interference screens** *NATURE*
  Ma, Y., Creanga, A., Lum, L., Beachy, P. A.
  2006; 443 (7109): 359-363
- **A genomewide screen for components of the RNAi pathway in Drosophila cultured cells** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Dorner, S., Lum, L., Kim, M., Paro, R., Beachy, P. A., Green, R.
  2006; 103 (32): 11880-11885
- **The ihog cell-surface proteins bind hedgehog and mediate pathway activation** *CELL*
  Yao, S. Q., Lum, L., Beachy, P.
  2006; 125 (2): 343-357
- **Defective cerebellar response to mitogenic Hedgehog signaling in Down's syndrome mice** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Roper, R. J., Baxter, L. L., Saran, N. G., Klinedinst, D. K., Beachy, P. A., Reeves, R. H.
  2006; 103 (5): 1452-1456
- **Molecular mechanisms of Sonic hedgehog mutant effects in holoprosencephaly** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Maity, T., Fuse, N., Beachy, P. A.
  2005; 102 (47): 17026-17031
- **Extensive phosphorylation of Smoothened in Hedgehog pathway activation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Zhang, C., Williams, E. H., Guo, Y., Lum, L., Beachy, P. A.
  2004; 101 (52): 17900-17907
- **Tissue repair and stem cell renewal in carcinogenesis** *NATURE*
  Beachy, P. A., Karhadkar, S. S., Berman, D. M.
  2004; 432 (7015): 324-331
- **Mending and malignancy** *NATURE*
  Beachy, P. A., Karhadkar, S. S., Berman, D. M.
  2004; 431 (7007): 402-402
- **The Hedgehog response network: Sensors, switches, and routers** *SCIENCE*
  Lum, L., Beachy, P. A.
  2004; 304 (5678): 1755-1759
- **Novel lipid modifications of secreted protein signals** *ANNUAL REVIEW OF BIOCHEMISTRY*
  Mann, R. K., Beachy, P. A.

2004; 73: 891-923

- **Hedgehog signal transduction via smoothened association with a cytoplasmic complex scaffolded by the atypical kinesin, Costal-2** *MOLECULAR CELL*
  Lum, L., Zhang, C., Oh, S., Mann, R. K., von Kessler, D. P., Taipale, J., Weis-Garcia, F., Gong, R. Y., Wang, B. L., Beachy, P. A.
  2003; 12 (5): 1261-1274
- **A defective response to Hedgehog signaling in disorders of cholesterol biosynthesis** *NATURE GENETICS*
  Cooper, M. K., Wassif, C. A., Krakowiak, P. A., Taipale, J., Gong, R. Y., Kelley, R. I., Porter, F. D., Beachy, P. A.
  2003; 33 (4): 508-513
- **Identification of Hedgehog pathway components by RNAi in Drosophila cultured cells** *SCIENCE*
  Lum, L., Yao, S. Q., Mozer, B., Rovescalli, A., Von Kessler, D., Nirenberg, M., Beachy, P. A.
  2003; 299 (5615): 2039-2045
- **Hedgehog signalling within airway epithelial progenitors and in small-cell lung cancer** *NATURE*
  Watkins, D. N., Berman, D. M., Burkholder, S. G., Wang, B. L., Beachy, P. A., BAYLIN, S. B.
  2003; 422 (6929): 313-317
- **Inhibition of Hedgehog signaling by direct binding of cyclopamine to Smoothened** *GENES & DEVELOPMENT*
  Chen, J. K., Taipale, J., Cooper, M. K., Beachy, P. A.
  2002; 16 (21): 2743-2748
- **Small molecule modulation of Smoothened activity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Chen, J. K., Taipale, J., Young, K. E., Maiti, T., Beachy, P. A.
  2002; 99 (22): 14071-14076
- **Hedgehog-mediated patterning of the mammalian embryo requires transporter-like function of dispatched** *CELL*
  Ma, Y., Erkner, A., Gong, R. Y., Yao, S. Q., Taipale, J., Basler, K., Beachy, P. A.
  2002; 111 (1): 63-75
- **Medulloblastoma growth inhibition by Hedgehog pathway blockade** *SCIENCE*
  Berman, D. M., Karhadkar, S. S., Hallahan, A. R., Pritchard, J. I., Eberhart, C. G., Watkins, D. N., Chen, J. K., Cooper, M. K., Taipale, J., Olson, J. M., Beachy, P. A.
  2002; 297 (5586): 1559-1561
- **Patched acts catalytically to suppress the activity of Smoothened** *NATURE*
  Taipale, J., Cooper, M. K., Maiti, T., Beachy, P. A.
  2002; 418 (6900): 892-897
- **Skinny Hedgehog, an acyltransferase required for palmitoylation and activity of the Hedgehog signal** *SCIENCE*
  Chamoun, Z., Mann, R. K., Nellen, D., von Kessler, D. P., Bellotto, M., Beachy, P. A., Basler, K.
  2001; 293 (5537): 2080-2084
- **The Hedgehog and Wnt signaling pathways in cancer** *NATURE*
  Taipale, J., Beachy, P. A.
  2001; 411 (6835): 349-354
- **Cholesterol modification of proteins** *BIOCHIMICA ET BIOPHYSICA ACTA-MOLECULAR AND CELL BIOLOGY OF LIPIDS*
  Mann, R. K., Beachy, P. A.
  2000; 1529 (1-3): 188-202
- **Effects of oncogenic mutations in Smoothened and Patched can be reversed by cyclopamine** *NATURE*
  Taipale, J., Chen, J. K., Cooper, M. K., Wang, B. L., Mann, R. K., Milenkovic, L., Scott, M. P., Beachy, P. A.
  2000; 406 (6799): 1005-1009
- **Hedgehog-regulated processing of Gli3 produces an anterior/posterior repressor gradient in the developing vertebrate limb** *CELL*
  Wang, B. L., Fallon, J. F., Beachy, P. A.
  2000; 100 (4): 423-434

- **Sonic hedgehog protein signals not as a hydrolytic enzyme but as an apparent ligand for Patched** *National Academy of Sciences Colloquium on Proteolytic Processing and Physiological Regulation*
  Fuse, N., Maiti, T., Wang, B. L., Porter, J. A., Hall, T. M., Leahy, D. J., Beachy, P. A.
  NATL ACAD SCIENCES.1999: 10992–99
- **Nuclear trafficking of cubitus interruptus in the transcriptional regulation of hedgehog target gene expression** *CELL*
  Chen, C. H., von Kessler, D. P., Park, W. J., Beachy, P. A.
  1999; 98 (3): 305-316
- **Teratogen-mediated inhibition of target tissue response to Shh signaling** *SCIENCE*
  Cooper, M. K., Porter, J. A., Young, K. E., Beachy, P. A.
  1998; 280 (5369): 1603-1607
- **Crystal structure of a hedgehog autoprocessing domain: Homology between hedgehog and self-splicing proteins** *CELL*
  Hall, T. M., Porter, J. A., Young, K. E., Koonin, E. V., Beachy, P. A., Leahy, D. J.
  1997; 91 (1): 85-97
- **Multiple roles of cholesterol in hedgehog protein biogenesis and signaling** *Cold Spring Harbor Symposium on Quantitative Biology - Pattern Formation During Development*
  Beachy, P. A., Cooper, M. K., Young, K. E., von Kessler, D. P., Park, W. J., Hall, T. M., Leahy, D. J., Porter, J. A.
  COLD SPRING HARBOR LAB PRESS, PUBLICATIONS DEPT.1997: 191–204
- **Cholesterol modification of hedgehog signaling proteins in animal development** *SCIENCE*
  Porter, J. A., Young, K. E., Beachy, P. A.
  1996; 274 (5285): 255-259
- **Cyclopia and defective axial patterning in mice lacking Sonic hedgehog gene function** *NATURE*
  Chiang, C., Ying, L. T., Lee, E., Young, K. E., Corden, J. L., Westphal, H., Beachy, P. A.
  1996; 383 (6599): 407-413
- **Hedgehog patterning activity: Role of a lipophilic modification mediated by the carboxy-terminal autoprocessing domain** *CELL*
  Porter, J. A., Ekker, S. C., Park, W. J., VONKESSLER, D. P., Young, K. E., Chen, C. H., Ma, Y., Woods, A. S., Cotter, R. J., Koonin, E. V., Beachy, P. A.
  1996; 86 (1): 21-34
- **A POTENTIAL CATALYTIC SITE REVEALED BY THE 1.7-ANGSTROM CRYSTAL-STRUCTURE OF THE AMINO-TERMINAL SIGNALING DOMAIN OF SONIC HEDGEHOG** *NATURE*
  Hall, T. M., Porter, J. A., Beachy, P. A., Leahy, D. J.
  1995; 378 (6553): 212-216
- **CONTROL OF DROSOPHILA TRACHEAL BRANCHING BY THE NOVEL HOMEODOMAIN GENE UNPLUGGED, A REGULATORY TARGET FOR GENES OF THE BITHORAX COMPLEX** *DEVELOPMENT*
  CHAING, C., Young, K. E., Beachy, P. A.
  1995; 121 (11): 3901-3912
- **PATTERNING ACTIVITIES OF VERTEBRATE HEDGEHOG PROTEINS IN THE DEVELOPING EYE AND BRAIN** *CURRENT BIOLOGY*
  Ekker, S. C., Ungar, A. R., Greenstein, P., VONKESSLER, D. P., Porter, J. A., MOON, R. T., Beachy, P. A.
  1995; 5 (8): 944-955
- **PATTERNING OF THE NEURAL ECTODERM OF XENOPUS-LAEVIS BY THE AMINO-TERMINAL PRODUCT OF HEDGEHOG AUTOPROTEOLYTIC CLEAVAGE** *DEVELOPMENT*
  Lai, C. J., Ekker, S. C., Beachy, P. A., MOON, R. T.
  1995; 121 (8): 2349-2360
- **DISTINCT EXPRESSION AND SHARED ACTIVITIES OF MEMBERS OF THE HEDGEHOG GENE FAMILY OF XENOPUS-LAEVIS** *DEVELOPMENT*
  Ekker, S. C., McGrew, L. L., Lai, C. J., Lee, J. J., VONKESSLER, D. P., MOON, R. T., Beachy, P. A.
  1995; 121 (8): 2337-2347
- **INDUCTION OF MIDBRAIN DOPAMINERGIC-NEURONS BY SONIC HEDGEHOG** *NEURON*
  Hynes, M., Porter, J. A., Chiang, C., Chang, D., TESSIERLAVIGNE, M., Beachy, P. A., Rosenthal, A.

1995; 15 (1): 35-44

- **LIMB-PATTERNING ACTIVITY AND RESTRICTED POSTERIOR LOCALIZATION OF THE AMINO-TERMINAL PRODUCT OF SONIC HEDGEHOG CLEAVAGE** *CURRENT BIOLOGY*
  LOPEZMARTINEZ, A., Chang, D. T., Chiang, C., Porter, J. A., Ros, M. A., Simandl, B. K., Beachy, P. A., Fallon, J. F.
  1995; 5 (7): 791-796

- **FLOOR PLATE AND MOTOR-NEURON INDUCTION BY DIFFERENT CONCENTRATIONS OF THE AMINO-TERMINAL CLEAVAGE PRODUCT OF SONIC HEDGEHOG AUTOPROTEOLYSIS** *CELL*
  Roelink, H., Porter, J. A., Chiang, C., Tanabe, Y., Chang, D. T., Beachy, P. A., Jessell, T. M.
  1995; 81 (3): 445-455

- **LONG-RANGE SCLEROTOME INDUCTION BY SONIC HEDGEHOG - DIRECT ROLE OF THE AMINO-TERMINAL CLEAVAGE PRODUCT AND MODULATION BY THE CYCLIC-AMP SIGNALING PATHWAY** *CELL*
  Fan, C. M., Porter, J. A., Chiang, C., Chang, D. T., Beachy, P. A., TESSIERLAVIGNE, M.
  1995; 81 (3): 457-465

- **THE PRODUCT OF HEDGEHOG AUTOPROTEOLYTIC CLEAVAGE ACTIVE IN LOCAL AND LONG-RANGE SIGNALING** *NATURE*
  Porter, J. A., VONKESSLER, D. P., Ekker, S. C., Young, K. E., Lee, J. J., Moses, K., Beachy, P. A.
  1995; 374 (6520): 363-366

- **ULTRABITHORAX PROTEIN IS NECESSARY BUT NOT SUFFICIENT FOR FULL ACTIVATION OF DECAPENTAPLEGIC EXPRESSION IN THE VISCERAL MESODERM** *EMBO JOURNAL*
  Sun, B., Hursh, D. A., Jackson, D., Beachy, P. A.
  1995; 14 (3): 520-535

- **AUTOPROTEOLYSIS IN HEDGEHOG PROTEIN BIOGENESIS** *SCIENCE*
  Lee, J. J., Ekker, S. C., VONKESSLER, D. P., Porter, J. A., Sun, B. I., Beachy, P. A.
  1994; 266 (5190): 1528-1537

- **THE NOVEL HOMEODOMAIN GENE BUTTONLESS SPECIFIES DIFFERENTIATION AND AXONAL GUIDANCE FUNCTIONS OF DROSOPHILA DORSAL MEDIAN CELLS** *DEVELOPMENT*
  Chiang, C., Patel, N. H., Young, K. E., Beachy, P. A.
  1994; 120 (12): 3581-3593

- **PRODUCTS, GENETIC-LINKAGE AND LIMB PATTERNING ACTIVITY OF A MURINE HEDGEHOG GENE** *DEVELOPMENT*
  Chang, D. T., Lopez, A., VONKESSLER, D. P., Chiang, C., Simandl, B. K., Zhao, R. B., Seldin, M. F., Fallon, J. F., Beachy, P. A.
  1994; 120 (11): 3339-3353

- **EXPRESSION OF A NOVEL TOLL-LIKE GENE SPANS THE PARASEGMENT BOUNDARY AND CONTRIBUTES TO HEDGEHOG FUNCTION IN THE ADULT EYE OF DROSOPHILA** *MECHANISMS OF DEVELOPMENT*
  Chiang, C., Beachy, P. A.
  1994; 47 (3): 225-239

- **THE DEGREE OF VARIATION IN DNA-SEQUENCE RECOGNITION AMONG 4 DROSOPHILA HOMEOTIC PROTEINS** *EMBO JOURNAL*
  Ekker, S. C., Jackson, D. G., VONKESSLER, D. P., Sun, B. I., Young, K. E., Beachy, P. A.
  1994; 13 (15): 3551-3560

- **THE SEGMENT POLARITY GENE HEDGEHOG IS REQUIRED FOR PROGRESSION OF THE MORPHOGENETIC FURROW IN THE DEVELOPING DROSOPHILA EYE** *CELL*
  Ma, C. Y., Zhou, Y., Beachy, P. A., Moses, K.
  1993; 75 (5): 927-938

- **COOPERATIVE BINDING OF AN ULTRABITHORAX HOMEODOMAIN PROTEIN TO NEARBY AND DISTANT DNA SITES** *MOLECULAR AND CELLULAR BIOLOGY*
  Beachy, P. A., Varkey, J., Young, K. E., VONKESSLER, D. P., Sun, B. I., Ekker, S. C.
  1993; 13 (11): 6941-6956

- **DIFFERENTIAL DNA-SEQUENCE RECOGNITION IS A DETERMINANT OF SPECIFICITY IN HOMEOTIC GENE-ACTION** *EMBO JOURNAL*
  Ekker, S. C., VONKESSLER, D. P., Beachy, P. A.
  1992; 11 (11): 4059-4072

- **SECRETION AND LOCALIZED TRANSCRIPTION SUGGEST A ROLE IN POSITIONAL SIGNALING FOR PRODUCTS OF THE SEGMENTATION GENE HEDGEHOG** *CELL*
  Lee, J. J., VONKESSLER, D. P., Parks, S., Beachy, P. A.
  1992; 71 (1): 33-50

- **OPTIMAL DNA-SEQUENCE RECOGNITION BY THE ULTRABITHORAX HOMEODOMAIN OF DROSOPHILA** *EMBO JOURNAL*
  Ekker, S. C., Young, K. E., VONKESSLER, D. P., Beachy, P. A.
  1991; 10 (5): 1179-1186

- **A MOLECULAR VIEW OF THE ULTRABITHORAX HOMEOTIC GENE OF DROSOPHILA** *TRENDS IN GENETICS*
  Beachy, P. A.
  1990; 6 (2): 46-51

- **AN ULTRABITHORAX PROTEIN BINDS SEQUENCES NEAR ITS OWN AND THE ANTENNAPEDIA P1 PROMOTERS** *CELL*
  Beachy, P. A., Krasnow, M. A., Gavis, E. R., Hogness, D. S.
  1988; 55 (6): 1069-1081

- **SEGMENTAL DISTRIBUTION OF BITHORAX COMPLEX PROTEINS DURING DROSOPHILA DEVELOPMENT** *NATURE*
  Beachy, P. A., Helfand, S. L., Hogness, D. S.
  1985; 313 (6003): 545-551

- **MOLECULAR-GENETICS OF THE BITHORAX COMPLEX IN DROSOPHILA-MELANOGASTER** *SCIENCE*
  Bender, W., Akam, M., KARCH, F., Beachy, P. A., Peifer, M., Spierer, P., Lewis, E. B., Hogness, D. S.
  1983; 221 (4605): 23-29

- **HEDGEHOG PATHWAY INDUCTION FOLLOWING FACIAL NERVE INJURY IN MICE**
  Azimi, T., Faniku, C., Ghorbani, S., Kong, W., Rosiles, G., Beachy, P., Pepper, J.
  WILEY.2024: S136

- **Tert-expressing cells contribute to salivary gland homeostasis and tissue regeneration after radiation therapy.** *Genes & development*
  Guan, L., Viswanathan, V., Jiang, Y., Vijayakumar, S., Cao, H., Zhao, J., Colburg, D. R., Neuhöfer, P., Zhang, Y., Wang, J., Xu, Y., Laseinde, E. E., Hildebrand, et al
  2024

- **Localized application of SAG21k-loaded fibrin hydrogels for targeted modulation of the hedgehog pathway in facial nerve injury.** *International journal of biological macromolecules*
  He, L., Sato, J. E., Sundar, P., Azimi, T., Beachy, P. A., Bekale, L. A., Pepper, J. P.
  2024: 131747

- **An organism-wide atlas of hormonal signaling based on the mouse lemur single-cell transcriptome.** *Nature communications*
  Liu, S., Ezran, C., Wang, M. F., Li, Z., Awayan, K., Long, J. Z., De Vlaminck, I., Wang, S., Epelbaum, J., Kuo, C. S., Terrien, J., Krasnow, M. A., Ferrell, et al
  2024; 15 (1): 2188

- **TARGETING THE HEDGEHOG PATHWAY TRANSCRIPTION EFFECTOR Gli2 IS A NOVEL THERAPEUTIC STRATEGY FOR SEVERE SCHISTOSOMIASIS MANSONI FIBROSIS AND PORTAL HYPERTENSION**
  Pereira, T., Vidigal, P., Diehl, A., Wynn, T., Beachy, P.
  LIPPINCOTT WILLIAMS & WILKINS.2023: S1547-S1548

- **Identification of a minority population of LMO2+ breast cancer cells that integrate into the vasculature and initiate metastasis.** *Science advances*
  Sikandar, S. S., Gulati, G. S., Antony, J., Fetter, I., Kuo, A. H., Ho, W. H., Haro-Acosta, V., Das, S., Steen, C. B., Pereira, T. A., Qian, D., Beachy, P. A., Dirbas, et al
  2022; 8 (45): eabm3548

- **The Tabula Sapiens: A multiple-organ, single-cell transcriptomic atlas of humans.** *Science (New York, N.Y.)*
  Jones, R. C., Karkanias, J., Krasnow, M. A., Pisco, A. O., Quake, S. R., Salzman, J., Yosef, N., Bulthaup, B., Brown, P., Harper, W., Hemenez, M., Ponnusamy, R., Salehi, et al
  2022; 376 (6594): eabl4896

- **Publisher Correction: Cell types of origin of the cell-free transcriptome.** *Nature biotechnology*

Vorperian, S. K., Moufarrej, M. N., Tabula Sapiens Consortium, Quake, S. R., Jones, R. C., Karkanias, J., Krasnow, M., Pisco, A. O., Quake, S. R., Salzman, J., Yosef, N., Bulthaup, B., Brown, P., et al

2022

- **Molecular hallmarks of heterochronic parabiosis at single-cell resolution.** *Nature*

  Palovics, R., Keller, A., Schaum, N., Tan, W., Fehlmann, T., Borja, M., Kern, F., Bonanno, L., Calcuttawala, K., Webber, J., McGeever, A., Tabula Muris Consortium, Luo, J., et al

  2022

- **Cell types of origin of the cell-free transcriptome.** *Nature biotechnology*

  Vorperian, S. K., Moufarrej, M. N., Tabula Sapiens Consortium, Quake, S. R., Jones, R. C., Karkanias, J., Krasnow, M., Pisco, A. O., Quake, S. R., Salzman, J., Yosef, N., Bulthaup, B., Brown, P., et al

  2022

- **Probing restoration of taste receptor cell with engineered nanobodies**

  Lu, W., Zhang, Y., Li, A., Beachy, P. A.

  OXFORD UNIV PRESS.2022

- **RNA splicing programs define tissue compartments and cell types at single-cell resolution** *ELIFE*

  Olivieri, J., Dehghannasiri, R., Wang, P. L., Jang, S., de Morree, A., Tan, S. Y., Ming, J., Wu, A., Consortium, T., Quake, S. R., Krasnow, M. A., Salzman, J.

  2021; 10

- **Toward the restoration of damaged taste organs with a genetically encoded Hedgehog pathway agonist**

  Lu, W., Sivakamasundari, V., Zhang, Y., Li, A., Beachy, P. A.

  OXFORD UNIV PRESS.2021

- **Deconstructing tumor heterogeneity: the stromal perspective.** *Oncotarget*

  Vickman, R. E., Faget, D. V., Beachy, P., Beebe, D., Bhowmick, N. A., Cukierman, E., Deng, W., Granneman, J. G., Hildesheim, J., Kalluri, R., Lau, K. S., Lengyel, E., Lundeberg, et al

  2020; 11 (40): 3621–32

- **A single-cell transcriptomic atlas characterizes ageing tissues in the mouse.** *Nature*

  2020

- **Ageing hallmarks exhibit organ-specific temporal signatures.** *Nature*

  Schaum, N. n., Lehallier, B. n., Hahn, O. n., Pálovics, R. n., Hosseinzadeh, S. n., Lee, S. E., Sit, R. n., Lee, D. P., Losada, P. M., Zardeneta, M. E., Fehlmann, T. n., Webber, J. T., McGeever, et al

  2020

- **Strategies for single-molecule tracking of Sonic Hedgehog delivery to the regenerative niche in adult taste buds**

  Lu, W., Baghel, A., Beachy, P. A.

  OXFORD UNIV PRESS.2019: E61–E62

- **TARGETING THE HEDGEHOG PATHWAY IS A NOVEL THERAPEUTIC STRATEGY TO TREAT SCHISTOSOMIASIS FIBROSIS AND PORTAL HYPERTENSION**

  Pereira, T., Vidigal, P., Voieta, I., Resende, V., Witek, R., Jegga, A., Arron, J., Madala, S., Lambertucci, J., Diehl, A., Wynn, T., Beachy, P.

  AMER SOC TROP MED & HYGIENE.2019: 10–11

- **Targeted disruption of transcriptional effector GLI2 attenuates breast tumor growth and metastasis**

  Beachy, P., Cai, S., Ma, Y., Hatakeyama, J., Zhao, C., Stoffels, M., Verhaegh, W., van de Stolpe, A., Pegram, M.

  AMER ASSOC CANCER RESEARCH.2018

- **Role of KEAP1/NRF2 and TP53 Mutations in Lung Squamous Cell Carcinoma Development and Radiation Resistance.** *Cancer discovery*

  Jeong, Y., Hoang, N. T., Lovejoy, A., Stehr, H., Newman, A. M., Gentles, A. J., Kong, W., Truong, D., Martin, S., Chaudhuri, A., Heiser, D., Zhou, L., Say, et al

  2016

- **Mapping the Pairwise Choices Leading from Pluripotency to Human Bone, Heart, and Other Mesoderm Cell Types** *CELL*

  Loh, K. M., Chen, A., Koh, P. W., Deng, T. Z., Sinha, R., Tsai, J. M., Barkal, A. A., Shen, K. Y., Jain, R., Morganti, R. M., Shyh-Chang, N., Fernhoff, N. B., George, et al

2016; 166 (2): 451-467

- **Endogenous B-ring oxysterols inhibit the Hedgehog component Smoothened in a manner distinct from cyclopamine or side-chain oxysterols** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Sever, N., Mann, R. K., Xu, L., Snell, W. J., Hernandez-Lara, C. I., Porter, N. A., Beachy, P. A.
  2016; 113 (21): 5904-5909

- **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

- **Localized JNK signaling regulates organ size during development** *ELIFE*
  Willsey, H. R., Zheng, X., Pastor-Pareja, J. C., Willsey, A. J., Beachy, P. A., Xu, T.
  2016; 5

- **The role of ciliary trafficking in Hedgehog receptor signaling** *SCIENCE SIGNALING*
  Kim, J., Hsia, E. Y., Brigui, A., Plessis, A., Beachy, P. A., Zheng, X.
  2015; 8 (379)

- **Itraconazole Inhibits Enterovirus Replication by Targeting the Oxysterol-Binding Protein** *CELL REPORTS*
  Strating, J. R., van der Linden, L., Albulescu, L., Bigay, J., Arita, M., Delang, L., Leyssen, P., van der Schaar, H. M., Lanke, K. H., Thibaut, H. J., Ulferts, R., Drin, G., Schlinck, et al
  2015; 10 (4): 600-615

- **Bifurcating action of Smoothened in Hedgehog signaling is mediated by Dlg5.** *Genes & development*
  Chong, Y. C., Mann, R. K., Zhao, C., Kato, M., Beachy, P. A.
  2015; 29 (3): 262-276

- **Corrigendum: Identification of recurrent SMO and BRAF mutations in ameloblastomas.** *Nature genetics*
  Sweeney, R. T., McClary, A. C., Myers, B. R., Biscocho, J., Neahring, L., Kwei, K. A., Qu, K., Gong, X., Ng, T., Jones, C. D., Varma, S., Odegaard, J. I., Sugiyama, et al
  2014; 47 (1): 97-?

- **Spatially restricted Hedgehog signalling regulates HGF-induced branching of the adult prostate** *NATURE CELL BIOLOGY*
  Lim, A., Shin, K., Zhao, C., Kawano, S., Beachy, P. A.
  2014; 16 (12): 1135-U33

- **Identification of recurrent SMO and BRAF mutations in ameloblastomas** *NATURE GENETICS*
  Sweeney, R. T., McClary, A. C., Myers, B. R., Biscocho, J., Neahring, L., Kwei, K. A., Qu, K., Gong, X., Ng, T., Jones, C. D., Varma, S., Odegaard, J. I., Sugiyama, et al
  2014; 46 (7): 722-725

- **Cellular origin of bladder neoplasia and tissue dynamics of its progression to invasive carcinoma** *NATURE CELL BIOLOGY*
  Shin, K., Lim, A., Odegaard, J. I., Honeycutt, J. D., Kawano, S., Hsieh, M. H., Beachy, P. A.
  2014; 16 (5): 469-U194

- **FK506 activates BMPR2, rescues endothelial dysfunction, and reverses pulmonary hypertension.** *journal of clinical investigation*
  Spiekerkoetter, E., Tian, X., Cai, J., Hopper, R. K., Sudheendra, D., Li, C. G., El-Bizri, N., Sawada, H., Haghighat, R., Chan, R., Haghighat, L., de Jesus Perez, V., Wang, et al
  2013; 123 (8): 3600-3613

- **FK506 activates BMPR2, rescues endothelial dysfunction, and reverses pulmonary hypertension.** *journal of clinical investigation*
  Spiekerkoetter, E., Tian, X., Cai, J., Hopper, R. K., Sudheendra, D., Li, C. G., El-Bizri, N., Sawada, H., Haghighat, R., Chan, R., Haghighat, L., de Jesus Perez, V., Wang, et al
  2013; 123 (8): 3600-3613

- **HEDGEHOG PATHWAY INHIBITION ERADICATES THE TUMOR-INITIATING CELL POPULATION IN DIPG, BUT DOES NOT PROLONG SURVIVAL** *15th International Symposium on Pediatric Neuro-Oncology (ISPNO)*
  Monje, M., Freret, M., Mitra, S., Mallick, S., Kim, J., Beachy, P.

OXFORD UNIV PRESS INC.2012: 28–28

- **Identification of a cKit(+) Colonic Crypt Base Secretory Cell That Supports Lgr5(+) Stem Cells in Mice** *GASTROENTEROLOGY*
  Rothenberg, M. E., Nusse, Y., Kalisky, T., Lee, J. J., Dalerba, P., Scheeren, F., Lobo, N., Kulkarni, S., Sim, S., Qian, D., Beachy, P. A., Pasricha, P. J., Quake, et al
  2012; 142 (5): 1195-?

- **COMPARISON OF DIPG NEUROSPHERE CELL LINES FROM THREE PATIENTS** *16th Annual Scientific Meeting of the Society-for-Neuro-Oncology (SNO)/AANS/CNS Section on Tumors*
  Monje, M., Mitra, S. S., Freret, M. E., Edwards, M. S., Weissman, I. L., Beachy, P. A.
  OXFORD UNIV PRESS INC.2011: 165–165

- **Hedgehogs, Flies, Wnts and MYCs: The Time Has Come for Many Things in Medulloblastoma** *JOURNAL OF CLINICAL ONCOLOGY*
  Monje, M., Beachy, P. A., Fisher, P. G.
  2011; 29 (11): 1395-1398

- **Patterning Axon Targeting of Olfactory Receptor Neurons by Coupled Hedgehog Signaling at Two Distinct Steps** *CELL*
  Chou, Y., Zheng, X., Beachy, P. A., Luo, L.
  2010; 142 (6): 954-966

- **Truncating loss-of-function mutations of DISP1 contribute to holoprosencephaly-like microform features in humans** *HUMAN GENETICS*
  Roessler, E., Ma, Y., Ouspenskaia, M. V., Lacbawan, F., Bendavid, C., Dubourg, C., Beachy, P. A., Muenke, M.
  2009; 125 (4): 393-400

- **Hedgehog signalling is essential for maintenance of cancer stem cells in myeloid leukaemia** *NATURE*
  Zhao, C., Chen, A., Jamieson, C. H., Fereshteh, M., Abrahamsson, A., Blum, J., Kwon, H. Y., Kim, J., Chute, J. P., Rizzieri, D., Munchhof, M., VanArsdale, T., Beachy, et al
  2009; 458 (7239): 776-U117

- **Targeted inhibition of hedgehog signaling by cyclopamine prodrugs for advanced prostate cancer** *BIOORGANIC & MEDICINAL CHEMISTRY*
  Kumar, S. K., Roy, I., Anchoori, R. K., Fazli, S., Maitra, A., Beachy, P. A., Khan, S. R.
  2008; 16 (6): 2764-2768

- **Disruption of the basal body comprises proteasomal function and perturbs intracellular Wnt response** *NATURE GENETICS*
  Gerdes, J. M., Liu, Y., Zaghloul, N. A., Leitch, C. C., Lawson, S. S., Kato, M., Beachy, P. A., Beales, P. L., DeMartino, G. N., Fisher, S., Badano, J. L., Katsanis, N.
  2007; 39 (11): 1350-1360

- **Misexpression of Sox9 in mouse limb bud mesenchyme induces polydactyly and rescues hypodactyly mice** *MATRIX BIOLOGY*
  Akiyama, H., Stadler, H. S., Martin, J. F., Ishii, T. M., Beachy, P. A., Nakamura, T., de Crombrugghe, B.
  2007; 26 (4): 224-233

- **Hedgehog signaling maintains a tumor stem cell compartment in multiple myeloma** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Peacock, C. D., Wang, Q., Gesell, G. S., Corcoran-Schwartz, I. M., Jones, E., Kim, J., Devereux, W. L., Rhodes, J. T., Huff, C. A., Beachy, P. A., Watkins, D. N., Matsui, W.
  2007; 104 (10): 4048-4053

- **Hedgehog signaling maintains a tumor stem cell compartment in multiple myeloma.** *Proc. Natl. Acad. Sci. U.S.A.*
  Peacock, C.D., Wang, Q., Gesell, G.S., Corcoran-Schwartz, I.M., Jones, E., Kim, J., Devereux, W.L., Rhodes, J.T., Huff, C.A., Beachy, P.A., Watkins, D.N., Matsui, W.
  2007; 104: 4048-4053

- **Minimizing the risk of reporting false positives in large-scale RNAi screens** *NATURE METHODS*
  Echeverri, C. J., Beachy, P. A., Baum, B., Boutros, M., Buchholz, F., Chanda, S. K., Downward, J., Ellenberg, J., Fraser, A. G., Hacohen, N., Hahn, W. C., Jackson, A. L., Kiger, et al
  2006; 3 (10): 777-779

- **Transcriptional activation by extradenticle in the Drosophila visceral mesoderm** *DEVELOPMENTAL BIOLOGY*
  Stultz, B. G., Jackson, D. G., Mortin, M. A., Yang, X., Beachy, P. A., Hursh, D. A.

2006; 290 (2): 482-494

- **Defective cerebellar response to mitogenic Hedgehog signaling in Down syndrome mice.** *Proc. Natl. Acad. Sci. U.S.A.*
  Roper, R.J., Baxter, L.L., Saran, N.G., Klinedinst, D.K., Beachy, P.A., Reeves, R.H.
  2006; 103: 1452-1456
- **The ihog cell-surface proteins bind Hedgehog and mediate pathway activation** *Cell*
  Yao, S., Lum, L., Beachy, P.A.
  2006; 125: 343-357
- **Structure of a heparin-dependent complex of Hedgehog and Ihog.** *Proc. Natl. Acad. Sci. U.S.A.*
  McLellan, J.S., Yao, S., Zheng, X., Geisbrecht, B.V., Ghirlando, R., Beachy, P.A., Leahy, D.J.
  2006; 103: 17208-17213
- **Activity-dependent internalization of smoothened mediated by beta-arrestin 2 and GRK2** *SCIENCE*
  Chen, W., Ren, X. R., Nelson, C. D., Barak, L. S., Chen, J. K., Beachy, P. A., de Sauvage, F., Lefkowitz, R. J.
  2004; 306 (5705): 2257-2260
- **The SmoA1 mouse model reveals that notch signaling is critical for the growth and survival of sonic hedgehog-induced medulloblastomas** *CANCER RESEARCH*
  Hallahan, A. R., Pritchard, J. I., Hansen, S., Benson, M., Stoeck, J., Hatton, B. A., Russell, T. L., Ellenbogen, R. G., Bernstein, I. D., Beachy, P. A., Olson, J. M.
  2004; 64 (21): 7794-7800
- **Roles for Hedgehog signaling in androgen production and prostate ductal morphogenesis** *DEVELOPMENTAL BIOLOGY*
  Berman, D. M., Desai, N., Wang, X., Karhadkar, S. S., Reynon, M., Abate-Shen, C., Beachy, P. A., Shen, M. M.
  2004; 267 (2): 387-398
- **Identification of Hedgehog pathway components by RNAi in Drosophila cultured cells** *SCIENCE*
  Lum, L., Yao, S. Q., Mozer, B., Rovescalli, A., Von Kessler, D., Nirenberg, M., Beachy, P. A.
  2003; 299 (5615): 2039-2045
- **Differential requirements for Shh in mammary tissue and hair follicle morphogenesis** *DEVELOPMENTAL BIOLOGY*
  Gallego, M. I., Beachy, P. A., Hennighausen, L., Robinson, G. W.
  2002; 249 (1): 131-139
- **Manifestation of the limb prepattern: Limb development in the absence of sonic hedgehog function** *DEVELOPMENTAL BIOLOGY*
  Chiang, C., Litingtung, Y., Harris, M. P., Simandl, B. K., Li, Y., Beachy, P. A., Fallon, J. F.
  2001; 236 (2): 421-435
- **Expression and regulation of chicken fibroblast growth factor homologous factor (FHF)-4 during craniofacial morphogenesis** *DEVELOPMENTAL DYNAMICS*
  Munoz-Sanjuan, I., Cooper, M. K., Beachy, P. A., Fallon, J. F., Nathans, J.
  2001; 220 (3): 238-245
- **Genetics of ventral forebrain development and holoprosencephaly** *CURRENT OPINION IN GENETICS & DEVELOPMENT*
  Muenke, M., Beachy, P. A.
  2000; 10 (3): 262-269
- **Essential role for Sonic hedgehog during hair follicle morphogenesis** *DEVELOPMENTAL BIOLOGY*
  Chiang, C., Swan, R. Z., Grachtchouk, M., Bolinger, M., Ying, L. T., Robertson, E. K., Cooper, M. K., Gaffield, W., Westphal, H., Beachy, P. A., Dlugosz, A. A.
  1999; 205 (1): 1-9
- **Patterning of the embryonic forebrain** *CURRENT OPINION IN NEUROBIOLOGY*
  Rubenstein, J. L., Beachy, P. A.
  1998; 8 (1): 18-26
- **Mediation of Sonic Hedgehog induced expression of COUP-TFII by a protein phosphatase** *SCIENCE*
  Krishnan, V., Pereira, F. A., Qiu, Y., Chen, C. H., Beachy, P. A., Tsai, S. Y., Tsai, M. J.
  1997; 278 (5345): 1947-1950

- **Crystal structure of a hedgehog autoprocessing domain: Homology between hedgehog and self-splicing proteins** *CELL*
  Hall, T. M., Porter, J. A., Young, K. E., Koonin, E. V., Beachy, P. A., Leahy, D. J.
  1997; 91 (1): 85-97

- **pH-dependent enchancement of DNA binding by the ultrabithorax homeodomain** *BIOCHEMISTRY*
  Li, L. K., VONKESSLER, D., Beachy, P. A., Matthews, K. S.
  1996; 35 (30): 9832-9839

- **Overexpression of a Rrp1 transgene reduces the somatic mutation and recombination frequency induced by oxidative DNA damage in Drosophila melanogaster** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Szakmary, A., Huang, S. M., Chang, D. T., Beachy, P. A., Sander, M.
  1996; 93 (4): 1607-1612

- **A POTENTIAL CATALYTIC SITE REVEALED BY THE 1.7-ANGSTROM CRYSTAL-STRUCTURE OF THE AMINO-TERMINAL SIGNALING DOMAIN OF SONIC HEDGEHOG** *NATURE*
  HALL, T. M., PORTER, J. A., BEACHY, P. A., LEAHY, D. J.
  1995; 378 (6553): 212-216

- **PRODUCTS, GENETIC-LINKAGE AND LIMB PATTERNING ACTIVITY OF A MURINE HEDGEHOG GENE** *DEVELOPMENT*
  CHANG, D. T., LOPEZ, A., VONKESSLER, D. P., CHIANG, C., SIMANDL, B. K., ZHAO, R. B., SELDIN, M. F., FALLON, J. F., BEACHY, P. A.
  1994; 120 (11): 3339-3353

- **STRUCTURE AND EXPRESSION OF A FAMILY OF ULTRABITHORAX MESSENGER-RNAS GENERATED BY ALTERNATIVE SPLICING AND POLYADENYLATION IN DROSOPHILA** *GENES & DEVELOPMENT*
  Kornfeld, K., Saint, R. B., Beachy, P. A., Harte, P. J., PEATTIE, D. A., Hogness, D. S.
  1989; 3 (2): 243-258

- **REGULATION AND PRODUCTS OF THE UBX DOMAIN OF THE BITHORAX COMPLEX** *COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY*
  Hogness, D. S., Lipshitz, H. D., Beachy, P. A., PEATTIE, D. A., Saint, R. B., GOLDSCHMIDTCLERMONT, M., Harte, P. J., Gavis, E. R., Helfand, S. L.
  1985; 50: 181-194