Stanford

Roeland Nusse

Virginia and Daniel K. Ludwig Professor of Cancer Research

Developmental Biology

NIH Biosketch available Online

Bio

ACADEMIC APPOINTMENTS

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

ADMINISTRATIVE APPOINTMENTS

- Chair, Developmental Biology, (2007-2020)

HONORS AND AWARDS

- Canada Gairdner International Award, Gairdner Awards (2020)
- Breakthrough Prize in Life Sciences, . (2017)
- Member, US National Academy of Sciences (2010)
- Member, American Academy of Arts and Sciences (2001)
- Member, Royal Dutch Academy of Sciences (1997)
- Member, European Molecular Biology Organization (1988)

LINKS

- Nusse Lab Home Page: https://web.stanford.edu/group/nusselab/cgi-bin/lab/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our laboratory is interested in the growth, development and integrity of animal tissues. We study multiple different organs, trying to identify common principles, and we extend these investigations to cancer and injury repair. In most organs, different cell types are generated by stem cells - cells that also make copies of themselves and thereby maintain the tissue. An optimal balance between the number of stem and differentiated cells is essential for the proper function of the organs. Locally-acting signals are important to maintain this balance in a spatially-organized manner and these signals are key to understanding the regulation of growth.

A common theme linking our work together are Wnt signals. Work from many laboratories, including our own, has shown that Wnt proteins are essential for the control over stem cells. How this is achieved is far from clear and is the subject of studies in the lab, both in vivo and in cell culture. In vivo, a particular question we address is

how physiological changes, such as those occurring during hormonal stimuli, injury or programmed tissue degeneration have an impact on the self-renewal signals and on stem cell biology.

In our most recent work, we have designed cell fate tracking experiments to study stem cells in vivo. We identified Wnt-responsive stem cells by their expression of Axin2 (a common Wnt target gene) and generated a mouse strain with the CreERT2 recombination signal inserted into the Axin2 locus, Axin2-Cre. By clonal labeling, we showed that single stem cells differentiate into different cell types of the tissues of interest. Unexpectedly, in the liver, we found that hepatocytes that reside in the pericentral domain of the liver demonstrate stem cell behavior. Although these cells are functional hepatocytes, they are diploid and thus differ from the mostly polyploid mature hepatocyte population. They are active in homeostatic cell replacement. Adjacent central vein endothelial cells provide the essential source of Wnt signals for the hepatocyte stem cells and thereby constitute the liver stem cell niche.

Teaching

COURSES

2023-24

- From Cells to Organisms: HUMBIO 3A (Win)
- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

2022-23

- Cell and Developmental Biology: HUMBIO 3A (Win)
- Stem Cell Biology & Regenerative Medicine: STEMREM 201A (Aut)

2021-22

- Cell and Developmental Biology: HUMBIO 3A (Win)
- Stem Cell Intensive: STEMREM 200 (Aut)
- Stem Cells and Human Development: From Embryo to Cell Lineage Determination: STEMREM 201A (Aut)

2020-21

- Cell and Developmental Biology: HUMBIO 3A (Win)
- Cells and Signaling in Regenerative Medicine: DBIO 201 (Win)
- Stem Cell Intensive: STEMREM 200 (Aut)
- Stem Cells and Human Development: From Embryo to Cell Lineage Determination: STEMREM 201A (Aut)

STANFORD ADVISEES

Med Scholar Project Advisor

Teni Anbarchian

Doctoral Dissertation Reader (AC)

Devon Harris, Mollie Qian, Miriam Sun

Postdoctoral Faculty Sponsor

Megan Agajanian, Zhibo Zhang

Doctoral Dissertation Co-Advisor (AC)

Courtney Stockman

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

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

Publications

PUBLICATIONS

- **Inflammatory Cytokine TNF alpha Promotes the Long-Term Expansion of Primary Hepatocytes in 3D Culture** *CELL*
  Peng, W., Logan, C. Y., Fish, M., Anbarchian, T., Aguisanda, F., Alvarez-Varela, A., Wu, P., Jin, Y., Zhu, J., Li, B., Grompe, M., Wang, B., Nusse, et al
  2018; 175 (6): 1607-+
- **Generating Cellular Diversity and Spatial Form: Wnt Signaling and the Evolution of Multicellular Animals.** *Developmental cell*
  Loh, K. M., van Amerongen, R., Nusse, R.
  2016; 38 (6): 643-655
- **Self-renewing diploid Axin2(+) cells fuel homeostatic renewal of the liver** *NATURE*
  Wang, B., Zhao, L., Fish, M., Logan, C. Y., Nusse, R.
  2015; 524 (7564): 180-?
- **An integral program for tissue renewal and regeneration: Wnt signaling and stem cell control** *SCIENCE*
  Clevers, H., Loh, K. M., Nusse, R.
  2014; 346 (6205): 54-?
- **Interfollicular Epidermal Stem Cells Self-Renew via Autocrine Wnt Signaling** *SCIENCE*
  Lim, X., Tan, S. H., Koh, W. L., Chau, R. M., Yan, K. S., Kuo, C. J., van Amerongen, R., Klein, A. M., Nusse, R.
  2013; 342 (6163): 1226-1230
- **A Localized Wnt Signal Orients Asymmetric Stem Cell Division in Vitro** *SCIENCE*
  Habib, S. J., Chen, B., Tsai, F., Anastassiadis, K., Meyer, T., Betzig, E., Nusse, R.
  2013; 339 (6126): 1445-1448
- **Wnt Proteins Are Self-Renewal Factors for Mammary Stem Cells and Promote Their Long-Term Expansion in Culture** *CELL STEM CELL*
  Zeng, Y. A., Nusse, R.
  2010; 6 (6): 568-577
- **Purified Wnt5a protein activates or inhibits beta-catenin-TCF signaling depending on receptor context** *PLOS BIOLOGY*
  Mikels, A. J., Nusse, R.
  2006; 4 (4): 570-582
- **Wnt proteins are lipid-modified and can act as stem cell growth factors** *NATURE*
  Willert, K., BROWN, J. D., Danenberg, E., Duncan, A. W., Weissman, I. L., Reya, T., Yates, J. R., Nusse, R.
  2003; 423 (6938): 448-452
- **APEX2-Mediated Proximity Labeling of Wnt Receptor Interactors Upon Pathway Activation.** *microPublication biology*
  Rim, E. Y., Nusse, R.
  2023; 2023
- **PATIENT-DERIVED HEPATOBLASTOMA TUMOROIDS DEPEND ON BOTH RTK SIGNALING AND WNT ACTIVATION**
  Wu, P., Bucher, S., Burhan, D., Nijagal, A., Rangaswami, A., Wang, B., Nusse, R.
  WILEY.2021: S69
- **WNT signaling in pre-granulosa cells is required for ovarian folliculogenesis and female fertility.** *Development (Cambridge, England)*
  Habara, O., Logan, C. Y., Kanai-Azuma, M., Nusse, R., Takase, H. M.
  2021; 148 (9)
- **Running Against the Wnt: How Wnt/beta-Catenin Suppresses Adipogenesis.** *Frontiers in cell and developmental biology*

de Winter, T. J., Nusse, R.
2021; 9: 627429

- **Beta-catenin-mediated Wnt signal transduction proceeds through an endocytosis-independent mechanism.** *Molecular biology of the cell*
  Rim, E. Y., Kinney, L. K., Nusse, R.
  2020: mbcE20020114

- **Next-Generation Surrogate Wnts Support Organoid Growth and Deconvolute Frizzled Pleiotropy In Vivo.** *Cell stem cell*
  Miao, Y. n., Ha, A. n., de Lau, W. n., Yuki, K. n., Santos, A. J., You, C. n., Geurts, M. H., Puschhof, J. n., Pleguezuelos-Manzano, C. n., Peng, W. C., Senlice, R. n., Piani, C. n., Buikema, et al
  2020

- **A ZNRF3-dependent Wnt/beta-catenin signaling gradient is required for adrenal homeostasis** *GENES & DEVELOPMENT*
  Basham, K. J., Rodriguez, S., Turcu, A. F., Lerario, A. M., Logan, C. Y., Rysztak, M. R., Gomez-Sanchez, C. E., Breault, D. T., Koo, B., Clevers, H., Nusse, R., Val, P., Hammer, et al
  2019; 33 (3-4): 209-220

- **A ZNRF3-dependent Wnt/beta-catenin signaling gradient is required for adrenal homeostasis.** *Genes & development*
  Basham, K. J., Rodriguez, S., Turcu, A. F., Lerario, A. M., Logan, C. Y., Rysztak, M. R., Gomez-Sanchez, C. E., Breault, D. T., Koo, B., Clevers, H., Nusse, R., Val, P., Hammer, et al
  2019

- **Wnt/beta-catenin signaling regulates ependymal cell development and adult homeostasis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Xing, L., Anbarchian, T., Tsai, J. M., Plant, G. W., Nusse, R.
  2018; 115 (26): E5954–E5962

- **Wnt/#-catenin signaling regulates ependymal cell development and adult homeostasis.** *Proceedings of the National Academy of Sciences of the United States of America*
  Xing, L. n., Anbarchian, T. n., Tsai, J. M., Plant, G. W., Nusse, R. n.
  2018

- **Stromal R-spondin orchestrates gastric epithelial stem cells and gland homeostasis.** *Nature*
  Sigal, M. n., Logan, C. Y., Kapalczynska, M. n., Mollenkopf, H. J., Berger, H. n., Wiedenmann, B. n., Nusse, R. n., Amieva, M. R., Meyer, T. F.
  2017; 548 (7668): 451–55

- **Axin2 marks quiescent hair follicle bulge stem cells that are maintained by autocrine Wnt/beta-catenin signaling** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Lim, X., Tan, S. H., Yu, K. L., Lim, S. B., Nusse, R.
  2016; 113 (11): E1498-E1505

- **Paracrine Wnt/#-catenin signaling mediates proliferation of undifferentiated spermatogonia in the adult mouse testis.** *Proceedings of the National Academy of Sciences of the United States of America*
  Takase, H. M., Nusse, R.
  2016; 113 (11): E1489-97

- **Axin2 marks quiescent hair follicle bulge stem cells that are maintained by autocrine Wnt/#-catenin signaling.** *Proceedings of the National Academy of Sciences of the United States of America*
  Lim, X., Tan, S. H., Yu, K. L., Lim, S. B., Nusse, R.
  2016; 113 (11): E1498-505

- **Paracrine Wnt/beta-catenin signaling mediates proliferation of undifferentiated spermatogonia in the adult mouse testis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Takase, H. M., Nusse, R.
  2016; 113 (11): E1489-E1497

- **Fibrosis of the Neonatal Mouse Heart After Cryoinjury Is Accompanied by Wnt Signaling Activation and Epicardial-to-Mesenchymal Transition.** *Journal of the American Heart Association*
  Mizutani, M., Wu, J. C., Nusse, R.
  2016; 5 (3)

- **Wnt/beta-Catenin-Responsive Cells in Prostatic Development and Regeneration** *STEM CELLS*
  Lee, S. H., Johnson, D. T., Luong, R., Yu, E. J., Cunha, G. R., Nusse, R., Sun, Z.
  2015; 33 (11): 3356-3367

- **A distinct regulatory region of the Bmp5 locus activates gene expression following adult bone fracture or soft tissue injury.** *Bone*
  Guenther, C. A., Wang, Z., Li, E., Tran, M. C., Logan, C. Y., Nusse, R., Pantalena-Filho, L., Yang, G. P., Kingsley, D. M.
  2015; 77: 31-41

- **A distinct regulatory region of the Bmp5 locus activates gene expression following adult bone fracture or soft tissue injury** *BONE*
  Guenther, C. A., Wang, Z., Li, E., Tran, M. C., Logan, C. Y., Nusse, R., Pantalena-Filho, L., Yang, G. P., Kingsley, D. M.
  2015; 77: 31-41

- **Helicobacter pylori Activates and Expands Lgr5(+) Stem Cells Through Direct Colonization of the Gastric Glands.** *Gastroenterology*
  Sigal, M., Rothenberg, M. E., Logan, C. Y., Lee, J. Y., Honaker, R. W., Cooper, R. L., Passarelli, B., Camorlinga, M., Bouley, D. M., Alvarez, G., Nusse, R., Torres, J., Amieva, et al
  2015; 148 (7): 1392-404 e21

- **Helicobacter pylori Activates and Expands Lgr5(+) Stem Cells Through Direct Colonization of the Gastric Glands** *GASTROENTEROLOGY*
  Sigal, M., Rothenberg, M. E., Logan, C. Y., Lee, J. Y., Honaker, R. W., Cooper, R. L., Passarelli, B., Camorlinga, M., Bouley, D. M., Alvarez, G., Nusse, R., Torres, J., Amieva, et al
  2015; 148 (7): 1392-?

- **Wnts produced by Osterix-expressing osteolineage cells regulate their proliferation and differentiation.** *Proceedings of the National Academy of Sciences of the United States of America*
  Tan, S. H., Senarath-Yapa, K., Chung, M. T., Longaker, M. T., Wu, J. Y., Nusse, R.
  2014; 111 (49): E5262-71

- **Wnts produced by Osterix-expressing osteolineage cells regulate their proliferation and differentiation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Tan, S. H., Senarath-Yapa, K., Chung, M. T., Longaker, M. T., Wu, J. Y., Nusse, R.
  2014; 111 (49): E5262-E5271

- **In Vivo clonal analysis reveals lineage-restricted progenitor characteristics in Mammalian kidney development, maintenance, and regeneration.** *Cell reports*
  Rinkevich, Y., Montoro, D. T., Contreras-Trujillo, H., Harari-Steinberg, O., Newman, A. M., Tsai, J. M., Lim, X., Van-Amerongen, R., Bowman, A., Januszyk, M., Pleniceanu, O., Nusse, R., Longaker, et al
  2014; 7 (4): 1270-1283

- **The Role of Ryk and Ror Receptor Tyrosine Kinases in Wnt Signal Transduction** *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*
  Green, J., Nusse, R., van Amerongen, R.
  2014; 6 (2)

- **Reconstituting pancreas development from purified progenitor cells reveals genes essential for islet differentiation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Sugiyama, T., Benitez, C. M., Ghodasara, A., Liu, L., McLean, G. W., Lee, J., Blauwkamp, T. A., Nusse, R., Wright, C. V., Gu, G., Kim, S. K.
  2013; 110 (31): 12691-12696

- **Structural Studies of Wnts and Identification of an LRP6 Binding Site** *STRUCTURE*
  Chu, M. L., Ahn, V. E., Choi, H., Daniels, D. L., Nusse, R., Weis, W. I.
  2013; 21 (7): 1235-1242

- **Lineage tracing with Axin2 reveals distinct developmental and adult populations of Wnt/ß-catenin-responsive neural stem cells.** *Proceedings of the National Academy of Sciences of the United States of America*
  Bowman, A. N., van Amerongen, R., Palmer, T. D., Nusse, R.
  2013; 110 (18): 7324-7329

- **Paracrine Wnt signaling both promotes and inhibits human breast tumor growth** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Green, J. L., La, J., Yum, K. W., Desai, P., Rodewald, L., Zhang, X., LeBlanc, M., Nusse, R., Lewis, M. T., Wahl, G. M.
  2013; 110 (17): 6991-6996

- **Tympanic border cells are Wnt-responsive and can act as progenitors for postnatal mouse cochlear cells** *DEVELOPMENT*
  Jan, T. A., Chai, R., Sayyid, Z. N., van Amerongen, R., Xia, A., Wang, T., Sinkkonen, S. T., Zeng, Y. A., Levin, J. R., Heller, S., Nusse, R., Cheng, A. G.
  2013; 140 (6): 1196-1206

- **Prospective isolation of human embryonic stem cell-derived cardiovascular progenitors that integrate into human fetal heart tissue** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Ardehali, R., Ali, S. R., Inlay, M. A., Abilez, O. J., Chen, M. Q., Blauwkamp, T. A., Yazawa, M., Gong, Y., Nusse, R., Drukker, M., Weissman, I. L.
  2013; 110 (9): 3405-3410

- **Wnt Signaling in Skin Development, Homeostasis, and Disease** *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*
  Lim, X., Nusse, R.
  2013; 5 (2)

- **Developmental Stage and Time Dictate the Fate of Wnt/beta-Catenin-Responsive Stem Cells in the Mammary Gland** *CELL STEM CELL*
  van Amerongen, R., Bowman, A. N., Nusse, R.
  2012; 11 (3): 387-400

- **Wnt5a can both activate and repress Wnt/beta-catenin signaling during mouse embryonic development** *DEVELOPMENTAL BIOLOGY*
  van Amerongen, R., Fuerer, C., Mizutani, M., Nusse, R.
  2012; 369 (1): 101-114

- **Wnt Proteins** *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*
  Willert, K., Nusse, R.
  2012; 4 (9)

- **Endogenous Wnt signalling in human embryonic stem cells generates an equilibrium of distinct lineage-specified progenitors** *NATURE COMMUNICATIONS*
  Blauwkamp, T. A., Nigam, S., Ardehali, R., Weissman, I. L., Nusse, R.
  2012; 3

- **Three decades of Wnts: a personal perspective on how a scientific field developed** *EMBO JOURNAL*
  Nusse, R., Varmus, H.
  2012; 31 (12): 2670-2684

- **ROR2 is a novel prognostic biomarker and a potential therapeutic target in leiomyosarcoma and gastrointestinal stromal tumour** *JOURNAL OF PATHOLOGY*
  Edris, B., Espinosa, I., Muehlenberg, T., Mikels, A., Lee, C., Steigen, S. E., Zhu, S., Montgomery, K. D., Lazar, A. J., Lev, D., Fletcher, J. A., Beck, A. H., West, et al
  2012; 227 (2): 223-233

- **Wnt signaling induces proliferation of sensory precursors in the postnatal mouse cochlea** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Chai, R., Kuo, B., Wang, T., Liaw, E. J., Xia, A., Jan, T. A., Liu, Z., Taketo, M. M., Oghalai, J. S., Nusse, R., Zuo, J., Cheng, A. G.
  2012; 109 (21): 8167-8172

- **Wnt Signaling** *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*
  Nusse, R.
  2012; 4 (5)

- **The Receptor Tyrosine Kinase ROR2 Is a Novel Marker for TSC-Associated Lesions and a Potential Therapeutic Target Independent of the TSC/mTOR Pathway** *101st Annual Meeting of United-States-and-Canadian-Academy-of-Pathology (USCAP)*
  SWEENEY, R. T., Badreddin, E., Montgomery, K. D., Nusse, R., van de Rijn, M.
  NATURE PUBLISHING GROUP.2012: 491A–491A

- **Secreted Wingless-interacting molecule (Swim) promotes long-range signaling by maintaining Wingless solubility** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Mulligan, K. A., Fuerer, C., Ching, W., Fish, M., Willert, K., Nusse, R.
  2012; 109 (2): 370-377

- **Identification of Cardiovascular Progenitors From Human Embryonic Stem Cells** *Scientific Sessions of the American-Heart-Association/Resuscitation Science Symposium*

Ardehali, R., Ali, S., Drukker, M., Abilez, O., Blauwkamp, T., Nusse, R., Weissman, I.
LIPPINCOTT WILLIAMS & WILKINS.2011

- **A Suppressor/Enhancer Screen in Drosophila Reveals a Role for Wnt-Mediated Lipid Metabolism in Primordial Germ Cell Migration** *PLOS ONE*
  McElwain, M. A., Ko, D. C., Gordon, M. D., Fyrst, H., Saba, J. D., Nusse, R.
  2011; 6 (11)
- **Location, Location, Location: FoxM1 Mediates beta-Catenin Nuclear Translocation and Promotes Glioma Tumorigenesis** *CANCER CELL*
  Bowman, A., Nusse, R.
  2011; 20 (4): 415-416
- **Embryonic stem cells require Wnt proteins to prevent differentiation to epiblast stem cells** *NATURE CELL BIOLOGY*
  Ten Berge, D., Kurek, D., Blauwkamp, T., Koole, W., Maas, A., Eroglu, E., Siu, R. K., Nusse, R.
  2011; 13 (9): 1070-U88
- **A crucial role for lipid phosphorylation in WntD-mediated primordial germ cell migration**
  McElwain, M. A., Ko, D. C., Gordon, M. D., Nusse, R.
  ACADEMIC PRESS INC ELSEVIER SCIENCE.2011: 192
- **Wnt Proteins Promote Bone Regeneration** *SCIENCE TRANSLATIONAL MEDICINE*
  Minear, S., Leucht, P., Jiang, J., Liu, B., Zeng, A., Fuerer, C., Nusse, R., Helms, J. A.
  2010; 2 (29)
- **Lentiviral Vectors to Probe and Manipulate the Wnt Signaling Pathway** *PLOS ONE*
  Fuerer, C., Nusse, R.
  2010; 5 (2)
- **A Study on the Interactions Between Heparan Sulfate Proteoglycans and Wnt Proteins** *DEVELOPMENTAL DYNAMICS*
  Fuerer, C., Habib, S. J., Nusse, R.
  2010; 239 (1): 184-190
- **Ror2 Receptor Requires Tyrosine Kinase Activity to Mediate Wnt5A Signaling** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Mikels, A., Minami, Y., Nusse, R.
  2009; 284 (44): 30167-30176
- **Towards an integrated view of Wnt signaling in development** *DEVELOPMENT*
  van Amerongen, R., Nusse, R.
  2009; 136 (19): 3205-3214
- **Ror2, a developmentally regulated kinase, promotes tumor growth potential in renal cell carcinoma** *ONCOGENE*
  Wright, T. M., Brannon, A. R., Gordan, J. D., Mikels, A. J., Mitchell, C., Chen, S., Espinosa, I., van de Rijn, M., Pruthi, R., Wallen, E., Edwards, L., Nusse, R., Rathmell, et al
  2009; 28 (27): 2513-2523
- **Telomerase modulates Wnt signalling by association with target gene chromatin** *NATURE*
  Park, J., Venteicher, A. S., Hong, J. Y., Choi, J., Jun, S., Shkreli, M., Chang, W., Meng, Z., Cheung, P., Ji, H., McLaughlin, M., Veenstra, T. D., Nusse, et al
  2009; 460 (7251): 66-U77
- **Wnt Signaling Mediates Self-Organization and Axis Formation in Embryoid Bodies** *CELL STEM CELL*
  ten Berge, D., Koole, W., Fuerer, C., Fish, M., Eroglu, E., Nusse, R.
  2008; 3 (5): 508-518
- **Wnt-mediated self-renewal of neural stem/progenitor cells** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kalani, M. Y., Cheshier, S. H., Cord, B. J., Bababeygy, S. R., Vogel, H., Weissman, I. L., Palmer, T. D., Nusse, R.
  2008; 105 (44): 16970-16975
- **Wnt and FGF signals interact to coordinate growth with cell fate specification during limb development** *DEVELOPMENT*
  ten Berge, D., Brugmann, S. A., Helms, J. A., Nusse, R.
  2008; 135 (19): 3247-3257

- **Translating insights from development into regenerative medicine: The function of Wnts in bone biology** *SEMINARS IN CELL & DEVELOPMENTAL BIOLOGY*
  Leucht, P., Minear, S., Ten Berge, D., Nusse, R., Helms, J. A.
  2008; 19 (5): 434-443

- **Alternative Wnt Signaling Is Initiated by Distinct Receptors** *SCIENCE SIGNALING*
  van Amerongen, R., Mikels, A., Nusse, R.
  2008; 1 (35)

- **Liposomal Packaging Generates Wnt Protein with In Vivo Biological Activity** *PLOS ONE*
  Morrell, N. T., Leucht, P., Zhao, L., Kim, J., Ten Berge, D., Ponnusamy, K., Carre, A. L., Dudek, H., Zachlederova, M., McElhaney, M., Brunton, S., Gunzner, J., Callow, et al
  2008; 3 (8)

- **Pathogenesis of Listeria-infected Drosophila wntD mutants is associated with elevated levels of the novel immunity gene edin** *PLOS PATHOGENS*
  Gordon, M. D., Ayres, J. S., Schneider, D. S., Nusse, R.
  2008; 4 (7)

- **Lipid-independent secretion of a Drosophila Wnt protein** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Ching, W., Hang, H. C., Nusse, R.
  2008; 283 (25): 17092-17098

- **Asymmetric homotypic interactions of the atypical cadherin Flamingo mediate intercellular polarity signaling** *CELL*
  Chen, W., Antic, D., Matis, M., Logan, C. Y., Povelones, M., Anderson, G. A., Nusse, R., Axelrod, J. D.
  2008; 133 (6): 1093-1105

- **A dermal HOX transcriptional program regulates site-specific epidermal fate** *GENES & DEVELOPMENT*
  Rinn, J. L., Wang, J. K., Allen, N., Brugmann, S. A., Mikels, A. J., Liu, H., Ridky, T. W., Stadler, H. S., Nusse, R., Helms, J. A., Chang, H. Y.
  2008; 22 (3): 303-307

- **Wnt Signaling and Stem Cell Control** *73rd Cold Spring Harbor Symposium on Quantitative Biology*
  Nusse, R., Fuerer, C., Ching, W., Harnish, K., Logan, C., Zeng, A., Ten Berge, D., Kalani, Y.
  COLD SPRING HARBOR LABORATORY PRESS.2008: 59–66

- **Wnt/beta-catenin signaling in murine hepatic transit amplifying progenitor cells** *GASTROENTEROLOGY*
  Hu, M., Kurobe, M., Jeong, Y. J., Fuerer, C., Ghole, S., Nusse, R., Sylvester, K. G.
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- **Transcriptional Program Induced by Wnt Protein in Human Fibroblasts Suggests Mechanisms for Cell Cooperativity in Defining Tissue Microenvironments** *PLOS ONE*
  Klapholz-Brown, Z., Walmsley, G. G., Nusse, Y. M., Nusse, R., Brown, P. O.
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- **Wnt signaling mediates regional specification in the vertebrate face** *DEVELOPMENT*
  Brugmann, S. A., Goodnough, L. H., Gregorieff, A., Leucht, P., Ten Berge, D., Fuerer, C., Clevers, H., Nusse, R., Helms, J. A.
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- **Mutants in the Mouse NuRD/Mi2 Component P66 alpha Are Embryonic Lethal** *PLOS ONE*
  Marino, S., Nusse, R.
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- **Converging on beta-catenin in Wilms tumor** *SCIENCE*
  Nusse, R.
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