

Society for Developmental Biology 67th Annual Meeting
University of Pennsylvania
Philadelphia, Pennsylvania
July 25 – July 30, 2008

PROGRAM

Italic numbers = Abstract program number

Organizing Committee: Eric Wieschaus (Chair, SDB President), Phil Benfey, Robb Krumlauf, Arthur Lander, Susan Mango, Scott Poethig

Local Organizers: Dan Kessler, Ida Chow

Friday, July 25

1 – 9 pm **Second SDB Boot Camp for New Faculty** *Biomedical Res Bldg II/III*
Chair: Karen Bennett (SDB Professional Development & Education Committee Co-chair), Univ of Missouri-Columbia

Saturday, July 26

8 am – 1 pm **Second SDB Boot Camp for New Faculty** *Biomedical Res Bldg II/III*
continuation

9 am – 5 pm **Satellite Symposium** (non-SDB session) *Logan Hall G17*
Transcriptional Control of Neural Development
Chair: Marthe Howard, Univ Toledo College of Medicine

1 pm – 7 pm Meeting Registration *Houston Hall*
Posters and Exhibits set up

7 pm – 9 pm **Presidential Symposium** *Irvine Auditorium*
Developmental Biology in the 21st Century
Chair: Eric Wieschaus (President), Princeton
Session sponsored by the Dept of Cell and Developmental Biology, U Pennsylvania

7:00 *Imaging the cell lineages, motions, and signals that pattern the embryo.* **S. Fraser**, Caltech, Pasadena, CA, USA

7:40 *1 Genome Meets Epigenome: Sequencing and Analysis of the DNA Methylome.* **J.R. Ecker**, R. Lister, R.C. O'Malley, J. Tonti-Filippini, C.C. Berry, A. Millar. Plant Biology Laboratory, and Genomic Analysis Laboratory, The Salk Institute for Biological Studies, La Jolla, CA, USA; ARC Centre of Excellence in Plant Energy Biology, The University of Western Australia, Australia

8:20 *Genes that control the rate of aging.* **C. Kenyon**, UCSF, San Francisco, CA, USA

9 pm – 11 pm **Opening Reception and Poster Session I, with Exhibits**
Houston Hall: Hall of Flags, Hall of Flags Balcony, Bodek Lounge and Class of 1949
Poster Session I themes: Education, Development and Evolution, Morphogenesis, Cell-cell Signaling, Intracellular Signaling Pathways, Cell Fate Specification, Cell Motility and Guidance, Cell Proliferation, Germ Cells and Gametogenesis, Fertilization, Stem Cells and Tissue Regeneration, Molecular Medicine and Development.

Author presentation: Sun, July 27, 8-11 PM

See abstract listing at the end of the Program.

Sunday, July 27

8 am – 6 pm Meeting Registration

Houston Hall

8 am – 9 am

Funding Opportunities in Developmental Biology

Amado Recital

Moderator: Ida Chow, SDB

Participants: Representatives of funding agencies – NSF, NIH

9 am – 12:30 pm

Concurrent Symposia I

Symposium 1: RNA, Localization, Translational and Regulation

Logan Hall G17

Chair: Henry Krause (Canada Representative), Univ of Toronto

9:00 2 *Localized RNAs, localized translation, and developmental asymmetry.* **E. Gavis.** Dept. of Molecular Biology, Princeton University, Princeton, NJ, USA.

9:30 3 *Switching from Repression to Activation: Post-Transcriptional Regulation of BMP2 Synthesis.* **M.B. Rogers,** S. Jiang. Biochem. & Molec. Biol., UMDNJ – NJ Medical School, Newark, NJ, USA.

9:45 4 *Pattern Formation by Small RNA Signals.* **M. Timmermans,** D. Chitwood, F. Nogueira, S. Madi. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA.

10:15 5 *Bucky ball establishes animal-vegetal polarity in the oocyte and in the follicle cell layer in zebrafish.* **F.L. Marlow,** F. Bontems, R. Dosch, M.C. Mullins. Department of Cell & Developmental Biology, University of Pennsylvania, USA; Department of Zoology, University of Geneva, Switzerland.

10:30 Coffee Break

11:00 *P granules and translational control.* **J. Priess,** F Hutchinson Cancer Res Ctr, Seattle, WA

11:30 6 *Large P body-like RNPs form in C. elegans oocytes in response to arrested ovulation, heat shock, osmotic stress, and anoxia and are regulated by the major sperm protein pathway.* **J.A. Schisa,** M.C. Jud, M.J. Czerwinski, M.P. Wood, R.A. Young, C.M. Gallo, J.S. Bickel, E.L. Petty, J.M. Mason, B.A. Little. Central Michigan University Biology Dept., Mt. Pleasant, MI; Johns Hopkins School of Medicine, Baltimore, MD; University of North Texas, Department of Biological Sciences, Denton TX.

11:45 7 *RNA transport in the oocyte cytoplasm: How to get there from here.* **K.L. Mowry,** J.A. Gagnon, J.A. Kreiling, T.J. Messitt, C.A. Pratt, Y.J. Yoon. Dept. of Mol. Biol. Cell Biol. & Biochem, Brown University, Providence RI, USA; Maine Medical Center, Portland, ME, USA; Div. of Biology, California Institute of Technology, Pasadena, CA, USA.

12:15 8 *Global analysis of mRNA localization reveals a prominent role in the organization of cellular architecture and function.* **E. Lecuyer,** H. Yoshida, N. Parthasarathy, C. Alm, T. Babak, P. Tomancak, H. Krause. Donnelly CCBR, University of Toronto, Toronto, ON, Canada; Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany.

Symposium 2: Neuronal Pathfinding and Identity

Logan Hall Terrace

Chair: Cathy Krull (Midwest Representative), Univ of Michigan-Ann Arbor

9:00 9 *The Form and Function of an Olfactory Sensory Map in the Fly Brain.* **L.B. Vosshall.** Lab. of Neurogenetics & Behavior, Rockefeller Univ., New York, NY, USA

9:30 10 *Specification, migration, and differentiation of the left-sided parapineal organ.* **J.T. Gamse,** C.D. Snelson, J.A. Clanton. Department of Biological Sciences, Vanderbilt University, Nashville, TN, USA.

9:45 11 *Hypothyroidism induced deafness: defects in neuronal development and sensory cell function.* **M. Mustapha,** Q. Fang, R.K. Duncan, Y. Raphael, D.F. Dolan, A. Giordimaina, T. Gong, M. Lomax, K.R. Johnson, **S.A. Camper.** Dept. Human Genetics, U. Michigan, Ann Arbor, MI; Dept. Otorhinolaryngology, U. Michigan, Ann Arbor, MI; Jackson Laboratory, Bar Harbor, ME.

10:15 12 *The role of Hox genes in the specification of neural crest.* **S.R. Kadison,** T. Iwashita, S.J. Morrison, C.E. Krull. Biol and Material Sci, Univ of Michigan, Ann Arbor, MI; Stem Cell Biol, HHMI/LSI, Univ of Michigan, Ann Arbor, MI.

10:30 Coffee Break

11:00 13 *Extrinsic mechanisms regulate synapse formation.* **K. Shen,** V.Y. Poon, M.P. Klassen. Department of Biology; Neuroscience Program, Stanford University, Stanford, CA

11:30 14 *Neuromancer-1 and Neuromancer-2 Regulate Cell Fate Specification in the Embryonic CNS of Drosophila melanogaster.* **S.M. Leal,** L. Qian, R. Bodmer, J.B. Skeath. Dept. of Biological Sciences, Univ.

Southern MS, Hattiesburg, MS; Dept. of Genetics, Washington Univ. Medical School, St. Louis, MO; The Gladstone Institute, San Francisco, CA; The Burnham Institute, La Jolla, CA.

11:45 15 *The zebrafish unplugged/MuSK receptor controls pre- and postsynaptic development.* **M. Granato**. Department of Cell & Developmental Biology, UPenn, Philadelphia, USA.

12:15 16 *The floor plate gene, foxa2, is required for the generation and maintenance of midbrain dopamine neurons.* **R. Kittappa**, W.W. Chang, R.B. Awatramani, R.D. McKay. Laboratory of Molecular Biology, NINDS-NIH, Bethesda, MD, USA; Dept of Neurology, Northwestern University, Chicago, IL

Symposium 3: Evolution and Diversity of Pattern

Irvine Auditorium

Chair: Robb Krumlauf (*Developmental Biology* Editor-in-Chief), Stowers Inst for Med Res

9:00 17 *Towards Understanding Evolutionary Diversification in Leaf Form.* **M. Tsiantis**. Dept. of Plant Sciences, Univ. of Oxford, U.K.

9:30 18 *Widespread gene expression divergence between organisms with near-identical embryonic development.* **I. Yanai**, C.P. Hunter. Dept. of Molecular and Cellular Biol., Harvard Univ., Cambridge, MA

9:45 *Gene regulatory networks and cell shapes in *Ciona intestinalis*.* **P. Lemaire**, Université de la Méditerranée, Marseille, France

10:15 19 *Non-equivalent in vivo function for mouse and zebrafish *Hoxa3* Genes using gene targeting in mice.* **N.R. Manley**, L. Chen. Dept. of Genetics, University of Georgia, Athens, GA

10:30 Coffee Break

11:00 20 *Stripes and spots: towards an integrative model for studying the evolution of form.* **D.M. Parichy**. Department of Biology, University of Washington, Seattle WA

11:30 21 **Dmbx1* genes are involved in growth and differentiation in zebrafish retinal and tectal development.* **L. Wong**, C. Kuo, V. Tropepe. Dept of Cell & Systems Biology, University of Toronto, Toronto, ON, Canada.

11:45 22 *Ancient evolutionary origin of the neural crest gene regulatory network.* **M. Bronner-Fraser**. Division of Biology, California Institute of Technology, Pasadena CA

12:15 23 *Transcriptional Regulatory Sequence Divergence Between Mouse and Bat Modifies Forelimb Length.* **C.J. Cretekos**, Y. Wang, E.D. Green, J.F. Martin, J.J. Rasweiler IV, R.R. Behringer. Dept. of Biological Sciences, Idaho State Univ., Pocatello, ID; Dept. of Molecular Genetics, Univ. of Texas M.D. Anderson Cancer Center, Houston, TX; Genome Technology Branch and NIH Intramural Sequencing Center, National Human Genome Research Inst., Bethesda, MD

12:30 pm – 2 pm Lunch with posters and exhibits viewing

Houston Hall

2 pm - 4 pm

Education Symposium: Publishing Science

Irvine Auditorium

Co-Chairs: Gail Martin (SDB Past-President) and Jasna Markovac (SDB Publications

Committee Chair)

24 *Publishing Science.* **G.R. Martin, J. Markovac**. Dept. of Anatomy, UCSF, San Francisco, CA; Publishing & Editorial Services, San Diego, CA.

Participating Speakers: Marianne Bronner-Fraser, Caltech; Beth Fischer, Univ. Pittsburgh; Robb Krumlauf, *Dev Biol*; Daniel Wainstock, *Dev Cell*; Jane Alfred, *Development*; Natalie Dewitt, *Nature*

2 pm – 4 pm

Education Roundtable: Science Education Outreach by Scientists **Logan Hall G17**

Moderator: Yolanda Cruz (SDB Professional Development & Education Cmt), Oberlin

Discussants: Marnie Halpern, Carnegie Institution; Steve Farber, Carnegie Institution; Jamie Shuda, Thomas Jefferson Univ; Diana Darnell, SDB LEADER Curator; Melinda Lowy, Am Physiological Society; Leland Johnson, U Maine Darling Marine Center

4 pm – 4:30 pm

SDB Business Meeting

Irvine Auditorium

Chair: Eric Wieschaus, SDB President

4:30 pm - 6:30 pm

Plenary Session I

Irvine Auditorium

Chair: Dan Kessler (Mid-Atlantic Representative), Univ of Pennsylvania

- 4:30 25 *The Fat Signaling Pathway*. **K. Irvine**, Y. Feng, H. Ishikawa, B. Kucuk, Y. Mao, H. Oh, S. Powell, C. Rauskolb, B. Reddy, D. Rogulja. Howard Hughes Medical Institute, Waksman Institute and Dept of Molec Biol and Biochem, Rutgers The State University of New Jersey, Piscataway NJ
- 5:10 26 *Asymmetry and patterning in plant epidermal development*. **D.C. Bergmann**. Dept. of Biology, Stanford University, Stanford, CA, USA.
- 5:50 27 *Anterior-posterior asymmetry in beta-catenin localization during embryonic cell divisions in the spiral-cleaving polychaete *Platynereis dumerilii**. **B.A. Bowerman**, S.Q. Schneider. Inst. of Mol. Biol, Univ. of Oregon, Eugene, OR, USA.

6:30 pm – 7:30 pm **SDB Directors' Reception for Students and Postdocs** *Amado Recital*

6:30 pm – 8 pm Dinner on your own

8 pm – 11 pm **Poster Session I, Exhibits & Mixer**

Houston Hall: Hall of Flags, Hall of Flags Balcony, Bodek Lounge and Class of 1949

Posters tear down at end of session

Poster Session I themes: Education, Development and Evolution, Morphogenesis, Cell-cell Signaling, Intracellular Signaling Pathways, Cell Fate Specification, Cell Motility and Guidance, Cell Proliferation, Germ Cells and Gametogenesis, Fertilization, Stem Cells and Tissue Regeneration, Molecular Medicine and Development.

Author presentation: **Odd board numbers** – 8-9:30 PM; **Even board numbers** – 9:30-11 PM

See abstract listing at the end of the Program.

Monday, July 28

8 am – 5 pm Meeting Registration *Houston Hall*

8 am – 9 am **Breakfast Tutorial** – Discussion on Morpholinos *Amado Recital*
Jon Moulton and Dan Arbogast, Gene Tools, LLC

8 am – 12:30 pm Posters (Session II) set up *Houston Hall*

9 am – 12:30 pm **Concurrent Symposia II**
Symposium 4: Signaling Pathways and Networks

Logan Hall G17

Chair: Tom Schilling (West Coast Representative), UC Irvine

9:00 28 *Regulation of Nodal Signaling*. **A. Schier**. Harvard University, Cambridge, MA

9:30 29 *Chemokine signaling controls endodermal migration during zebrafish gastrulation*. **S. Nair**, T.F. Schilling. University of California, Irvine.

9:45 30 *The engineering of developmental regulation*. **A.D. Lander**. Dept. of Developmental and Cell Biology, Univ. of California, Irvine; Center for Complex Biological Systems, Univ. of California, Irvine

10:15 31 *PDLIM5 is required in secreting cells for canonical Wnt signaling*. **J.A. White**, C.C. Wylie, J. Heasman. Division of Developmental Biology, Department of Pediatrics, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH

10:30 Coffee Break

11:00 32 *Ephrin-B signaling in mouse development*. J.O. Bush, **P. Soriano**. FHRC, Seattle, WA.

11:30 33 *kerouac is required for proper cilia formation and patterning of multiple tissues*. **S. Weatherbee**, P. Ocbina, H. Alcorn, L. Niswander, K. Anderson. Yale Univ. School of Medicine, New Haven, CT; Memorial Sloan Kettering, New York, NY, USA; Univ. Colorado Health Sci. Ctr., Aurora, CO

11:45 34 *Regulation of *C. elegans* sex determination by proteolysis of the Gli protein TRA-1A*. **A.M. Spence**, M. Schwarzstein, N.G. Starostina, E.T. Kipreos. Dept. of Molecular Genetics, University of Toronto, Toronto, ON, Canada; Dept. of Cellular Biology, University of Georgia, Athens, GA, USA; Dept. of Developmental Biology, Stanford University, Stanford, CA, USA.

12:15 35 *Exploring the basis of functional redundancy between transcription factors.* **N.V. Kirienko**, J.D. McEnerney, D.S. Fay. Department of Molecular Biology, University of Wyoming

Symposium 5: Morphogenesis

Irvine Auditorium

Chair: Joe Yost (Southwest Representative), Univ of Utah

9:00 36 *Combining Modern and Classical Methods to Study Morphogenesis Mechanisms in C. elegans.* **B. Goldstein**, J. Lee, D.J. Marston, G. Shemer, J.M. Sawyer, M. Roh, J.R. Harrell. Biology Dept, University of North Carolina at Chapel Hill, NC

9:30 37 *A quantitative analysis of imaging data provides insights into the coordination of cell movements during Drosophila gastrulation.* **A. Stathopoulos**, A. McMahon, W. Supatto, S. Fraser. Division of Biology, Caltech, Pasadena, CA; Beckman Imaging Facility, Caltech, Pasadena, CA

9:45 38 *The genetic hierarchy that controls gastrulation in Drosophila.* S. Mathew, M. Rembold, **M. Leptin**. Institute of Genetics, Cologne University, Germany

10:15 39 *The calcium channel β subunit is required for morphogenetic movements in gastrulation.* **D.M. Garrity**, A.M. Ebert, W.A. Horne. Dept. of Biology, Colo. State Univ., Ft. Collins, CO; College of Vet. Medicine, Cornell Univ., Ithaca, NY

10:30 Coffee Break

11:00 40 *Gene regulatory networks governing morphogenesis.* **D.R. McClay**, J.C. Croce, S. Wu, W.S. Beane, K.D. Walton. Department of Biology, Duke University, Durham, NC; Department of Biology, Vanderbilt University, Nashville, TN; Department of Developmental Biology, Harvard University, Boston, MA; Center for Organogenesis, University of Michigan, Ann Arbor, MI

11:30 41 *Live imaging reveals that the endoderm of the mouse embryo is generated by intercalation of extraembryonic and epiblast-derived cells.* **G. Kwon**, M. Viotti, K. Hadjantonakis. Developmental Biology Program, Sloan-Kettering Institute, New York, NY; Neuroscience Program; Biochemistry, Cell and Molecular Biology Program, Weill Graduate School of Medical Sciences of Cornell University, New York, NY

11:45 42 *Planar cell polarity and ciliogenesis in vertebrate embryos.* **J. Wallingford**, B. Mitchell, P. Abitua, C. Kintner, J. Wallingford. MCDB & ICMB, University of Texas at Austin; Salk Institute.

12:15 43 *Molecular regulation of collective epithelial migration during mammary branching morphogenesis.* **A.J. Ewald**, A. Brenot, Z. Werb. Dept. of Anatomy, UCSF, San Francisco, CA

Symposium 6: Stem Cells and Differentiation

Logan Hall Terrace

Chair: Blanche Capel (Southeast Representative), Duke

9:00 44 *The role of the piRNA pathway in stem cell self-renewal.* **H. Lin**, H. Yin, E. Beyret, S. Findley, W. Deng. Yale Stem Cell Center, Yale Univ., New Haven, CT, USA; Current Address: Univ. of Missouri, MO, USA; Current Address: Salk Inst., La Jolla, CA

9:30 45 *Regulation of ES Self Renewal and Pluripotency by Foxd3.* **P.A. Labosky**, Y. Liu. Center for Stem Cell Biology, Cell and Dev Biol., Vanderbilt University, Nashville, TN

9:45 *Planarian germ cells.* **P. Newmark**, Univ Illinois-Urbana, IL

10:15 46 *Gata3 regulates stem cell self-renewal and differentiation in the extraembryonic lineage during mouse development.* **A. Ralston**, J. Draper, B. Cox, J. Rossant. Dept. of Developmental & Stem Cell Biology, The Hospital for Sick Children, Toronto, ON, Canada

10:30 Coffee Break

11:00 47 *Stem cell renewal and lineage selection in mammalian epidermis.* **F.M. Watt**. CRUK Cambridge Research Institute, Cambridge, UK

11:30 48 *Fam20b and Xylosyltransferase1 (Xylt1) drive cartilage matrix production and inhibit perichondral bone during endochondral ossification.* **B.F. Eames**, M.E. Swartz, C.B. Kimmel. Inst. of Neuroscience, Univ. of Oregon, Eugene, OR

11:45 49 *Pluripotency and the onset of differentiation in the C. elegans soma.* **S.E. Mango**, T. Yuzyuk, T. Fakhouri. Dept. of Oncological Sciences, Huntsman Cancer Institute, Univ. of Utah, Salt Lake City, UT

12:15 50 *APC inhibits supernumerary tooth formation during embryogenesis and throughout adulthood.* **X. Wang**, D. O'Connell, J.J. Lund, I. Saadi, M. Kuraguchi, A. Turbe-Doan, R. Kucherlapati, R.L. Maas. Dept. of Medicine, Brigham and Women's Hospital, Harvard Medical School, MA

12:30 pm – 2 pm Lunch with posters and exhibits viewing **Houston Hall**

2 pm - 4 pm **Postdoc Symposium** **Irvine Auditorium**
Session sponsored by Genentech
Co-Chairs: Brian Eames, U Oregon; Natalie Denef, Princeton; Stephanie Kadison,
U Michigan-Ann Arbor

Session organized by the co-chairs who also selected the talks from submitted abstracts and best postdoctoral presentations at the SDB 2008 Regional Meetings

2:00 379 *Regulation of canonical Wnt signaling by Brachury is essential for posterior mesoderm formation.* **Benjamin L. Martin**, D. Kimelman. Dept. of Biochemistry, University of Washington, Seattle, WA, USA.

2:15 276 *magellan functions during oogenesis to establish the animal-vegetal axis of the zebrafish egg.* **Tripti Gupta**, F. Marlow, W. Mei, M. Mullins. Univ. of Pennsylvania, Philadelphia, PA, USA.

2:30 234 *Hedgehog signaling regulates mammalian sensory cell formation and auditory function.* **Elizabeth Carroll Driver**, M.W. Kelley. Sect. on Dev. Neuroscience, NIDCD, NIH, Bethesda, MD, USA.

2:45 418 *Beta-cell number is limited by the Cdx4 transcription factor.* **Mary D. Kinkel**, V.E. Prince. Dept. of Organismal Biol. & Anat., Univ. of Chicago, Chicago, IL, USA.

3:00 111 *Development of the carapacial ridge: implications for the evolution of genetic networks in turtle shell development.* **Jacqueline E. Moustakas**. Dept. of Integrative Biology, University of California, Berkeley CA USA; Museum of Paleontology, UC Berkeley, CA, USA.

3:15 85 *A novel Pax gene controls the formation of stem cells in the leech embryo.* **Matthew Schmerer**, R. Savage, M. Shankland. Section of Mol. Cell and Dev. Biol., UT Austin, Austin, TX, USA; Biology Dept., Williams College, Williamstown, MA, USA.

3:30 L33 *Role of ADAM metalloproteases in cranial neural crest cell migration in Xenopus laevis.* **Helene Cousin**, C. McCusker, D. Alfandari. Veterinary and Animal Sciences, University of Massachusetts, Amherst, MA, USA.

3:45 309 *Intestinal renewal and regeneration in the planarian Schmidtea mediterranea.* **David J. Forsthoefel**, D.J. Escobar, J.M. Stary, P.A. Newmark. Department of Cell and Developmental Biology; Neuroscience Program, University of Illinois at Urbana-Champaign, Urbana, IL, USA.

2 pm – 4 pm **Education Hands-on Workshop** **Logan Hall G17**
Introduction to NCBI and Other Online Bioinformatics Resources
Instructor: Li-San Wang, Univ of Pennsylvania

Pre-registration required, limited to 50 people. Registrants are encouraged to bring own laptop.

4:30 pm – 6:30 pm **Plenary Session II: Awards Lectures** **Irvine Auditorium**

4:30 *Life in Transition.* **James P. Collins**, NSF Assistant Director for Biological Sciences. A special presentation on NSF's BIO Directorate Programs

5:00 **Liz Robertson**, Oxford - E.G. Conklin Medal, introduced by Marianne Bronner-Fraser, SDB President-elect

5:30 **Igor Dawid**, NICHD - *Developmental Biology*-SDB Lifetime Achievement Award, introduced by Eric Wieschaus, SDB President

6:00 **Leland Johnson**, Augustana College and Univ of Maine Darling Marine Ctr – V. Hamburger Outstanding Educator Prize, introduced by Bill Wood, SDB Prof Devel & Educ Cmt Chair

51 *Mentoring in Two Centuries.* **L.G. Johnson**. Augustana College (Retired), Sioux Falls, SD; Univ of Maine Darling Marine Center, Walpole, ME.

6:30 pm – 8 pm Dinner on your own

8 pm – 11 pm **Poster Session II, Commercial Exhibits & Mixer**

Houston Hall: Hall of Flags, Hall of Flags Balcony, Bodek Lounge and Class of 1949

Poster Session II themes: Functional Genomics, Gene Regulation, Early Embryo Patterning, Patterning and Transcription Factors, Organogenesis, Late Abstracts

Author presentation: **Odd board numbers** – 8-9:30 PM; **Even board numbers** – 9:30-11 PM
See abstract listing at the end of the Program.

Tuesday, July 29

8 am – 5 pm Meeting Registration

Houston Hall

9 am – 12:30 pm **Concurrent Symposia III**

Symposium 7: Organ Systems in Vertebrate Development

Irvine Auditorium

Chair: Deborah Yelon (Northeast Representative), New York Univ

9:00 *Skin, scales and fins: Genetic analysis of the development of adult integumentary structures in the zebrafish.* **C. Nüsslein-Volhard**, Max Planck Inst, Tübingen, Germany

9:30 52 *The role of GPI-anchored proteins in chondrogenesis and cell polarity.* **M.J. Ahrens**, A.T. Dudley. Dept of Biochemistry, Molecular Biology and Cell Biology, Northwestern University, Evanston, IL

9:45 53 *Organ size control in mice.* **B.Z. Stanger**. AFCRI and Department of Medicine, University of Pennsylvania, Philadelphia, PA

10:15 54 *Hoxb5b acts downstream of retinoic acid signaling in the forelimb field to restrict heart field potential in zebrafish.* **J.S. Waxman**, B.R. Keegan, R.W. Roberts, K.D. Poss, D. Yelon. Skirball Institute, NYU School of Medicine, New York, NY; Duke University Medical Center, Durham, NC

10:30 Coffee Break

11:00 55 *Finding closure: visualizing the cell behaviors and uncovering the genetics of neural tube closure.* **L.A. Niswander**. Dept. of Pediatrics, Univ. of Colorado School of Medicine, Aurora, CO

11:30 56 *A Hedgehog-Dependent Extra-Cardiac Lineage Required for Atrial Septation.* A.D. Hoffmann, M.A. Peterson, **I.P. Moskowitz**. Dept. of Pediatrics and Pathology, The University of Chicago, Chicago, IL

11:45 57 *The Vertebrate Segmentation Clock: Converting Time into Embryonic Patterns.* **O. Pourquié**. HHMI/Stowers Institute for Medical Research, Kansas City, MO

12:15 58 *A Role for kurlly in Left-Right Patterning, Kidney Cysts, and Cilia.* **J. Schottenfeld**, R.D. Burdine. Dept. of Mol. Biol., Princeton University, NJ

Symposium 8: Gene Expression and Epigenetics

Logan Hall G17

Chair: Mary Mullins (Secretary), Univ of Pennsylvania

9:00 *Developmental gene control by Pol II elongation in Drosophila.* **M. Levine**, UC Berkeley, CA

9:30 59 *Identification and analysis of novel Spemann/Mangold organizer genes.* **H. Lickert**, D. Kinzel, I. Bartscher, D. Truembach, K. Boldt, M. Ueffing. Institute of Stem Cell Research; Institute of Developmental Genetics; Institute of Human Genetics, Helmholtz Zentrum München, Neuherberg, Germany

9:45 60 *Cell fate and pluripotency in the mouse embryo.* **M. Zernicka-Goetz**. Gurdon Institute, Cambridge, UK

10:15 61 *Histone deacetylase 1 (HDAC1) regulates histone acetylation, development, and gene expression in preimplantation mouse embryos.* **P. Ma**, R.M. Schultz. Dept. of Biology, Univ of Pennsylvania, Philadelphia, PA

10:30 Coffee Break

11:00 62 *Epigenetic reprogramming of the Arabidopsis paternal genome after fertilization.* C. Baroux, M. Raissig, D. Autran, S. Grob, A. Steimer, J. Vielle-Calzada, O. Leblanc, D. Grimanelli, **U. Grossniklaus**. Inst of Plant Biology & Zürich-Basel Plant Science Center, Univ of Zürich, Switzerland; IRD, Inst de Rech pour le Devel, Montpellier, France ; Lab of Reprod Dev and Apomixis, Ctr de Invest y Estudios Avanzados, Guanajuato, Mexico.

11:30 63 *Roles of Neurogenin and Geminin in Vertebrate Neurogenesis.* **J. Lim**, K.L. Kroll. Washington University School of Medicine, Dept. of Developmental Biology, St. Louis, MO

11:45 64 *Distinctive Chromatin at Promoters for Embryo Development in Sperm.* **B.R. Cairns**, S. Hammoud, D. Nix, H. Zhang, J. Purwar, D. Carrell. HHMI and Huntsman Cancer Inst, Univ of Utah School of Medicine; Depts of Surgery, Obstetrics and Gynecology, Univ of Utah School of Medicine, Salt Lake City, UT

12:15 64 *β -Catenin-Mediated Histone Arginine Methylation Poises Organizer Genes for Expression Prior to the MBT.* **S.A. Blythe**, P.S. Klein. Univ of Pennsylvania, Philadelphia, PA

Symposium 9: Mitosis and Cell Polarity

Amado Recital

Chair: David Raible (Northwest Representative), Univ of Washington

9:00 65 *Contact-mediated radial polarization of the early C. elegans embryo.* **J. Nance**, D.C. Anderson, J.S. Gill, R.M. Cinalli. Skirball Institute, NYU School of Medicine, NY

9:30 66 *Evolutionary plasticity of developmental mechanisms: evidence from the asymmetric second cleavage of the Helobdella (leech) embryo.* **D.C. Lyons**, X. Ren, D.A. Weisblat. UC Berkeley, Berkeley CA; University College, London, UK

9:45 *Using the C. elegans embryo to dissect cell division mechanisms.* **K. Oegema**, UC San Diego, CA

10:15 67 *Spermidine and spermatid differentiation of Marsilea vestita.* **F. Deeb**, S.M. Wolniak. Dept. of Cell Biology and Molecular Genetics, Univ. of Maryland, College Park, MD

10:30 Coffee Break

11:00 *Planar polarity and modeling.* **C. Tomlin**, UC Berkeley, CA

11:30 68 *Noncanonical Frizzled dependent signaling controls chondrocyte polarity during cartilage morphogenesis.* **A.T. Dudley**, Y. Li. Department of Biochemistry, Molecular Biology and Cell Biology, Northwestern University, Evanston, IL

11:45 69 *Polarising Migrating Tissues During Organogenesis.* **D. Gilmour**, P. Haas, G. Cakan, V. Lecaudey, J. Colombelli, E. Stelzer. Cell Biology and Biophysics, EMBL Heidelberg, Germany

12:15 70 *Crag is a novel regulator of epithelial architecture and polarized deposition of basement membrane proteins in Drosophila.* **N. Denef**, Y. Chen, S.D. Weeks, G. Barcelo, T. Schupbach. HHMI, Dept. of Molecular Biology, Princeton Univ., Princeton, NJ; Dept. of Biochemistry and Molecular Biology, Drexel Univ. College of Medicine, Philadelphia, PA

12:30 pm – 2 pm Lunch with poster and exhibit viewing.
Posters and Exhibit tear down at end of session

Houston Hall

2 - 5 pm

Plenary Session III

Irvine Auditorium

Chair: Eric Wieschaus (President), Princeton Univ

2:00 71 *Regulatory logic of neuronal diversity: Neuronal selector genes and selector motifs.* **O. Hobert**. Columbia University Medical Center, HHMI. New York, NY

2:40 *Mechanisms of nuclear reprogramming.* **K Eggan**, Harvard Univ, Cambridge, MA

3:10 72 *The Mütter Museum of the College of Physicians of Philadelphia: An Introduction to its History and Resources for the Teaching of Human Developmental Biology.* **G.B. Grunwald**. Dept. of Pathology, Anatomy and Cell Biology, Thomas Jefferson University, Philadelphia, PA

3:40 73 *Fibrodysplasia ossificans progressiva (FOP) – How does one tissue become another?* **E.M. Shore**. Departments of Orthopaedics and Genetics, and the Center for Research in FOP and Related Disorders, University of Pennsylvania, Philadelphia, PA

4:10 **Presentation of the Best Student Poster Competition Winners**
Dominique Bergmann (SDB Junior Faculty Representative), Stanford

6 pm – 10 pm **Closing Reception at Mütter Museum**
Session sponsored by the Institute for Regenerative Medicine, U Pennsylvania

Wednesday, July 30

Departure

8:30 am - 3 pm **SDB Board of Directors Meeting**

ACKNOWLEDGMENTS

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Contributors: *Developmental Biology* (Elsevier), Department of Cell and Developmental Biology-University of Pennsylvania, Gene Tools, Genentech, *genesis*, Institute for Regenerative Medicine-University of Pennsylvania, Sutter Instrument Co.

Exhibitors: RIKEN Center for Developmental Biology; Aquatic Habitats, Gene Tools, Hölle & Hüttner AG, Intavis Inc, Leica Microsystems, Photonic Instruments Inc, R&D System Inc, EMAGE Gene Expression Database; Elsevier, Cell Press, Cold Spring Harbor Lab Press, *Developmental Dynamics*, Nature Publishing Group, Royal Society Publishing, The Company of Biologists, Wiley-Blackwell.

POSTER SESSIONS

Poster Session I

Houston Hall: Hall of Flags, Bodek Lounge, Class of 49

Poster Session I themes: Education, Development and Evolution, Morphogenesis, Cell-cell Signaling, Intracellular Signaling Pathways, Cell Fate Specification, Cell Motility and Guidance, Cell Proliferation, Germ Cells and Gametogenesis, Fertilization, Stem Cells and Tissue Regeneration, Molecular Medicine and Development.

Viewing: Sat, July 26, 9-11 PM; Sun, July 27, 12:30-2 PM, 8-11 PM

Author presentation: Sun, July 27

Odd board numbers – 8-9:30 PM

Even board numbers – 9:30-11 PM

Abstract Program Number in Italics

B# = Poster Board Numbers

Education

L2 B0 Integrating Writing and Research into an Undergraduate Developmental Biology Course. **J.W. Brittingham, J.M. Thorn.** Dept. Biology, Simpson College, Indianola, IA, USA; Dept. Biology, Knox College, Galesburg, IL, USA.

L3 B00 Use of an Improved Isolated Chicken Embryonic Heart In Vitro System to Study Vertebrate Heart Development and Physiology. **J.S. McLaughlin, F.M. Abidi, J.C. Hinkle.** Dept. of Biology, Penn State Univ., Fogelsville, PA USA.

74 B1 Animations as supplemental resources for biology course. **J.D. Thatcher.** Structural Biology Division, WV School of Osteopathic Medicine, Lewisburg, WV, USA.

75 B2 A seminar that introduces freshmen to biology research and researchers. **D.R. Phillips, A.W. Woodward, B. Bartel.** Dept. of Biochem. and Cell Biol., Rice Univ., Houston, TX, USA.

76 B3 Engaging Undergraduates in the Scholarship of Discovery Using a Drosophila Deficiency Screen. **M.C. Bloch-Qazi.** Dept. of Biol, Gustavus Adolphus College, St. Peter, MN, USA.

77 B4 Introducing undergraduates to Zebrafish Development and Genetics in a large Introductory Biology laboratory. **A. D'Costa, I. Shepherd.** Dept. of Biology, Emory Univ., Atlanta, GA, USA; Div. of Science & Tech., Georgia Gwinnett College, Lawrenceville, GA, USA.

78 B5 Teaching the Toolkit: A Laboratory Series to Demonstrate the Evolutionary Conservation of Metazoan Cell-Signaling Pathways. **E.E. LeClair.** Dept. of Biological Sciences, DePaul Univ., Chicago, IL

79 B6 A Developmental Biology/Medical Ethics Undergraduate Learning Community: a novel approach to explore value-laden social and ethical issues related to developmental biology. **K.R. Douglas, D.E. Lee.** Biology Department, Augustana College, Rock Island, IL, USA; Religion Department, Augustana College, Rock Island, IL, USA.

80 B7 Opportunities to present your successful teaching and outreach experiences at SDB meetings and website. **I. Chow.** Soc for Devel Biol, Bethesda, MD

Development and Evolution

81 B8 Evolutionary Mutant Models for Human Disease. **C. Albertson, W. Cresko, W. Detrich, J. Postlethwait.** Dept. of Biology, Syracuse Univ., Syracuse, NY, USA; Center Ecol. & Evol. Biol, Univ. Oregon, Eugene, OR, USA; Dept. of Biology, Northeastern Univ., Boston, MA, USA; Instit. of Neuroscience, Univ. Oregon, Eugene, OR, USA.

82 B9 A Chimeric chromosome in *Oxytricha trifallax*. **H. Wubneh, Y. Zhou, L.F. Landweber.** Dept. of Mol. Biol. Princeton Univ., NJ 08544; Dept. of Ecol. and Evol. Biol. Princeton Univ., NJ 08544.

83 B10 Shared hunchback-like expression in feeding and locomotory structures suggests a single origin of larvae within lophotrochozoa. **R. Savage, A. Ferguson, K. Yandell, M. Drzyzga, K. Anderson, M. Lliguicota, A. Iyer, X. Zeng.** Biology Department, Williams College, Williamstown, MA 01267.

84 B11 Function and phylogenetics of the NR2E nuclear receptors in *C. elegans*. **C. Alvaro, K. Weber, J. Fiske-Baier, S. Clever, B. Wightman.** Biology Department, Muhlenberg College, Allentown, PA 18104 USA.

85 B12 A novel Pax gene controls the formation of stem cells in the leech embryo. **M. Schmerer, R. Savage, M. Shankland.** Section of Mol. Cell and Dev. Biol., UT Austin, Austin, TX, USA; Biology Dept., Williams College, Williamstown, MA, USA.

86 B13 Function of vascular endothelial growth factor receptor of cephalopod, *Idiosepius paradoxus*. **M. Yoshida, K. Tsuneki, H. Furuya.** Dept. of Biol. Sci., Grad. Sch. of Sci., Osaka Univ., Osaka, Japan.

87 B14 Molecular Characterization of Pea Aphid Facultative Parthenogenesis. **D.G. Srinivasan, G.K. Davis, D.L. Stern.** Dept. of Ecology & Evolutionary Biology, Princeton Univ, Princeton, NJ.

88 B15 Evolution of the *Drosophila* larval trichome pattern through cis-regulatory mutations at an enhancer of a single gene. **G.K. Davis, L. Sillers, P. Parikh, A. McGregor, V. Orgogozo, I. Delon, J. Zanet, D.G. Srinivasan, F. Payre, D.L. Stern.** Dept. of Ecol. and Evol. Biol., Princeton University, Princeton, NJ, USA; Centre de Biologie du Developpement, Toulouse, France.

89 B16 Evolution of the *Drosophila* folded gastrulation gene. **R.E. Hoang, K. Dao, M. Eghbal, T. Tripp.** Dept. of Biology, Haverford College, Haverford, PA, USA.

90 B17 Temperature-tolerance and protein stability assays of *Drosophila melanogaster*. **U. Marseille, J. Lutshumba, K. Venescar, K. Bullon, D. Decicco, M. Enechukwu, R. Pu.** Department of Biological Sciences, Kean University, Union, NJ, USA.

91 B18 Analyzing the role of CtBP in *Drosophila* eye development. **B. Micheal, C. Hoang, A. Sandoval, J. Curtiss.** NMSU.

- 92 B19 FoxO3 Regulation of Retinal Progenitor Cells in Vertebrate Eye Development. **M.E. Holly, H.M. El-Hodiri**. Int. Biomed. Sciences Grad. Prog., The Ohio State University, Col., OH, USA; Dept. of Mol. and Human Genetics, The Research Institute at Nationwide Children's Hospital, Columbus, OH, USA.
- 93 B20 The PDZ Proteins, Dlg-1 and Scrib, are Required for Lens Fiber Cell Differentiation in the Mouse. **I. Yamben, R. Rachel, N. Copeland, N. Jenkins, A. Griep**. Dept. of Anatomy, UW-Madison, Madison, WI; Mouse Cancer Genetics, NCI-Frederick, Frederick, MD.
- 94 B21 Functional and Evolutionary Characterization of the Glutamic Acid Decarboxylase 67 and Glycine Transporter 2 Promoter. **L. Boyd, C. Sipe, D. Teasley, M.S. Saha**. Dept. of Biol., College of William and Mary, Williamsburg, VA, USA.
- 95 B22 Evolution of SoxB1 regulation and function: neural development from marine worm to frog. **C.D. Rogers, D.D. Cunningham, E.M. Silva Casey**. Dept. of Biol., Georgetown Univ., Washington, DC USA.
- 96 B23 Function and Regulation of *Xenopus laevis* Sox21. **D.D. Cunningham, E.M. Silva Casey**. Department of Biology, Georgetown University, Washington DC, USA.
- 97 B24 Development of the central catecholamine systems in a frog without a tadpole. **G.R. Ten Eyck, W.J. Jermakowicz, C.H. Summers**. Dept of Basic Science and Craniofacial Biology, New York University, NY, NY, USA; Dept of Cell and Developmental Biology, Vanderbilt University Medical Center, Nashville, TN, USA; Dept of Biology and Neuroscience Group, University of South Dakota, Vermillion.
- 98 B25 Small Molecule-Mediated “Phenotypic Engineering” Reveals A Role For Retinoic Acid In Anuran Gut Evolution. **S. Bloom, C. Infante, A. Everly, J. Hanken, N. Nascone-Yoder**. Dept. Molecular Biomedical Sciences, College of Vet Medicine, North Carolina State Univ.; Museum of Comparative Zoology and Dept. Organismic & Evolutionary Biology, Harvard Univ.
- 99 B26 Conservation in a frog of the retinoic acid requirement for forelimb initiation. **R.P. Elinson, Z. Walton, S. Lee, K. Nath**. Dept. Biological Sciences, Duquesne University, Pittsburgh, PA, USA.
- 100 B27 In Limb Development BMP and FGF Signaling Interact through Sproutys. **S. Underwood, T. Williams, Y. Mishina, M. Lewandoski**. Cancer and Developmental Biology Laboratory; NCI-Frederick, NIH, Frederick, MD, USA; Cell and Developmental Biology, University of Colorado Health Science Center, Aurora CO, USA; Laboratory of Reproductive and Developmental Toxicology, NIEHS, NIH, Research Triangle Park, NC, USA
- 101 B28 Building a marsupial neonate: evolution of the limb development program in opossum. **A.L. Keyte, T. Imam, M. Alonzo, T. Halbert, K.K. Smith**. Dept. of Biol., Duke Univ., Durham, NC, USA.
- 102 B29 Evolution of Hox PG2 Gene Content in Teleosts. **A. Davis, J. Scemama, E.J. Stellwag**. Dept. of Biology, East Carolina Univ., Greenville, NC, USA.
- 103 B30 Evolutionary developmental biology of teleostean pharyngeal arch specification. **P. Le Pabic, E.J. Stellwag, J. Scemama**. Department of Biology, East Carolina University, Greenville, NC, USA.
- 104 B31 Investigating a role for *trpm7* function in physiologic cation homeostasis. **M.R. Elizondo, D.M. Parichy**. Department of Biology, University of Washington, Seattle WA 98195; Graduate Program in Cell and Molecular Biology, University of Texas at Austin, Austin TX 78712.
- 105 B32 Molecular mechanisms underlying skeletal variation in zebrafish. **M.H. Connolly, B.K. Hall**. Department of Biology, Dalhousie University, Halifax, NS, Canada.

- 106 B33 Fibroblast Growth Factor Signaling in Skeletal Evolution. **N. Rohner, M. Harris, M. Bercsényi, L. Orban, C. Nüsslein-Volhard.** MPI for Dev. Biol., Tuebingen Germany; Univ. of Pannonia, Keszthely, Hungary; Temasek Life Sciences Laboratory, National Univ. of Singapore.
- 107 B34 Exploring the Developmental and Evolutionary Relationship between Cardiac and Blood/Endothelial Precursors. **A.C. Simões, T. Peterkin, R. Patient.** MHU, Weatherall Institute of Molecular Medicine, University of Oxford, UK.; PDBEB, Center for Neuroscience and Cell Biology, University of Coimbra, Portugal.
- 108 B35 Targeted disruption of the Mohawk homeobox gene results in tendon defects in mice. **W. Liu, S.S. Watson, R. Schweitzer, R. Jiang.** Department of Biomedical Genetics and Center for Oral Biology, University of Rochester School of Medicine and Dentistry, Rochester, NY, USA; Shriners Hospital for Children, Research Division, Portland, Oregon, USA.
- 109 B36 Persistent Expression of Pax3 in Neural Crest Causes Cleft Palate and Defective Osteogenesis. **M. Wu, J. Li, K.A. Engleka, B. Zhou, M. Lu, J. Plotkin, J.A. Epstein.** Dept. of Cell and Developmental Biology, University of Pennsylvania, PA, USA; Dept. of Microbiology, University of Pennsylvania, PA, USA.
- 110 B37 Late Emerging Trunk Neural Crest Cells in the Turtle *Trachemys scripta* Revealed by DiI Injection and Neural Tube Organ Culture. **J.A. Cebra-Thomas, Y. Hu, J. Vogelsong, M. Yin, L. Gyi, A. Terrell, S.F. Gilbert.** Department of Biology, Millersville University, Millersville, PA, USA; Department of Biology, Swarthmore College, Swarthmore, PA, USA; Science Division, Friends Central School, Wynnewood, PA, USA.
- 111 B38 Development of the carapacial ridge: implications for the evolution of genetic networks in turtle shell development. **J.E. Moustakas.** Dept. of Integrative Biology, University of California, Berkeley CA USA; Museum of Paleontology, University of California, Berkeley CA USA.
- Morphogenesis**
- 112 B39 Addressing the role of extrinsic cues in neuronal polarization. **S.K. Gupta, R. Mishra, D. Juncker, K.F. Meiri, S. Mani.** National Brain Research Centre, Manesar, Gurgaon, Haryana-122050, India; McGill University Montreal, Canada; Tufts University School of Medicine; Boston, MA, USA.
- 113 B40 Growth dynamics of clusterized neuronal network in vitro. **L. Guo-An, T. Chen-Yu, .** Department of Physics and Institute of Biophysics, National Central University, Jhong-Li, Taiwan 32001, Republic of China.
- 114 B41 *Twist1* is required for Cardiac Neural Crest Morphogenesis. **J.W. Vincentz, R.M. Barnes, R. Rogers, B.A. Firulli, S.J. Conway, A.B. Firulli.** Wells Center for Pediatric Research, Indiana University School of Medicine, Indianapolis, IN, USA.
- 115 B42 Axon Branching in Spiral Ganglion Neurons. **C. Lu, J. Appler, L. Goodrich.** Dept. of Neurobiology, Harvard Medical School, Boston, MA.
- 116 B43 Polarization of Retinal Amacrine Cells by the Atypical Cadherin Fat3. **M.R. Deans, L.V. Goodrich, .** Dept. of Neurobiology, Harvard Medical School, Boston, MA, USA.
- 117 B44 Morphogenesis of the mouse node depends on the FERM domain protein Epb4.115. **J.D. Lee, K.V. Anderson, .** Developmental Biology Department, Sloan-Kettering Institute, New York, NY USA.

- 118 B45 Bmp2 in the visceral endoderm directs anterior morphogenesis during gastrulation. **M.E. Madabhushi, G. Kwon, K. Hadjantonakis, L. Lacy.** Dept. of Dev. Biol., Sloan Kettering Institute, New York, NY USA; Weill Graduate School of Medical Sciences of Cornell University.
- 119 B46 Cell behaviors during endoderm morphogenesis in the mouse gastrula. **M. Viotti, G.S. Kwon, K. Hadjantonakis.** Dev. Bio. Program, Sloan-Kettering Institute, New York, NY, USA; BCMB Program, Weill Grad. School of Med. Sci. of Cornell Univ., New York, NY, USA; Neuroscience Program, Weill Grad. School of Med. Sci. of Cornell Univ., New York, NY, USA.
- 120 B47 From the Tilted Mouse to the Otopetrin Gene Family: Molecular Insights into Development of the Vestibular Mechanosensory System. **D.M. Ornitz, E. Kim, I. Hughes, B. Hurle, Y. Lundberg, M. Warchol.** Dept of Dev. Biol., and Otolaryngology, Wash U. St. Louis, MO; Boys Town Natl. Res. Hosp., Omaha, NE.
- 121 B48 The Ig superfamily protein Lrig3 controls inner ear morphogenesis by regulating Netrin-1 expression. **V.E. Abraira, A.F. Tucker, L.V. Goodrich.** Dept. of Neurobiology, Harvard Medical School, Boston MA, USA.
- 122 B49 The Kinome of Lung Branching Morphogenesis – A Systems Approach to Identify Phosphoregulators of Mouse Lung Development. **C. Schnatwinkel, A. Minic, L. Niswander.** Dept. of Pediatrics, HHMI, UCDHSC, Aurora, CO, USA.
- 123 B50 Cleftin: a Novel Fibronectin-induced Gene that Promotes Branching Morphogenesis. **T. Onodera, T. Sakai, K.M. Yamada.** NIDCR, NIH, Bethesda, MD, USA; Oral-Facial Disorders, Osaka University, Osaka, Japan.
- 124 B51 A novel region in the murine allantois may prevent branching morphogenesis. **J.M. Daane, K.M. Downs.** Department of Anatomy, University of Wisconsin-Madison School of Medicine and Public Health, 1300 University Avenue, Madison, WI 53706.
- 125 B52 Notch signaling acts at multiple stages to regulate bile duct morphogenesis. **Y. Zong, A. Panikkar, B.Z. Stanger.** Abramson Family Cancer Research Institute, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, USA; Cell and Molecular Biology Graduate Group, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, USA,;
- 126 B53 Visualizing morphogen distribution in lumen. **T. Miura.** Dept Anat Dev Biol, Kyoto Univ Grad Sch Med; JST CREST, PRESTO.
- 127 B54 Shh signaling regulates reciprocal epithelial-mesenchymal interactions controlling palate development. **Y. Lan, R. Jiang.** Center for Oral Biology and Department of Biomedical Genetics, University of Rochester School of Medicine and Dentistry, Rochester, NY, USA.
- 128 B55 Wnt2 signaling regulates morphogenesis of the inflow tract and atrioventricular canal during cardiac development. **Y. Tian, A.M. Goss, Z. Wang, T.P. Yamaguchi, E.E. Morrisey.** Dept. of Med, Univ. of Penn., Philadelphia, PA, USA; NCI, Frederick, MD, USA.
- 129 B56 Daam1 is required for mouse heart morphogenesis. **E. Cohen, E.E. Morrisey.** University of Pennsylvania, Philadelphia, PA 19104.
- 130 B57 LR asymmetric morphogenesis of heart looping. **S. Cheng, B. Graham, R. Sound, G. Schoenwolf, Y. Saijoh.** Dept Neurobiolo & Anatomy, Univ Utah.

- 131 B58 Inturned PCP effector gene is required for cilia biogenesis and mouse embryonic development. **A. Liu, H. Zeng, W. Wu, A. Wynkoop, L. Niswander, A. Liu.** Dept. of Biol., Penn State Univ, University Park, PA, USA; Dept. of Pediatrics, UCHSC, Aurora, CO, USA.
- 132 B59 Patterning of the mouse embryonic germ layers: the Townes and Holtfreter cell sorting experiments revisited. **R. Moore, K.Q. Cai, X. Xu.** Dept. of Medical Oncology, Fox Chase Cancer Center, Philadelphia, PA; Dept. of Medicine, UM/Sylvester Comprehensive Cancer Center, Miami, FL.
- 133 B60 Sequential Roles of Wnt signaling/beta-catenin in mouse ventral dermal development. **R. Atit, J. Ohtola, J. Myers, B. Akhtar-Zaidi, D. Zuzindlak, P. Sandesara, S. Mackem.** Dept of Biology, Case Western Reserve University, OH,USA; Laboratory of Pathology, National Cancer Institute, Bethesda, MD, USA; Dept of Genetics and Dept of Dermatology, Case Western Reserve University, OH,USA.
- 134 B61 Role of Nectins in the development of epithelial appendages. **Y. Toshiyuki, J. Miyoshi, Y. Takai, I. Thesleff.** Inst of Biotechnology, Univ of Helsinki, Finland; Dept of Molec Dell Biol, Kobe Univ Grad Sch of Medicine, Japan.
- 135 B62 Fgfr2b signaling integrates tooth morphogenesis and dental axon patterning. **P. Kettunen, K. Luukko.** Department of Biomedicine, University of Bergen, Norway.
- 136 B63 Development of successional teeth. **M. Buchtova, S. Balkova, E. Matalova, I. Misek.** Inst of Anim Physiol and Gen, Czech Rep; Univ of Vet and Pharm Sci Brno, Czech Rep.
- 137 B64 Characterization of Tmem16f in vertebrate development. **D. Iribarne, J.R. Rock, B.D. Harfe.** Department of Molecular Genetics and Microbiology, Genetics Institute, University of Florida, Gainesville, FL, USA.
- 138 B65 Emx2 in Limb Dorsalization. **K. Kanaya, J.M. Feenstra, C.U. Pira, K.C. Oberg.** Dept Pathology and Human Anatomy, Loma Linda University, Loma Linda, CA.
- 139 B66 The role of FGF4 and FGF8 in posterior development of the mouse embryo. **A.M. Boulet, M.R. Capecchi.** Dept. of Human Genetics, HHMI/University of Utah, Salt Lake City, UT.
- 140 B67 Examining the roles of Lunatic fringe during secondary body formation. **S.E. Cole, E.T. Shifley, D. Walker.** Dept. of Mol. Genetics, The Ohio State University, Columbus, OH.
- 141 B68 A genetic screen for situs abnormalities. **N. Dominic, A. Ermakov, J. Stevens, S. Field, P. Goggolidou, N. Powles-Glover.** MRC Harwell, Oxfordshire OX11 0RD UK.
- 142 B69 A Potential Link between Fetal Exposure to Deet and Birth Defects in Chick Development. **J. Nagle, C.L. Rosch.** Biology Dept, Kutztown University, Kutztown, PA USA.
- 143 B70 Analysis of Fgf gene expression patterns in the ear-forming region of the chick. **M. Kumar, S.C. Chapman.** Biological Sciences, 132 Long Hall, Clemson University, Clemson, SC, 29634.
- 144 B71 Expression Patterns of Cadherin-6B in Chick Limb Development. **M.R. Determan, A.F. Paulson.** Dept. of Biol., Univ. of South Dakota, Vermillion, SD, USA.
- 145 B72 Withdrawn
- 383 B73 Repression of genes by Snail2 during avian neural crest emigration. **L.A. Taneyhill.** Department of Animal Sciences, University of Maryland, College Park, MD 20742 USA.

- 147 B74 Ephrin B2 coordinates the formation of a morphological boundary and cell epithelialization during somite segmentation. **T. Watanabe, Y. Sato, Y. Takahashi.** Graduate School of Biological Sciences, NAIST, Nara, Japan.
- 148 B75 Expression of agrin in the early embryo. **E. Kapolou, N. Zagris.** Dept. of Biol., Univ. of Patras, Patras, Greece.
- 149 B76 *Xenopus* ADAM19 is critical for Neural and Muscle Development. **R. Neuner, H. Cousin, C. McCusker, M. Coyne, D. Alfandari.** Dept of Vet and Animal Science, Univ of Mass. Amherst, MA, USA.
- 150 B77 Maintaining the Balance: Regulation of Cadherin-11 by ADAM13 during Cranial Neural Crest Migration in *Xenopus laevis*. **C.D. McCusker, R.D. Neuner, H. Cousin, D. Alfandari.** Univ. of Mass., Amherst, MA.
- 151 B78 ADAM metalloproteases control of cell specification and cell migration during early embryogenesis. **D.R. Alfandari, H. Cousin, C. McCusker, R. Neuner.** Dept of Vet & Animal Sciences, Umass, Amherst, MA, USA.
- 152 B79 Characterization of a new factor in the non-canonical Wnt signaling. **W. Liu, D. Khadka, A. Sato, R. Bharti, R. Habas.** Dept. of Biochemistry, RWJMS-UMDNJ, Piscataway, NJ, USA; The Cancer Institute of New Jersey, New Brunswick, NJ, USA.
- 153 B80 delta-catenin regulates *Xenopus* developmental morphogenesis. **D. Gu, A.K. Sater, H. Ji, M. Clark, S.A. Stratton, M.C. Barton, Q. Lu, P.D. McCrear.** Dept. of Biochemistry & Molecular Biology, UT MD Anderson Cancer Center, Houston, TX; Program in Genes & Development, UT GSBS, Houston, TX; Dept. of Biology & Biochemistry, University of Houston, Houston, TX; Dept. of Anatomy & Cell Biology, East Carolina.
- 154 B81 Heterotaxin: A novel pyridine compound that perturbs left-right asymmetric organ morphogenesis. **M. Parr, D. Young, M. Dush, A. Dieters, N. Nascone-Yoder.** Molecular Biomedical Sci, College of Veterinary Medicine; Dept. Chemistry, North Carolina State Univ, Raleigh, NC.
- 155 B82 Basolumenal endoderm intercalation: A geometrically unique execution of convergent extension during gut tube elongation. **N. Nascone-Yoder, R. Reed, M. Womble, M. Dush, S. Bloom, R. Tull, A. Morckel.** Molecular Biomedical Sciences, College of Veterinary Medicine, North Carolina State Univ, Raleigh, NC, USA
- 156 B83 Stiffening of the vertebrate embryo during axis elongation depends on actomyosin contractility. **L. Davidson, H. Kim, J. Zhou.** Dept. of Bioengineering, Univ. of Pittsburgh, Pittsburgh, PA, USA.
- 157 B84 Regulation of cytoarchitecture in development: the roles of IQGAP2, C-cadherin and Cdc42 in the early *Xenopus* embryos. **Q. Tao, S. Nandadasa, S. Lang, J. Heasman, C. Wylie.** Division of Developmental Biology, Children's Hospital Medical Center.
- 158 B85 A tale of two tails: Multiple pathways regulate cell adhesion and morphogenesis in the zebrafish tail. **C. Thorpe, Y. Yang.** Division of Biology, Kansas State University, Manhattan, KS USA.
- 159 B86 Neuregulin-mediated ErbB3 signaling is required for DRG neuron formation. **Y. Honjo, J.S. Eisen.** Institute of Neuroscience, University of Oregon, Eugene 97403-1254.
- 160 B87 A role for zic genes during neural tube morphogenesis in zebrafish. **Y. Grinblat, M. Nyholm, A. Taylor, S. Burgess.** Zoology and Anatomy, University of Wisconsin, Madison, WI, USA; NIH, Bethesda, MD, USA.

- 161 B88 Requirements for ovo orthologues in zebrafish neural tube and neural crest development. **S. Piloto, T. Schilling.** UC-Irvine.
- 162 B89 The zebrafish *dob/fgf20a* mutant models human craniosynostotic syndromes with midfacial hypoplasia. **W. Cooper, R. Albertson.** Dept. of Biology, Syracuse Univ., Syracuse, NY, USA.
- 163 B90 Craniofacial phenotypes of the *knypek* (*glypican4*) mutant zebrafish. **E.E. LeClair, S. Mui, A. Huang, J.M. Topczewska, J. Topczewski.** Dept. of Biol. Sci., DePaul Univ., IL, USA; Dept. of Pediatrics, CMRC, Northwestern Univ., IL, USA.
- 164 B91 *vgl-2a* is Required for Endodermal Pouch Morphogenesis in Zebrafish Craniofacial Development. **C. Johnson, W. Feng, T. Williams, K.B. Artinger.** University of Colorado Health Sciences Center Program of Molecular Biology; University of Colorado Health Sciences Center Department of Craniofacial Biology.
- 165 B92 Wnt signals facilitate behavioral transitions during zebrafish pancreas morphogenesis. **J. Rhee, B. Ghosh, M. Knabel, M. Parsons, S. Leach.** Surgery Department, Johns Hopkins University School of Medicine, Baltimore, MD, USA.
- 166 B93 Zebrafish Wnt signaling co-operates with FAK in controlling slow muscle alignment along myotome boundaries. **S. Chong, L. Nguyet, Y. Jiang.** Dept. Developmental Signaling and Patterning, Institute of Molecular and Cell Biology, 61 Biopolis Drive, 138673 Singapore.
- 167 B94 Regulation of cardiac morphogenesis in zebrafish by HAND2. **Z.V. Garavito-Aguilar, D. Yelon.** Developmental Genetics Program, Skirball Institute, NYU School of Medicine, New York, NY, USA.
- 168 B95 Elucidating mechanisms of left-right patterning in vertebrate embryos. **C.E. Slagle, R.R. Burdine.** Dept. of Mol. Bio., Princeton Univ., Princeton, NJ, USA.
- 169 B96 Serum Amyloid A is required for hedgehog signaling in zebrafish morphogenesis. **P.S. Page-McCaw, V. Valakh, K. Mann, Z. Ye, W. Colon.** Dept. of Biology, CBIS, RPI, Troy, NY 12180; Dept. of Chemistry, CBIS, RPI, Troy, NY 12180.
- 170 B97 *gadd45b* is expressed at the determination front and is regulated by Fgf and RA signaling during zebrafish somitogenesis. **K.S. Brown, S.L. Amacher.** Dept. of Molecular and Cellular Biol., University of California, Berkeley.
- 171 B98 Coupling vs. Noise: The Rise and Fall of Synchrony in the Segmentation Clock. **I.H. Riedel-Kruse, M. Claudia, O.C. Andrew.** Division of Biology, California Institute of Technology, Pasadena, CA, USA; Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany.
- 172 B99 Examining the role of the *C. elegans* uterine Anchor Cell in vulva morphogenesis. **K. Estes, W. Hanna-Rose.** Dept. of Biochem, Mol. Bio, Pennsylvania State Univ., University Park, PA.
- 173 B100 Notch Signaling and Morphogenesis of Single-Cell Tubes in the *C. elegans* Digestive Tract. **J. Rasmussen, K. English, J. Tenlen, J.R. Priess.** Fred Hutchinson Cancer Research Center, Seattle, WA 98109, USA.; Howard Hughes Medical Institute; Molecular and Cellular Biology Program, University of Washington, Seattle, WA 98195, USA.
- 174 B101 Mutagenesis Screen In *C. elegans* Suggests Role Of *mor* Genes In Pharyngeal Development. **A.R. Ferrier, P.A. Smith.** Dept. of Biol., Lake Forest College, Lake Forest, IL, USA.

- 175 B102 Overcoming Genetic Redundancy to Identify Proteins Acting In *C. elegans* Gastrulation. **J. Sawyer, T. Li, B. Goldstein.** Department of Biology, University of North Carolina at Chapel Hill.
- 176 B103 Live imaging reveals that myoblast fusion requires dynamic remodeling of the actin cytoskeleton. **M. Baylies, S. Nowak, B. Richardson.** Program in Developmental Biology, Sloan Kettering Institute, NY, NY; Weill Graduate School at Cornell Medical School, NY, NY.
- 177 B104 Rho-Kinase and Myosin Heavy Chain are Required for Epithelial Morphogenesis in the *Drosophila* Embryo. **R. Simone, S. DiNardo.** Dept. of Cell and Dev. Biol., University of Pennsylvania, Philadelphia, PA.
- 178 B105 The *Drosophila* gene dead man walking (*dmw*) has pleiotropic effects on embryonic morphogenesis and the larval/pupal transition, and interacts genetically with alphaPS3 integrin and Sternopleural (*Sp*). **M.B. Dinkins, J.T. Warren, L.I. Gilbert, E.K. LeMosy.** Dept. of Cellular Biol. and Anatomy, Medical College of GA, Augusta, GA; Dept. of Biol., Univ of NC-Chapel Hill.
- 179 B106 Proteomic Analysis of *Drosophila* Fragile X Mutant Cleavage Stage Embryos. **K. Monzo, S.R. Dowd, J.S. Minden, J.C. Sisson.** MCDB, The University of Texas at Austin, Austin, TX; The Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA.
- 180 B107 Serotonin synthesis is necessary for gastrulation in the sea urchin, *Lytechinus pictus*. **T.A. Scully, K.N. Carroll, K.M. Brown.** Dept. Biological Sciences, George Washington Univ., Washington DC 20052.
- 181 B108 Role of serotonin in sea urchin embryo morphogenesis. **K.N. Carroll, T.A. Scully, E.S. Mateer, Y. Cheng, M. Dzirlo-Ayvaz, K.G. Anitole-Misleh, K.M. Brown.** Dept. Biological Sciences, George Washington Univ., Washington, DC 20052.
- 182 B109 Hydra matrix metalloproteinases are involved in tissue dynamics, patterning process, and morphogenesis. **X. Zhang, R. Aufschnaiter, L. Zhang, M.P. Sarras, Jr.** Dept. of Anatomy and Cell Biology, University of Kansas Medical Center, Kansas City, Kansas 66160, USA.; Zoological Institute and Center of Molecular Biosciences, University of Innsbruck, Innsbruck, Austria.; Dept. of Cell Biology and Anatomy, Rosalind Franklin Univ of Medicine and Science, N. Chicago, IL, USA.
- Cell-Cell Signaling**
- 183 B110 The effect of Notch signaling on neurotransmitter phenotype specification in *Xenopus*. **M.S. Harper, S. Byers, M.S. Saha.** Dept. of Biol., College of William and Mary, Williamsburg, VA, USA.
- 184 B111 Decoding the in vivo Notch targetome. **C. Morgenstern, D. Ish-Horowicz.** Developmental Genetics Laboratory, Cancer Research UK London Research Institute, London, UK.
- 185 B112 Fgf signaling during cerebellar morphogenesis. **Y. Yaguchi, T. Yu, M. Gait, I. Mason, M. Basson.** Department of Craniofacial Development, King's College London, UK; MRC Centre for Developmental Neurobiology, King's College London, UK.
- 186 B113 FGF Signaling during embryo development regulates ciliogenesis in diverse epithelia. **J.M. Neugebauer, J.D. Amack, H. Yost.** Dept. Neuro and Anatomy, University of Utah, Salt Lake City, UT; Dept. of Cell and Dev. Biol., SUNY Upstate Medical University, Syracuse, NY.
- 187 B114 Withdrawn

188 B115 Endothelial signals regulate hepatocyte apico-basal polarization in zebrafish. **T.F. Sakaguchi, K.C. Sadler, C. Crosnier, D.Y. Stainier**. University of California, San Francisco, CA; Mount Sinai School of Medicine, NY; Cancer Research, London, UK.

189 B116 Cell-cell interactions mediate trigeminal ganglion formation and require Robo2-Slit1 signaling. **C.E. Shiau, P.Y. Lwigale, M. Bronner-Fraser**. Division of Biology MC 139-74, California Institute of Technology, Pasadena, CA 91125, USA.

190 B117 Sprinter/Wntless is an escort factor for Wg deployment. **E.M. Selva, A. Harmon, Y. Sharma**. Dept. of Biological Sciences, University of Delaware, Newark, DE 19716.

191 B118 Examining the role of the *C. elegans* uterine-vulval 1 (uv1) cells in egg-laying function. **L. Liu, L. Huang, W. Hanna-Rose**. Dept. Biochemistry and Molecular Biology, The Pennsylvania State University, University Park, PA.

Intracellular Signaling Pathways

192 B119 Inca: a novel regulator of cytoarchitecture and gene expression in vertebrate development. **T.D. Sargent, T. Luo, Y. Xu**. Laboratory of Molecular Genetics, NICHD, NIH, Bethesda MD, USA.

193 B120 Fast1 Functions as a Transcriptional Switch for Nodal Signaling in *Xenopus* Mesodermal Development. **A. Steiner*, C. Reid*, S. Yaklichkin, Q. Lu, S. Wang, M. Hennessy, D.S. Kessler**. Dept. of Cell & Developmental Biology, Univ of Pennsylvania, Philadelphia, PA, USA.

194 B121 Wnt8 signals through HIPK2 to relieve TCF3-mediated transcriptional repression. **H. Hikasa, K. Itoh, S.Y. Sokol**. Dept. of Dev. & Regenerative Biol. MSSM, New York, NY, USA.

195 B122 Role of xSyndecan4 in non-canonical Wnt signaling. **L. Carvalho, R. Muñoz, N. Escobedo, J. Larraín**. FONDAPE Biomedicine. Facultad de Ciencias Biológicas, P. Universidad Católica de Chile, Chile.

196 B123 A bimodal modulator in canonical Wnt signal transduction. **K. Tamai, H. Iioka, S. Doerner**. Department of Genetics, Case Western Reserve University, Cleveland, OH, USA.

197 B124 A role of Diversin subcellular localization in modulating Wnt signaling. **K. Itoh, S.Y. Sokol**. Department of Developmental and Regenerative Biology, Mount Sinai School of Medicine, New York, NY 10029, USA.

198 B125 Cardiomyocyte-specific loss of neurofibromin promotes cardiac hypertrophy and dysfunction through activation of the fetal gene program. **J. Xu, F.A. Ismat, T. Wang, M. Lu, J.A. Epstein**. Dept. of Cell & Dev. Biol., Univ. of Pennsylvania SOM, Philadelphia, PA; Div. of Cardiology, Children's Hosp. of Philadelphia, Philadelphia, PA.

199 B126 Nf1 is required for early murine lens development. **C. Carbe**. Department of Medical and Molecular Genetics, Indiana University School of Medicine, Indianapolis, IN.

200 B127 MAPK signaling during vasculature development in the mouse retina. **J.L. Bromberg-White, E. Boguslawski, N.S. Duesbery**. Laboratory of Cancer and Developmental Cell Biology, Van Andel Research Institute, Grand Rapids, MI, USA.

201 B128 A Role for TULP3 in Mouse Hedgehog Signaling and Neural Patterning. **R.A. Norman, A. Ikeda, J.T. Eggenschwiler**. Dept of Molecular Biology, Princeton Univ, Princeton, NJ, USA; Laboratory of Genetics, Univ. of Wisconsin-Madison, WI, USA.

- 202 B129 Intraflagellar transport protein 122 is a novel antagonist of the murine Hedgehog signaling pathway. **J. Qin, Y. Lin, H. Ko.** Department of Molecular Biology, Princeton University. Princeton, NJ 08544.
- 203 B130 Expression of EGF-Responsive ERK5 in Embryonic Mouse Submandibular Glands. **M. Kashimata, N. Koyama, T. Hayashi, E.W. Gresik.** Dept. of Pharmacology, Asahi Univ., Sch. of Dent., Gifu, Japan; Dept. of Cell Biology & Anatomy, CUNY, Medical Sch., NY, NY, USA.
- 204 B131 Absolute quantitation of mRNAs for ErbB receptors and their ligands in fetal mouse submandibular glands by a real time RT-PCR. **T. Hayashi, N. Koyama, M. Kashimata, E.W. Gresik.** Dept. of Pharmacology, Asahi Univ. Sch. of Dent., Gifu, Japan; Dept. of Cell Biology & Anatomy, CUNY, Medical Sch., NY, NY, USA.
- 205 B132 Dynamic control of Sanpodo protein targeting regulates Notch signaling following asymmetric cell division in *Drosophila*. **D. Zitserman, X. Tong, F. Roegiers.** Epigenetics and Progenitor Cells Program, Fox Chase Cancer Center, Philadelphia, PA, USA.
- 206 B133 Numb binding to a conserved motif of Sanpodo regulates its endocytosis in Notch-mediated cell fate decisions in *Drosophila*. **X. Tong, D. Zitserman, F. Roegiers.** Epigenetics and Progenitor Cell Program, Fox Chase Cancer Center, Philadelphia, PA, USA.
- 207 B134 *Drosophila* Rabconnectin3 alpha and beta regulate trafficking and Notch signaling in the follicle cells. **Y. Yan, N. Deneff, T. Schupbach.** Dept. Molecular Biology, Princeton University; HHMI.
- 208 B135 Identification and characterization of phosphatases that regulate TGF β signaling in *C. elegans*. **S. Xiong, C. Savage-Dunn.** Biology Department, Queens College and Biochemistry Program, the Graduate Center, CUNY, Flushing, NY, 11367.
- 209 B136 The role of bec-1 in *C. elegans* autophagic and endocytic pathways. **A.S. Ruck, L. Nuñez, A. Meléndez.** Dept. of Biology, Queens College, Flushing, NY, USA.

Cell Fate Specification

- 210 B137 Linking cell polarity to competence during heart specification. **B. Davidson, D. Odam.** MCDB, University of Arizona, Tucson, AZ, USA.
- 211 B138 Vitamin overdose: vitamin B3 processing by PNC-1 regulates *C. elegans* organ development. **T.L. Vrablik, W. Hanna-Rose.** Biochem. & Mol. Biol., Penn State Univ., University Park, PA.
- 212 B139 An extrinsic cue regulates neuronal temporal identity in the *Drosophila* mushroom body. **E.C. Marin, B.A. Apenteng, J.W. Truman.** Dept. of Biology, University of Washington, Seattle, WA, USA; Neuroscience Program, University of Washington, Seattle, WA, USA; Janelia Farm Research Campus, Ashburn, VA, USA.
- 213 B140 *Drosophila* Apontic acts as a feedback inhibitor of JAK/STAT signaling and is required to limit an invasive cell population. **M. Starz-Gaiano, M. Melani, X. Wang, H. Meinhardt, D. Montell.** Johns Hopkins School of Medicine, Baltimore, MD, USA; Max-Planck-Institut für Entwicklungsbiologie, Tübingen, Germany.
- 214 B141 Sequential actions of Pax3 and Pax7 drive xanthophore development in zebrafish neural crest. **J.E. Minchin, S.M. Hughes.** Randall Division of Cell & Molecular Biophysics, King's College London, UK; MRC Centre for Developmental Neurobiology, King's College London, UK.

- 215 B142 The Zebrafish Mutants lpy and myx Exhibit Loss of Skeletogenic Cranial Neural Crest. **S.G. Cox, G.D. Crump**. Center for Stem Cell and Regenerative Medicine, University of Southern California, Los Angeles, CA, USA.
- 216 B143 Notch resolves mixed neural identities in the zebrafish epiphysis. **A. Quillien, E. Cau, P. Blader**. Centre de Biologie du Développement, Université Paul Sabatier, Toulouse, FRANCE.
- 217 B144 Notch signaling has differing effects on subpopulations of retinal progenitor cells in zebrafish retinal development. **A. Millet, J.M. Fadool**. Dept. of Biol. Sci., FSU, Tallahassee, FL.
- 218 B145 Lots-of-rods (lor) Regulates Photoreceptor Subtype Specification in Zebrafish. **J.M. Fadool, J.T. Gamse, K. Alvarez-Delfin, A.C. Morris**. Biological Science, Florida State University, Tallahassee, FL, USA; Biological Sciences, Vanderbilt University, Nashville, TN.
- 219 B146 Intra-endodermal interactions are required for pancreatic β -cell induction. **W. Chung, D.Y. Stainier**. Department of Biochemistry and Biophysics, University of California, San Francisco, San Francisco, CA 94158, USA.
- 220 B147 PAR-1 phosphorylates the ubiquitin ligase Mind bomb to repress Notch signaling and promote vertebrate neurogenesis. **S. Sokol, O. Ossipova, J. Ezan**. Dept of Developmental and Regenerative Biology, Mount Sinai School of Medicine, Box 1020, New York, NY 10029, USA.
- 221 B148 Characterization of calcium channel subunit expression in the developing *Xenopus laevis* nervous system. **L. Miller, B. Johnson, M.S. Saha**. Dept. of Dev. Biol., College of William and Mary, Williamsburg, VA, USA.
- 222 B149 A novel in vitro system of primary *Xenopus* ectodermal explants to determine the specific function of pan neural SoxB1 proteins. **T.C. Archer, E.M. Silva Casey**. Dept. of Biology, Georgetown Univ., Washington, DC, USA.
- 223 B150 Characterization of neurotransmitter phenotypes in the developing *Xenopus* retina. **R.F. Lowdon, M.S. Saha**. Dept. of Biol., College of William and Mary, Williamsburg, VA, 23185.
- 224 B151 Otic placode specification in *Xenopus* by hindbrain-derived signals. **B. Park, J. Saint-Jeannet**. Dept. of Anim. Biol., Vet. Med., Univ. of Pennsylvania, Philadelphia, PA, USA.
- 225 B152 Fgf8a and Wnt8 are acting in the same pathway to specify the neural crest in *Xenopus*. **C. Hong, B. Park, J. Saint-Jeannet**. Dept. of Biol. Sci., Daegu Univ., Gyeongsan, Gyeonbuk, Korea; Dept. of Anim. Biol., Sch. of Vet. Med., Univ. of Pennsylvania, Philadelphia, PA, USA.
- 226 B153 Developmental potential of migrating neural crest cells. **V.M. Lee**. Dept. of Pediatrics, Med. Coll. of Wis., Milwaukee, WI.
- 227 B154 Genome wide transcription profile of migrating neural crest cells. **X. Gao, H. Meng, V.M. Lee**. Dept. of Pediatrics, Med Coll Wis., Milwaukee, WI 53226.
- 228 B155 Intrinsic features of the caudal-most neural crest cells in chick embryo. **L. Osorio, M. Teillet, M. Catala**. LBD, UPMC Univ Paris 06, Paris, France; LBD, CNRS UMR7622, Paris, France; ICVS ECS, University of Minho, Braga, Portugal.
- 229 B156 FGF, Notch, and Wnt signaling regulate ophthalmic trigeminal placode cell fate determination and differentiation. **R.N. Lassiter, S.B. Reynolds, M.R. Stark**. Department of Physiology & Developmental Biology, Brigham Young University, Provo, UT.

- 230 B157 PDGF signaling is critical for trigeminal placode formation. **K.L. McCabe, M. Bronner-Fraser**. Div. of Biol. California Institute of Technology, Pasadena, CA, USA.
- 231 B158 Sphingosine-1-phosphate signaling during sensory gangliogenesis. **H. Meng, X. Gao, V.M. Lee**. Dept. of Pediatrics, Med. Coll. of Wis., Milwaukee, WI.
- 232 B159 Molecular networks controlling the specification of sensory organ progenitors. **A. Streit, N. Christophorou, L. Lleras**. Dept. Craniofacial Development, King's College London, London, UK.
- 233 B160 Sox2 as a prosensory and proneural gene in the developing mouse cochlea. **C. Puligilla, A. Dabdoub, K.S. Cheah, L.H. Pevny, M.W. Kelley**. NIDCD/NIH, MD; Univ. of Hong Kong; UNC, NC.
- 234 B161 Hedgehog signaling regulates mammalian sensory cell formation and auditory function. **E. Carroll Driver, M.W. Kelley**. Sect. on Dev. Neuroscience, NIDCD, NIH, Bethesda, Maryland.
- 235 B162 miR-34a modulates neural progenitor cell differentiation. **S.K. Fineberg, L.L. Ghosh, B.J. He, S.Q. Harper, B.L. Davidson**. Molecular Physiology and Biophysics; Medical Scientist Training Program; Iowa Biosciences Advantage; Children's Hospital, Ohio State University; Department of Internal Medicine.
- 236 B163 Lin28 controls cell fate in mammalian neurogenesis. **E. Balzer, E.G. Moss**. Dept. of Mol. Biol. UMDNJ, Stratford, NJ, USA.
- 237 B164 An essential Role for Frizzled5 in neuronal survival in the parafascicular nucleus of the thalamus. **C. Liu, Y. Wang, P.M. Smallwood, J. Nathans**. Department of Molecular Biology and Genetics, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA; Hughes Medical Institute, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA.
- 238 B165 *Pitx2* is critical for the survival and specification of extraocular muscles. **E.L. Amanda, M. Qian, P.J. Gage**. Cell & Developmental Biology; Ophthalmology & Visual Science, University of Michigan, Ann Arbor, MI, USA.
- 239 B166 Evidence for functional conservation of myogenic regulatory factors: Electric fish MyoD and myogenin induce mammalian skeletal muscle differentiation. **R. Güth, H. Kim, G. Unguez**. Dept. of Biology, New Mexico State University, Las Cruces, NM, USA.
- 240 B167 Lineage mapping and genetic cell ablation of post-migratory cardiac neural crest cells. **S.J. Conway, P. Snider**. Herman B Wells Center for Pediatric Research, Indiana University School of Medicine, IN 46202.
- 241 B168 Notch2 controlled molecular mechanisms underlying secondary heart field differentiation and proliferation. **P.A. Varadkar, M. Kraman, B. McCright**. Division of Cellular and Gene Therapies, FDA, Bethesda MD.
- 242 B169 Constitutive activation of β -catenin signaling in embryonic surface epithelium results in global acquisition of hair follicle fate. **Y. Zhang, T. Andl, F. Liu, S.H. Yang, M.M. Taketo, A.A. Dlugosz, S.E. Millar**. Departments of Dermatology and Cell and Developmental Biology, University of Pennsylvania, Philadelphia PA 19104, USA.
- 243 B170 Distinct sequential cell behaviours direct primitive endoderm formation in the mouse blastocyst. **A.E. Piliszek, B. Plusa, S. Frankenberg, J. Artus, A. Hadjantonakis**. Developmental Biology Program, Sloan-Kettering Institute, New York, NY, USA; Faculty of Life Sciences, Manchester University, Manchester,

UK; Department of Experimental Embryology, Institute of Genetics and Animal Breeding, Polish Academy of Sciences, Jas.

244 B171 NOTCH1 is a stronger astrocytic stimulus than Leukemia Inhibitory Factor for rat neural stem cells. **N.S. Rodríguez, D. Escalante-Alcalde, I. Velasco.** Dept. de Neurociencias, Instituto de Fisiología Celular, UNAM, México DF, Mexico.

Cell Motility and Guidance

245 B172 The *C. elegans* Flamingo homologue FMI-1 is involved in pioneer-mediated axon guidance in the ventral nerve cord. **A. Steimel, I. Wacker, H. Hutter.** Department of Biological Sciences, Simon Fraser University, Burnaby BC, Canada; MPI for Medical Research, Heidelberg, Germany.

246 B173 The role of PDGF-AA-fibronectin interactions in the directed migration of mesendoderm cells during gastrulation. **E.M. Smith, M. Mitsi, M.A. Nugent, K. Symes.** Department of Biochemistry, Boston University School of Medicine, Boston, MA, USA.

247 B174 Regulation of Twist Function in Developmental and Pathological Epithelial-Mesenchymal Transitions. **R.M. Lander, C. LaBonne.** IBI-S, Dept. of Biochemistry, Molecular Biology and Cell Biology, Northwestern University, Evanston, IL, USA.

248 B175 Myosin-X is required for proper behavior of Neural Crest Cells in *Xenopus laevis*. **Y. Hwang, T. Luo, Y. Xu, T.D. Sargent.** Laboratory of Molecular Genetics, NICHD, NIH, Bethesda, MD, USA.

249 B176 *Xenopus* sonic hedgehog is involved in retinal axon guidance. **A.R. Morris, L. Carlson, M. Mansh, H. Kinsman.** Department of Biology, Haverford College, Haverford, PA, USA; Neuroscience Program, University of Pennsylvania, Philadelphia, PA, USA.

250 B177 The GSK-3 β and α -catenin binding sites of β -catenin exert opposing effects on directional persistence and filopodial protrusions of optic axons in situ. **A. Shah, A. Pelzer, M. Southard, T. Elul.** College of Osteopathic Medicine, Touro University-California; Dept. of Basic Sciences.

251 B178 Interactions between [beta]-Catenin and Fgf signaling coordinate directional migration of groups of cells. **A. Aman, T. Piotrowski.** University of Utah, Dept. of Neurobiology and Anatomy, Salt Lake City, UT 84132, USA.

252 B179 Characterization of genes selectively expressed in the developing zebrafish nervous system. **D.R. Hammond, A. Schmoldt, A.J. Udvardia.** Department of Biological Sciences, UW- Milwaukee, Milwaukee, WI, USA; Great Lakes WATER Institute, UW-Milwaukee, Milwaukee, WI, USA.

253 B180 Discovery of selectively expressed genes in the developing vertebrate nervous system. **F. Jennifer, H.R. Dena, F. Jennifer, U.J. Ava.** Dept. of Bio. Sci., UW-Milwaukee, Milwaukee, WI, USA; Great Lakes WATER Institute, UW-Milwaukee, Milwaukee, WI, USA.

254 B181 cMet signaling functions during zebrafish hindbrain development. **G.E. Elsen, L.Y. Choi, V.E. Prince, R.K. Ho.** Committee on Neurobiology, University of Chicago, Chicago, IL;; Committee on Developmental Biology, University of Chicago, Chicago, IL;; Department of Organismal Biology and Anatomy, University of Chicago, Chicago, IL;.

255 B182 Semaphorin3A regulates neural crest migration during ocular development. **P.Y. Lwigale, M. Bronner-Fraser.** Division of Biology, California Institute of Technology, Pasadena, CA. USA; Dept. of Biochem. and Cell Biol., Rice University, Houston, TX. USA.

256 B183 Neuropilin Receptors Regulate Vertebrate Peripheral Nervous System Segmentation. **J. Roffers-Agarwal, L.S. Gammill**. Department of Genetics, Cell Biology and Development, University of Minnesota. Minneapolis, MN 55455.

257 B184 Role of frizzled 3, a Planar Cell Polarity gene, in sympathetic nervous system development. **A.G. Richmond, D. Chieco, R. Kuruvilla**. Johns Hopkins University Baltimore, MD.

258 B185 Parietal Endoderm Migration is Directed by the Planar Cell Polarity Pathway. **K. LaMonica, M. Bass, L. Grabel**. Dept. of Biology, Wesleyan University, Middletown, CT.

259 B186 Dynamics of collective cell migration under cell density heterogeneity. **Y. Chen, G. Liu, L. I.** Department of Physics and Institute of Biophysics, National Central University, Jhong-Li, Taiwan 32001, Republic of China.

260 B187 Movers and Shakers: Timelapse Analysis of Satellite Cell Migration. **A. Siegel, K. Atchison, G.E. Davis, D. Cornelison**. Div. of Biological Sciences, Univ. of Missouri, Columbia, MO, USA; Dept. of Medical Pharmacology & Physiology.

Cell Proliferation

L4 B188 Canonical Wnt signaling regulates cell cycle progression of retinal progenitors in Medaka. **A. Sanchez, A. Leal, J. Mullor**. Dept. Stem Cell Differentiation Centro de Investigación Príncipe Felipe. 46012 Valencia, Spain.

262 B189 Maternal-effect brambleberry functions during cleavage stage to maintain nuclear integrity. **E.W. Abrams, F. Marlow, L. Kapp, T. Gupta, M. Mullins**. University of Pennsylvania, Depart. of Cell and Developmental Biology, Philadelphia, PA.

263 B190 Developmental Regulation of Cell Division Mechanisms in a Vertebrate Embryo. **E. Kieserman, M. Glotzer, J.B. Wallingford**. Dept. of Mol. Cell and Dev Biol., ICMB. Univ. of Texas at Austin, Austin, TX, USA; Dept. of Mol. Genetics & Cell Biol. Univ. of Chicago. Chicago, IL, USA.

264 B191 Differentiation Of Trophoblast Stem Cells Into Giant Cells Is Triggered By p57 Inhibition Of CDK1 Activity. **M.J. Kohn, Z. Ullah, R. Yagi, L. Vassilev, M. DePamphilis**. Program in Genomics of Development, NICHD, NIH, Bethesda, MD; Dept of Discovery Oncology, Roche Research Center, Nutley, NJ.

265 B192 Function of a key Cell Cycle regulator, the CDC25B phosphatase, during Neurogenesis. **E. Peco, V. Sabado, F. Medevielle, C. Dozier, B. Ducommun, F. Pituello**. Centre de Biologie du Développement, Toulouse, FRANCE; LBCMCP, Toulouse, FRANCE; Dept. of Craniofacial Dev., King's college, London, UK.

266 B193 Alterations in HGF/SF-Met signaling in the developing forebrain modulate neuronal proliferation and migration. **G.J. Martins, C. Plachez, E.M. Powell**. Prog. Neurosci; Dept. Anat Neurobiol; Dept. Psychiatry, Univ. Maryland, Baltimore, USA.

267 B194 Nonmuscle Myosin II-B Plays Important Roles in Mouse Heart Development. **X. Ma, R.S. Adelstein**. LMC/NHLBI, Bethesda, MD, 20892-1762.

268 B195 Understanding the impact of γ -Secretase on cell death in Drosophila. **H. Chung, E. Atkinson, B. Mercer, C. Kay, E. Cooper**. Dept. of Biology, University of West Florida; Environmental Protection Agency in Gulf Breeze.

Germ Cells and Gametogenesis

- 269 B196 LSD1 Contributes to Germline Immortality in *C. elegans* by Reprogramming Epigenetic Memory. **D.J. Katz, T. Edwards, W.G. Kelly**. Dept. of Biology, Emory University, Atlanta, GA, USA.
- 270 B197 The intriguing interaction of Dicer (DCR-1) with GLH-1, a P granule component in *Caenorhabditis elegans*. **E.L. Racen, T.J. McEwen, K.L. Bennett**. Univ. of Missouri, Columbia, MO.
- 271 B198 A dominant suppressor of the *fog-1(q253ts)* allele maps to *C. elegans LGII*. **K.R. Douglas, A.C. Caravelli, J.J. Lyphout**. Biology Department, Augustana College, Rock Island, IL, USA.
- 272 B199 Regulation of the actin cytoskeleton during *Drosophila* oogenesis by Ena and Capping Protein. **J. Gates, J.P. Mahaffey, S. Beckwith, N. Kaplan, M. Peifer**. Biol. Dept., Bucknell Univ, Lewisburg, PA; Biol. Dept., UNC-CH, Chapel Hill, NC.
- 273 B200 Myosin Phosphatase Plays a Role in Incomplete Cytokinesis. **C. Tan, S. Ong**. Bond Life Sciences Center, Div. of Biol. Sciences, Univ. of Missouri, MO, USA.
- 274 B201 Zfh-1 controls somatic stem cell self-renewal in the *Drosophila* testis, and non-autonomously influences germline stem cell self-renewal. **J.L. Leatherman, S. DiNardo**. Dept. of Cell and Developmental Biology, University of Pennsylvania School of Medicine.
- 275 B202 A cell-intrinsic role for IGF signaling in zebrafish primordial germ cell migration. **A.W. Wood, X. Sang, M.S. Curran**. Vincent Center for Reproductive Biology, Massachusetts General Hospital, Boston, MA; Harvard Stem Cell Institute, Boston, MA.
- 276 B203 magellan functions during oogenesis to establish the animal-vegetal axis of the zebrafish egg. **T. Gupta, F. Marlow, W. Mei, M. Mullins**. Univ. of Pennsylvania, Philadelphia, PA, 19104.
- 277 B204 Ovarian Development in Mice Requires GATA4/FOG2 Transcriptional Complex. **S.G. Tevosian, F.O. Smagulova, D. Maatouk, L.L. Leach, B. Capel, N.L. Manuylov**. Department of Genetics, Dartmouth Medical School, Hanover, NH 03755; Department of Cell Biology, Duke University Medical Center, Durham, NC 27710.
- 278 B205 CDC14A and CDC14B regulate meiotic progression in mouse oocytes. **K. Schindler, R.M. Schultz**. University of Pennsylvania, Department of Biology, Philadelphia, PA 19104.
- 279 B206 Hsp90a regulate meiotic G2/M transition in mouse oocyte. **A.A. METCHAT, M.M. Åkerfelt, C.C. Bierkamp, V.V. Delsinne, L.L. Sistonen, H.H. Alexandre, E.E. Christians**. Centre de Biologie du Développement, UMR5547 CNRS-UPS, Toulouse, France; University of Turku, Åbo Akademi University, 20520 Turku, Finland; Université de Mons-Hainaut, Faculté de Médecine-Pharmacie, Mons, Belgium.

Fertilization

- 280 B207 Live Imaging Analysis of Mouse Sperm Acrosomal Exocytosis. **M.G. Buffone, E. Rodriguez-Miranda, G.L. Gerton**. Ctr. Res. Reprod. Woemn's Hlth, Univ. Penn. Med Ctr., Philadelphia, PA; Dept. OBGYN, Univ. Penn. Med Ctr., Philadelphia, PA.
- 281 B208 TSSK6, a member of the testis-specific serine kinase family, is required for sperm-egg fusion in the mouse. **J. Sosnik, P. Miranda, N. Spiridonov, S. Yoon, R.A. Fissore, G. Johnson, P.E. Visconti**. University of Massachusetts, Amherst, MA; FDA, Bethesda, MD.

282 B209 Sorbitol Can Fuel Mouse Sperm Motility And Protein Tyrosine Phosphorylation Via Sorbitol Dehydrogenase. **W. Cao, H.K. Aghajanian, L.A. Haig-Ladewig, G.L. Gerton.** Center for Research on Reproduction and Women's Health, University of Pennsylvania Medical Center, Philadelphia, PA, USA; Department of Pathology and Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, USA.

Stem Cells and Tissue Regeneration

283 B210 Neural Stem Cell Erythropoietin Receptor Expression During Human Fetal Brain Development. **H. Hao, J. Zhao, K. Barami, L. Morawa.** Dept. Orthopaedic Sug. Wayne State University, Detroit, MI 48823; Neuroscience Ctr., Memorial Hosp. Jacksonville, FL.

284 B211 Frozen human fibroblast cultures of varying ages contain numerous multipotent cells capable of in vitro differentiation into cells of all three germ layers. **L.J. Sciorra, A. Arriola, B. Aryal, B. Bista, J.M. Cipolla, K. Gryte, S. Iparraguirre, J. Wilmanski.** St. Peter's College, Jersey City, NJ.

285 B212 Withdrawn

286 B213 Interactors of Sox2 in embryonic stem cells. **P. Gontan, T. Güttler, J. Demmers, F. Grosveld, D. Tibboel, M. Fornerod, D. Görlich, R. Poot, R. Rottier.** Dept. Cell Biology, Erasmus MC, Rotterdam, The Netherlands; Dept. of Pediatric Surgery, Erasmus MC, Rotterdam, The Netherlands; Max-Planck-Institut für Biophysikalische Chemie, Göttingen, Germany; Dept. of Tumor Biology, NKI, Amsterdam, The Netherlands; ;.

287 B214 The exon junction complex component, Magoh, is required for neural stem cell maintenance. **D.L. Silver, D. Watkins-Chow, W.J. Pavan.** GDRB, NHGRI, Bethesda, MD.

288 B215 Foxd3 is required for maintenance of multipotent neural crest progenitors. **N.A. Mundell, A.Y. Frist, P.A. Labosky.** Department of Pharmacology; Department of Cell and Developmental Biology, Vanderbilt University, Nashville, TN, USA.

289 B216 Nuclear interaction of homeodomain protein ZHX2 and ephrin-B1 in neural progenitor maintenance. **C. Wu, J. Wang, R. Qiu, K. Murai, H. Zhang, Q. Lu.** Division of Neurosciences, Beckman Research Institute of the City of Hope, 1500 East Duarte Road, Duarte, CA 91010; City of Hope Graduate School of Biological Sciences.

290 B217 Differential gene expression profile in comparative microarray between olfactory ensheathing cells and striatal embryonic stem cell. **D. Ortuno, N.M. Torres-Ruiz, A.E. Rojas-Mayorquín, C. Beas, G. Gudiño-Cabrera.** Dept. of Cell. Mol. Biol. Univ de Guadalajara, Jalisco, MEX.

291 B218 Pleiotrophic roles for syndecan-4 in muscle regeneration. **K.L. Capkovic, D. Cornelison.** Dept. of Biol. Sci., Univ. of Missouri, Columbia, MO, USA.

292 B219 Role of Ldb1 in tissue homeostasis of the adult mouse. **I. Dey-Guha, M. Mukhopadhyay, H. Westphal.** LMGD, NICHD, NIH, Bethesda, MD, USA.

293 B220 Islet1 and its cofactor LDB1 express in the mouse intestinal epithelium. **E. Makarev, H. Westphal.** Laboratory of Mammalian Genes and Development, NIH, Bethesda, MD, USA.

294 B221 WNT/ β -catenin signaling maintains regenerating adult oral appendage organs and promotes stem cell expansion and de novo organ development. **F. Liu, T. Andl, Y. Zhang, S. Millar.** Depts. of Dermatology and Cell and Developmental Biology, University of Pennsylvania, Philadelphia PA, USA.

- 295 B222 Wnt/ β signaling regulates expansion but not survival of mammary stem cells. **X. Wu, M.M. Yunta, E.E. Chu, T. Andl, N.M. Gallant, S. Piccolo, A. Glick, S.E. Millar.** Dept. of Derm., Univ. of Pennsylvania, Philadelphia, PA, USA; Dept. of Histo., Microbio., and Medical Biotech, Univ. of Padua, Padua, Italy; Dept. of Veterinary & Biomedical Sciences, Pennsylvania State Univ., University Park, PA, USA;
- 296 B223 Dicer is required for maintenance of hair follicle stem cells in adult skin. **M. Teta, A. Thomas, T. Okegbe, E.P. Murchison, A. Nagy, G.J. Hannon, S.E. Millar.** Departments of Dermatology and cell and Developmental Biology, University of Pennsylvania School of Medicine, Philadelphia PA 19104, USA; Cold Spring Harbor Laboratory, Cold Spring Harbor, NY 11724; Mount Sinai Hospital, Toronto, Ontario, Canada M5G 1X5;
- 297 B224 Hedgehog-responding stem cells regenerate the anagen hair follicle. **I. Brownell, A. Patel, A.L. Joyner.** Dev. Bio. Prog., Memorial Sloan-Kettering Cancer Center, New York, NY.; Dermatology Service, Memorial Sloan-Kettering Cancer Center, New York, NY.
- 298 B225 The dermal papilla regulates the activity of pluri-potent follicular stem cells and the differentiation of their progeny to direct morphogenesis and regeneration of the hair. **B.A. Morgan, D. Enshell-Seijffers.** Cutaneous Biology Research Center, Harvard Medical School and Massachusetts General Hospital, Charlestown, MA 02129 USA.
- 299 B226 Pax6 is required for neuronal progenitor cell proliferation during cone cell regeneration. **R. Thummel, J.M. Enright, S.C. Kassen, J.E. Montgomery, D.R. Hyde.** Department of Biological Sciences, University of Notre Dame, Notre Dame IN 46556.
- 300 B227 Live cell imaging of the zebrafish dermomyotome. **B. Dobbs-McAuliffe, J. Montgomery, D. Hyde, S. Devoto.** Biomolecular Science Dept., Central Connecticut State Univ., Ct.; Dept. of Biological Science, Univ. of Notre Dame, In.; Biology Dept., Wesleyan Univ., Ct.
- 301 B228 Culture of primary myogenic cells derived from adult muscle and electric organ of the gymnotiform *S. macrurus*. **E. Archer, N. Escobedo, H. Kim, J. Gabillard, G.A. Unguez.** Dept. Biology, New Mexico State University, Las Cruces, NM; Institut National de la Recherche Agronomique, INRA-SCRIBE, Rennes, France.
- 302 B229 Identifying the precursor zone of muscle satellite cells in *Xenopus laevis* embryos. **Y. Chen, J. Slack.** Stem cell Institute, University of Minnesota, Minneapolis, Minnesota, USA.
- 303 B230 Requirement for Wnt and FGF signaling in *Xenopus* tadpole tail regeneration. **G. Lin, J. Slack.** Stem Cell Institute, University of Minnesota, 2001 6th Street SE, Minneapolis, MN 55455, USA.
- 304 B231 Identification and Gene Expression Analysis of Successfully Regenerating CNS Neurons in the Hindbrain of the *Xenopus laevis* Tadpole. **K.M. Gibbs, B.G. Szaro.** Department of Biological Sciences, State University of New York, Albany, NY, USA.
- 305 B232 Meningeal Organization and Injury Response in Amphibian Spinal Cord Regeneration. **D.A. Sarria, H.V. Nguyen, M.W. Egar, E.A. Chernoff.** Dept. of Biol., Indiana Univ - Purdue Univ Indianapolis, IN, USA.
- 306 B233 Gene expression of axolotl limb regeneration mutant short toes. **K. Sato, E.A. Chernoff.** Indiana University Center for Regenerative Biology and Medicine, Dept. of Biology, Indiana Univ.-Purdue Univ. Indianapolis.
- 307 B234 Expression of Matrix Metalloproteinases (MMPs) during Axolotl Limb Regeneration. **N. Santosh, N. Al-Shibani, N. Labban, N. Rao, B. Li, L.J. Windsor, F. Song, D. Stocum.** Dept of Oral

Biology, Indiana University School of Dentistry, Indianapolis, IN; Dept of Biology, Indiana University School of Science, Indianapolis, IN.

308 B235 Functional Genomics of Planarian Regeneration. **J.M. Stary, P.A. Newmark.** Department of Cell & Developmental Biology, Neuroscience Program, Univ of Illinois, Urbana, IL, USA.

309 B236 Intestinal renewal and regeneration in the planarian *Schmidtea mediterranea*. **D.J. Forsthoefel, D.J. Escobar, J.M. Stary, P.A. Newmark.** Dept. of Cell and Developmental Biology; Neuroscience Program, University of Illinois at Urbana-Champaign, Urbana, IL, USA.

310 B237 RNAi-based analysis of flatworm stem cell and germ line genes. **D. Pfister, K. De Mulder, G. Kualess, K. Sekii, P. Ladurner.** Institute of Zoology, University of Innsbruck, Austria; Department of Biology, University of Ghent, Belgium; Evolutionary Biology, Zoological Institute, University of Basel, Switzerland.

Molecular Medicine and Development

311 B238 Mesenchymal b-catenin regulates Tbx1 expression and causes DiGeorge-like phenotypes. **S. Huh, D.M. Ornitz.** Dept. of Dev. Biol. Washington University Sch. of Med. St Louis, MO, USA.

312 B239 The effect of embryo biopsy on gene expression and development in the preimplantation mouse embryo. **F.E. Duncan, P. Stein, R.M. Schultz.** U of Penn, Biology Dept., Philadelphia, PA.

313 B240 Role of MESD in WNT Signaling and Lipoprotein Metabolism. **J.K. Chang, J. Hsieh, B.C. Holdener.** Dept. of Biochem. and Cell Biology, Stony Brook University, Stony Brook, NY 11794-5215.

314 B241 A Zebrafish Genetic Model of Spinal Muscular Atrophy and Functional Analysis of the Smn-Binding Protein, Gemin2. **M.L. McWhorter, K. Boon, S. Xiao, J. Mullenberg, T. Donn, C. Moens, C.E. Beattie.** Biology Department, Wittenberg University, Springfield, OH, USA; Center for Molecular Neurobiology, Department of Neuroscience, The Ohio State University, Columbus, OH, USA; Howard Hughes Medical Institute, Division of Basic Science, Fred Hutchinson Cance.

315 B242 Discovery and Characterization of Novel Synuclein Genes in Zebrafish. **Z. Sun, A.D. Gitler.** Department of Cell and Developmental Biology, University of Pennsylvania School of Medicine, Philadelphia, PA, USA.

316 B243 Seeking the biochemical basis of Type III 3-methylglutaconic aciduria through zebrafish models. **W. Pei, I. Bernardini, C. Wassif, F. Porter, Y. Anikster, M. Huizing, B. Feldman.** National Institute of Health, Bethesda, MD, USA; Sheba Medical Centre, Sackle Medical School, Tel Aviv University, Tel-Hashomer, Israel.

317 B244 Imaging of Intestinal Lipid Absorption and Processing in a Live Zebrafish. **J. Walters, S. Farber.** Department of Embryology, Carnegie Institution of Washington.

318 B245 Valproic acid, an HDAC inhibitor, disrupts primitive hematopoiesis in *Xenopus laevis*. **R. Shah, P. Klein.** School of Medicine, University of Pennsylvania, Philadelphia, PA 19104

Poster Session II

Houston Hall: Hall of Flags, Bodek Lounge, Class of 49

Poster Session II themes: Functional Genomics, Gene Regulation, Early Embryo Patterning, Patterning and Transcription Factors, Organogenesis, Late Abstracts

Viewing: Mon, July 28, 12:30-2 PM, 8-11 PM; Tue, July 29, 12:30-2 PM

Author presentation: Mon, July 28

Odd board numbers – 8-9:30 PM

Even board numbers – 9:30-11 PM

Abstract Program Number in Italics

B# = Poster Board Numbers

Functional Genomics,

319 B1 Computational analysis of shape characteristics of gene expression patterns in the embryo. **J. Christiansen, P. Stevenson, S. Venkataraman, L. Richardson, Y. Yang, N. Burton, D. Davidson, R. Baldock.** MRC Human Genetics Unit, Edinburgh, UK.

320 B2 The Gene Expression Database (GXD): A Resource for Developmental Biologists. **C.M. Smith, J.H. Finger, T.F. Hayamizu, I.J. McCright, J.T. Eppig, J.A. Kadin, J.E. Richardson, M. Ringwald.** Mouse Genome Informatics, The Jackson Laboratory, Bar Harbor, ME, USA.

321 B3 Homeodomain Proteins in Mice and Plants: What We Know and What We Don't. **T.Z. Berardini, D.P. Hill, S.Y. Rhee, J.A. Blake.** The Arabidopsis Information Resource, Carnegie Institution for Science, Stanford, CA, USA; The Gene Ontology Consortium, Planet Earth; Mouse Genome Informatics, The Jackson Laboratory, Bar Harbor, ME, USA.

Gene Regulation

322 B4 Toward identification of the factors which turn on the master switch LEAFY for flower formation. **A. Yamaguchi, D. Wagner.** Dept. of Biol. Univ. of Pennsylvania, Philadelphia, PA, USA.

323 B5 LMI2, a MYB transcription factor involved in the vegetative to reproductive transition in *Arabidopsis thaliana*. **J. Pastore, N. Chavdaroff, D. Wagner.** Dept. of Biology, University of Pennsylvania, Philadelphia, PA, USA.

324 B6 *Arabidopsis* Actin Depolymerizing Factor5 functions in multicellular development and is a novel repressor of the CBF cold response transcription factors. **D.R. Ruzicka, M.K. Kandasamy, E.C. McKinney, R.B. Meagher.** Dept. of Genetics, University of Georgia, Athens, GA, USA.

325 B7 An analysis of aminopeptidase N genes in the sea urchin genome. **E. Ingersoll.** Department of Biology, Penn State Abington, Abington, PA, USA.

326 B8 Quantitative RT-PCR Analysis of Dll-B misexpression in the ascidian chordate *Ciona intestinalis*. **M.D. Blanchette, F.W. Smith, M.A. Zompa, S.Q. Irvine.** Dept. of Biological Sciences, Univ. of Rhode Island, Kingston RI, USA; Current address: Dept. of Ecol. and Evol. Bio., Univ. of Connecticut, Storrs CT, USA.

327 B9 Regulators affecting miRNA function in the worm heterochronic pathway. **B. Vadla, K. Kemper, E.G. Moss.** Dept. of Mol. Biol. UMDNJ, Stratford, NJ, USA.

328 B10 HIM-8 and ZIM zinc-finger proteins globally affect transcription factor activity. **K. Zhou, H. Sun, W. Hanna-Rose.** Dept. of Biochem. and Mol. Biol. Pennsylvania State Univ., University Park, PA, USA.

329 B11 SMA-9/Schnurri function and its target genes. **J. Yin, L. Yu, C. Savage-Dunn.** Biology Department, Queens College at CUNY, Flushing, NY, USA.

330 B12 Regulation of collagen gene expression by the DBL-1/TGF- β signaling pathway. **E. Yzeiraj, J. Yin, C. Savage-Dunn.** Department of Biology, Queens College CUNY, Flushing, NY, USA.

- 331 B13 Discovery and functional analysis of shared regulatory elements in neuroblast enhancers. **T. Brody, A. Kuzin, M. Kundu, J. Ross, W. Odenwald.** Neural Cell-Fate Determinants Section, NINDS, NIH, Bethesda MD.
- 332 B14 Withdrawn
- 333 B15 Identifying Tissue Specific Alternative Splicing Events in Drosophila. **N. Sirohi, T. Rudolph, A. Nagengast.** Dept of Biology, Widener University, Chester, PA; Dept of Biochemistry, Widener University, Chester, PA; Dept of Chemistry, Widener University, Chester, PA.
- 334 B16 Identification of alternative splicing in genes that determine sexual dimorphism in *Stiphra* sp. **M. Miller, S. Madigosky, I. Vatnick, A. Nagengast.** Dept of Biology; Dept of Biochemistry; Dept of Chemistry, Widener University, Chester, PA.
- 335 B17 D-Pax2 regulates Crystallin in the developing Drosophila eye. **J. Kavalier, K. Dziedzic.** Dept. of Biol., Colby College, Waterville, ME, USA.
- 336 B18 The novel transcriptional co-repressor Ashwin modulates β -catenin dependent transcription during early *Xenopus* development. **C. Lou, T.B. Alexander, M.C. Barton, Y. Chu, A.K. Sater.** Dept. of Biology and Biochemistry, University of Houston, Houston, TX; Dept. of Biochemistry and Molecular Biology, M.D. Anderson Cancer Center, Houston, TX; Stowers Institute, Kansas City, MO.
- 337 B19 Molecular mechanisms regulating the transcription of an organizer-specific gene: chordin. **Y. Zhang, M. Sheets.** Department of biomolecular chemistry, University of Wisconsin-Madison, Madison, WI, USA.
- 338 B20 hnRNP K is Required for Axon Outgrowth and Neurofilament Protein Synthesis in *Xenopus*. **B.G. Szaro, Y. Liu.** Biology Dept., State University of New York, Albany, NY, USA.
- 339 B21 Identifying Regulatory Elements of the Transcription Factor Tbx5 That Function During Heart Development. **E. Paden, F. Conlon, K. Koshiba-Takeuchi, B. Kaynak, B. Bruneau.** Carolina Cardiovascular Biology Center; UNC Department of Biology; UNC Department of Genetics; Gladstone Institute of Cardiovascular Disease; Department of Pediatrics UCSF.
- 340 B22 Conserved gap43 regulatory regions regulating developmental and regenerative gene expression. **B.W. Kusik, D.R. Hammond, A.J. Udvardia.** Department of Biological Sciences, UW-Milwaukee, Milwaukee, WI, USA; Great Lates WATER Institute, UW-Milwaukee, Milwaukee, WI, USA.
- 341 B23 The transcriptional repressor REST regulates Sonic Hedgehog signaling during zebrafish development. **K.P. Gates, L. Mentzer, H.I. Sirotkin.** Dept. of Neurobiology and Behavior, Stony Brook Univ, Stony Brook, NY, USA.
- 342 B24 Repression of P53 downstream of dual specificity phosphatase 4 is essential for late endoderm specification in early zebrafish development. **M. Snir, J. Brown, B. Feldman.** Medical Genetics Branch, National Human Genome Research Institute, National Institutes of Health, Bethesda, MD, USA.
- 343 B25 Trap230 and Neural Crest Development. **C.E. Haldin, C. LaBonne.** Biochem, Mol. Biol. and Cell Biol. Northwestern Univ, Evanston, IL, USA.
- 344 B26 Optimization of the Gal4-UAS system and generation of a versatile collection of UAS-reporters for zebrafish. **C.M. Akitake, M.G. Goll, J. Rhee, M.J. Parsons, S.D. Leach, M.E. Halpern.** Dept. of Embryology, Carnegie Institution, Baltimore, MD, USA; Dept. of Surgery, Johns Hopkins Medical Institutions, Baltimore, MD, USA.

- 345 B27 Paternal allele-specific methylation at *Rasgrf1* is present in monoallelic and biallelic tissues. **T.L. Davis, L. Dockery, R. Horton, C. Harview, N. Khaselev.** Biology Department, Bryn Mawr College, Bryn Mawr PA 19010 USA.
- 346 B28 Maternal effects of CTCF, a multifunctional epigenetic regulator. **L. Wan, H. Pan, Y. Cheng, J. Ma, A. Fedoriw, V. Lobanenkov, K.E. Latham, R.M. Schultz, M.S. Bartolomei.** Department of Cell and Developmental Biology, University of Pennsylvania School of Medicine, Philadelphia, PA 19104; Department of Biology, University of Pennsylvania, Philadelphia, PA 19104; The Fels Institute for Cancer Research and Molecular Biology,.
- 347 B29 Regulation of Tcf3 repressor activity in mouse embryonic stem cells. **L. Pereira, F. Yi, J. Hoffman, B. Merrill.** Dept. of Biochemistry and Molecular Genetics. University of Illinois at Chicago, IL, USA.
- 348 B30 Wrestling with melanocyte development. **P. Lee, K.M. Taylor, C. LaBonne.** Dept. of Biochemistry, Molecular Biology, and Cellular Biology, Northwestern University, IL, USA.
- 349 B31 Transcriptional regulation of the *FoxO1* gene during mouse development. **B. Villarejo Balcells, P. Rigby, J.J. Carvajal.** The Institute of Cancer Research, Section of Gene Function and Regulation, Chester Beatty Laboratories, London, SW3 6JB, England.
- 350 B32 *Foxn1* is a regulatory target of *Hoxc13* in ectodermal development and dysplasia. **C.S. Potter, N.D. Pruett, M.J. Kern, A.R. Godwin, J.P. Sundberg, A. Awgulewitsch.** Dept. of Medicine, Medical University of South Carolina, Charleston, SC, USA.; Dept. of Cell Biology and Anatomy, Medical University of South Carolina, Charleston, SC, USA.; Dept. of Molecular and Integrative Physiology, University of Kansas Medical Center.
- 351 B33 An in vivo model of CELF-mediated alternative splicing regulation in skeletal muscle. **D.S. Berger, A.N. Ladd, .** Department of Cell Biology, Lerner Research Institute, Cleveland Clinic, Cleveland, Ohio, USA.
- 352 B34 Endothelial Responsiveness of *Ptf1a* and Other Genes in Liver and Dorsal Pancreas Progenitors. **D.A. Freedman-Cass, K.S. Zaret.** Cell and Developmental Biology Program, Fox Chase Cancer Center, Philadelphia PA, 19111, USA.
- 353 B35 *Nkx2.2* Transcriptional Targets Important for Islet Differentiation. **K.R. Anderson, L. Sussel.** Dept. of Biochem., UCHSC, Aurora, CO; Dept. of Gen. and Dev., Columbia Univ., NY, NY.
- 354 B36 Identification and characterization of novel *Fgf17* enhancers active in the rostral forebrain signaling center. **R.V. Hoch, A. Visel, L.A. Pennacchio, J.L.R. Rubenstein.** Dept. of Psychiatry, UCSF, San Francisco, CA; Lawrence Berkeley National Laboratory, Berkeley, CA.
- 355 B37 The role of Slug in Neural Crest. **S.M. Salvador, C. LaBonne.** BMBCB, Northwestern University, Evanston IL USA.
- 356 B38 A Regulatory Network to Segregate the Identity of Neuronal Subtypes. **S. Lee, B. Lee, K. Joshi, S.L. Pfaff, J.W. Lee, S. Lee.** Depts. Molecular Cellular Biology; Molecular Human Genetics; Medicine-Div. Diabetes, Endocrinology & Metabolism; Neuroscience, The Huffington Center on Aging, Program in Developmental Biology, Baylor College of Medicine, Houston, Texas, USA; Gene Expression Laboratory, The Salk Institute, La Jolla, CA, USA.

357 B39 MIR-124 antagonizes the anti-neural REST/SCP1 pathway during embryonic development. **J. Visvanathan, S. Lee, B. Lee, S. Lee.** Departments of Molecular and Human Genetics; Molecular and Cellular Biology, Baylor College of Medicine, Houston, Texas, USA

358 B40 Prrxl1 expression is upregulated upon differentiation in neuronal cells. **F.A. Monteiro, S. Rebelo, C. Reguenga, D. Lima.** Lab. of Mol. Cell Biol., Faculty of Medicine and IBMC, Oporto Univ., Porto, Portugal.

359 B41 Regulation of Cadherin Expression in the Neural Crest by Wnt/ β -Catenin Signaling Pathway. **A.J. Chalpe, A.F. Paulson.** Department of Biology, University of South Dakota, Vermillion, SD, USA.

L5 B42 Identifying Dlk1-Gtl2 regulatory elements. **E.D. Rogers, J.V. Schmidt.** Department of Biological Sciences, University of Illinois at Chicago, Chicago, IL, USA.

Early Embryo Patterning

361 B43 The PAM-1 aminopeptidase regulates centrosome dynamics to ensure anterior-posterior axis specification in one-cell *C. elegans* embryos. **R. Lyczak, P. Greene, S. Marshall.** Dept. of Biology, Ursinus College, Collegeville PA.

362 B44 Asymmetric localization and functional role of the putative non-coding RNA IoLR5. **J. Rabinowitz, J. Lambert.** University of Rochester.

363 B45 RNA segregation and embryonic patterning in a mollusc embryo. **J. Lambert.** Biology, U. of Rochester, Rochester NY.

364 B46 Dissecting RNA localisation pathways in neuroblasts and neurons in the *Drosophila* embryo. **C. Molenaar, D. Ish-Horowicz.** Developmental Genetics Laboratory, London Research Institute, Cancer Research UK, London, UK.

365 B47 The role of VegT in the pre-MBT development of *Xenopus laevis*. **J. Skirkanich.** Department of Cell and Developmental Biology, University of Pennsylvania, Philadelphia, PA, USA.

366 B48 Serotonin signaling regulates morphogenesis of the ciliated gastrocoel roof plate (GRP) epithelium during *Xenopus* left-right axis formation. **P. Vick, A. Schweickert, T. Beyer, T. Weber, S. Bogusch, M. Danilchik, M. Blum.** University of Hohenheim, Institute of Zoology, 70593 Stuttgart, Germany; Department of Integrative Biosciences, OHSU, Portland OR, USA 97239.

367 B49 Regulation of early *Xenopus* development by the Polycomb group protein EED. **C. Chang, M. Cox, J. Fletcher.** Department of Cell Biology, University of Alabama at Birmingham, Birmingham, AL 35294.

368 B50 The Interaction of the Wnt and Nodal Pathways during Organizer Formation in *Xenopus laevis*. **C.D. Reid, D.S. Kessler.** Dept of Cell and Dev Bio, Univ. of Pennsylvania School of Medicine, Philadelphia, PA.

369 B51 Characterization of a novel regulator of canonical Wnt signaling. **Y. Komiya, A. Sato, R. Habas.** Dept. of Biochem., Robert Wood Johnson Medical School-UMDNJ, Piscataway, NJ, USA; Dept. of Biochem. Graduate School of Biomed. Sci., Hiroshima Univ., Hiroshima, Japan.

370 B52 Profilin1 and Profilin2 are non-redundant effectors for Daam1 in non-canonical Wnt signaling and have distinct functions in vertebrate gastrulation. **D.K. Khadka, W. Liu, R. Habas.** Department of Biochemistry, UMDNJ-RWJMS, Piscataway, NJ, USA.

- 371 B53 zic genes act directly downstream of FGF signalling and BMP inhibition to promote a pre-neural state in *Xenopus*. **L. Marchal, G. Luxardi, L. Kodjabachian**. IBDML, Marseille, France.
- 372 B54 An aquaporin gene as a direct target of the Zic1 transcription factor. **E.J. Cornish, S.M. Hassan, C. Merzdorf**. Department of Cell Biology and Neuroscience, Montana State University, Bozeman, MT, USA.
- 373 B55 New Roles for Voltage-gated Calcium Channel β Subunits in Zebrafish Development. **A.M. Ebert, K.E. Gately, K.A. Foltyn, W.A. Horne, D.M. Garrity**. Department of Biology, Colorado State University, Ft Collins, CO; College of Veterinary Medicine, Cornell University, Ithaca, NY.
- 374 B56 Fluid dynamics in zebrafish Kupffer's vesicle. **N. Okabe, R.D. Burdine**. Dept. of Mol. Bio., Princeton Univ. Princeton, NJ, USA.
- 375 B57 Two BMP ligands induce association of two nonredundant BMP Type I receptors to pattern the zebrafish dorsoventral axis. **S.C. Little, M.C. Mullins**. Dept. of Cell and Dev. Biol., Univ. of Penn., Philadelphia, PA.
- 376 B58 BMP signaling progressively patterns the dorsoventral axis from anterior to posterior. **J.A. Tucker, K.A. Mintzer, M.C. Mullins**. University of Pennsylvania, Philadelphia, PA; NYU School of Medicine, New York, NY.
- 377 B59 Tailbud-derived Bmp4 drives proliferation and inhibits maturation of zebrafish chordamesoderm. **R. Esterberg, J. Delalande, A. Fritz**. Biology Dept., Emory University, Atlanta, GA, USA.
- 378 B60 Fgfs in Zebrafish Left-Right Asymmetry. **M.R. Rebagliati, N. Nedza, T. Eggleston, G. Molina, M. Tsang**. Dept. of Anatomy and Cell Biology, Univ. of Iowa, Iowa City, IA, USA; Stowers Institute for Medical Research, Kansas City, MO, USA; Dept. of Mol. Gen. and Biochem., U of Pittsburgh Sch. of Med., Pittsburgh, PA, USA.
- 379 B61 Regulation of canonical Wnt signaling by Brachury is essential for posterior mesoderm formation. **B.L. Martin, D. Kimelman**. Dept. of Biochemistry, University of Washington, Seattle, WA, USA.
- 380 B62 FOXD3 regulation of mesoderm induction in the zebrafish embryo. **L.L. Chang, D.S. Kessler**. Dept. of Cell and Developmental Biology, Univ. of Pennsylvania School of Medicine, Philadelphia, PA, USA.
- 381 B63 Systematic modeling analysis of one-eyed pinhead involved Nodal signaling in zebrafish development. **B. Xu, R.D. Burdine**. Dept. of Molecular Biology, Princeton University, Princeton, NJ, USA.
- 382 B64 Investigating the role of schnitter during zebrafish brain development. **S. Lin, R. Burdine**. Dept. of Mol. Biol., Princeton Univ, Princeton, NJ, USA.
- 383 B65 Moved to Poster Session I, Board B73
- 384 B66 Early neurotransmitter phenotype specification in *Xenopus laevis*. **M. R. Wester, K. Fisher, N. Golub, M. S. Saha**. Dept. of Biol., College of William and Mary, Williamsburg, VA, USA.
- 385 B67 Primary Heart Forming Region of Early Avian Embryo Revealed By Real-Time Positional Fate Map. **C. Cui, C.D. Little, B.J. Rongish**. Dept. of Anatomy and Cell Biology, Univ. of Kansas Medical Center, Kansas City, KS, USA.

- 386 B68 A Unifying Concept of Heart Tube Formation for Avians and Mammals. **R. Abu-Issa, M.L. Kirby**. Department of Natural Sciences, University of Michigan-Dearborn, Dearborn MI 48128; Departments of Pediatrics, Duke University, Durham NC 27510.
- 387 B69 The function of the mammalian Pumilio gene, Pum1, in early embryonic development of mice. **H. Siemen, E. Xu, O. Brüstle, R.A. Reijo Pera**. Inst. for Stem Cell Biology & Regenerative Medicine, Department of OBGYN, Stanford University School of Medicine, Stanford, CA; Inst. of Reconstructive Neurobiology, University of Bonn Medical Center, Bonn, Germany; Department of Obstetrics and Gynecology.
- 388 B70 Tcf3 Regulation of Pluripotency for Lineage Commitment during Gastrulation. **J.A. Hoffman, B.J. Merrill**. Dept. of Biochem. and Mol. Gen., UIC, Chicago, IL 60607.
- 389 B71 Role of paracrine Furin activity during gastrulation. **D. Mesnard, M. Donnison, P.L. Pfeffer, D.B. Constam**. EPFL-ISREC, Epalinges, Switzerland; AgResearch, Hamilton, New Zealand.
- 390 B72 Role of RAC1 in the regulation of axis specification and cell migration during early mouse development. **M.M. Isabelle, A.V. Kathryn**. Dev. Biol. Program, Sloan-Kettering Institute, NY, NY, USA.
- 391 B73 The role of PTEN in anterior-posterior (AP) axis formation in the mouse embryo. **J.E. Bloomekatz, A. Rakeman, H. Alcorn, K.V. Anderson**. Weill-Cornell Graduate School; Sloan-Kettering Institute.
- 392 B74 Anterior Axis Duplication in Mouse Embryos caused by Mutation in Porcn. **S. Biechele, B.J. Cox, O.J. Tamplin, M. Lu, J. Rossant**. Program in Developmental & Stem Cell Biology, SickKids Hospital, Toronto, Canada; Dept. of Mol. Genetics, University of Toronto, Canada.
- 393 B75 Redundant function of Wnt5a and Wnt11 in somitogenesis and anteroposterior axis elongation. **H. Song, A. Kispert, Y. Yang**. GDRB, National Human Genome Research Institute, Bethesda, MD, USA; Institute For Molecular Biology, Medizinische Hochschule Hannover, 30625 Hannover, Germany.
- 394 B76 BMP signaling through ACVR1 is crucial for establishment of the left-right asymmetry via proper formation of node cilia in the mouse. **Y. Mishina, V. Kaartinen, Y. Komatsu**. Lab. of Reproductive and Developmental Tox., Natl. Inst. Environmental Health Sci., NIH, RTP, NC, USA; Dept. of Pathology, Childrens Hosp. Los Angeles Res. Inst. and Keck School of Medicine of the Univ. of Southern California, Los Angeles, CA, USA.
- 395 B77 Endoderm function in Left-Right development in mice. **R.S. Saund, Y. Kanai, M. Kanai, Y. Saijoh**. Dept. of Neurobiol & Anat, Univ Utah, Salt Lake City, UT; Tokyo Univ, Japan; Jikei Univ, Japan.
- 396 B78 Endoderm cell signaling networks during liver and pancreas specification. **E. Wandzioch, K.S. Zaret**. Cell and Developmental Biology Program, Fox Chase Cancer Center, Philadelphia, PA, USA.
- 397 B79 Withdrawn
- 398 B80 O-Fucose modification is essential for patterning mesoderm in the mouse embryo. **J. Du, H. Takeuchi, C. Leonhard, M. Dlugosz, R.S. Haltiwanger, B.C. Holdener**. Dept of Biochem & Cell Biol, Stony Brook Univ, Stony Brook, NY, USA.

Patterning and Transcription Factors

- 399 B81 Regulatory Elements Encoded in the First Intron are Necessary for Proper Expression of the MADS-box Transcription Factors AGL6 and AGL13 in Arabidopsis thaliana. **S.E. Schauer, R. Baskar, P.**

Schlüter, J. Gheyselinck, A. Bolaños, M.D. Curtis, U. Grossniklaus. Institute of Plant Biology, University of Zürich, Zollikerstrasse 107 Zürich, Switzerland CH-8008.

400 B82 OsMADS1 as a transcriptional regulator of rice floral organ fate affects auxin and cytokinin signaling pathways. **S.R. Yadav, U. Vijayraghavan.** Dept. of Micro and Cell Biology, Indian Institute of Science, Bangalore, India.

401 B83 Pattern formation in leaves via small RNA mobility. **D.H. Chitwood, F.T. Nogueira, M.D. Howell, T.A. Montgomery, J.C. Carrington, M.C. Timmermans.** Watson School of Biological Sciences, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA; Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA; Center for Genome Research and Biocomputing, Oregon State University, Corvallis, OR, USA; Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR, USA; Molecular and Cellular Biology Program, Oregon State University, Corvallis, OR, USA.

402 B84 Early zygotic gene regulatory network for epidermis in the ascidian *C. intestinalis*. **S.Q. Irvine, M.D. Blanchette, M.A. Zompa, F.W. Smith.** Dept. of Biological Sciences, Univ. of Rhode Island, Kingston, RI, USA.

403 B85 The *C. elegans* tailless ortholog *nhr-67* functions in uterus and tail development. **J. Schocken, E. Verghese, E. Lisco, S. Eng, M. Twardzik, V. Brown, B. Sanford, S. Bywaters, E. McCain, B. Wightman.** Biology Department, Muhlenberg College, Allentown, PA, 18104 USA.

404 B86 *Drosophila* CtBP causes local inhibition of Dorsal and dCBP that regulate neuroectoderm genes. **H. Aihara, M. Arcilla, S. Lianoglou, M. Stern, Y. Nibu.** Dept. of Cell & Dev. Biol., Weill Medical College of Cornell Univ., New York, NY, USA.

405 B87 Dispensable function of the B' regulatory subunit of Protein Phosphatase 2A (PP2A) in *Drosophila melanogaster*. **H. Moazzen.** Dept. of Biol., Western Ontario Univ., London, ON, Canada.

406 B88 Molecular fluctuations and interpreting spatial gradients, applied to Hunchback pattern formation. **A.V. Spirov, F.J. Lopes, D.M. Holloway.** Appl. Math, SUNY at Stony Brook, NY, USA; Mathematics, British Columbia Inst. of Tech., Burnaby, BC, Canada.

407 B89 Nerfin-1: A novel binding partner of Scalloped. **A. Garg, H. Deng, A. Kuzin, T. Brody, A. Simmonds, W. Odenwald, J. Bell.** Department of Biological Sciences, University of Alberta, Edmonton, Alberta Canada; Neural Cell-Fate Determinants Section, National Institutes of Health, Bethesda, MD, USA; Department of Cell Biology, University of Alberta, Edmonton, Alberta Canada.

L6 B90 *foxD5* regulates a gene pathway that specifies neural ectoderm. **S.A. Moody, B. Yan, K.M. Neilson.** Dept. Anatomy & Regenerative Biology, George Washington University, Washington DC, USA.

409 B91 Clearing Up the Fog in Frog Embryonic Blood Development. **M.S. Mimoto, J.L. Christian.** Cell & Developmental Biology, Oregon Health & Science Univ., Portland, OR.

410 B92 HMGA proteins in *Xenopus laevis*. **R. Vignali, S. Macrì, M. Onorati, E. Basaldella, R. Sgarra, G. Manfioletti.** Dipartimento di Biologia, Università di Pisa, Pisa, Italy; Dipartimento di Scienze della Vita, Università di Trieste, Trieste, Italy.

411 B93 Assessing the effects of Ca²⁺ activity on transcriptional regulators of neurotransmitter phenotype. **A. Hughes, M. Wester, J. Hayes, C. Del Negro, M. Saha.** Dept. of Biol., College of William and Mary, Williamsburg, VA, USA; Dept. of Applied Sci., College of William and Mary, Williamsburg, VA, USA.

- 412 B94 Terminal differentiation gene coexpression in GABAergic and glycinergic neurons. **D. Teasley, M. Wester, M. Saha.** Dept. of Biol., College of William and Mary, Williamsburg, VA, USA.
- 413 B95 Pea3 Ets transcription factors: their role in Fibroblast Growth Factor signaling and embryogenesis. **W.A. Znosko, M. Tsang.** Dept. of Biological Sciences; Dept. of Microbiology & Molecular Genetics, Univ. of Pittsburgh, Pittsburgh, PA 15213 USA.
- 414 B96 The pineal complex/epiphysis is a placode, strictly specified by the combinatorial activity of the transcription factors Flh/Noto and Dlx3. **C. Houart, J. Hutt, I. Foucher, C. Houart.** MRC centre for Dev. Neuro., King's College London, Guy's Campus, London SE1 1UL, UK; Institut Pasteur, Paris, France.
- 415 B97 Retinoic acid signaling plays key roles in the establishment of proximo-distal nephron segments in the zebrafish kidney. **R.A. Wingert, A.J. Davidson.** Massachusetts General Hospital, Boston, MA, USA.
- 416 B98 Embryonic requirement for erbb signaling during zebrafish adult pigment pattern development. **E. Budi, L. Patterson, E. McDonald, D.M. Parichy.** MCB Dept., U of Washington; Bio Dept, U of Washington Seattle, WA.
- 417 B99 Isolation of a novel recessive maternal-effect dorsalizing mutation that expands the organizer. **L.D. Kapp, E. Abrams, F. Marlow, T. Gupta, M.C. Mullins.** Department of Cell and Developmental Biology, University of Pennsylvania, Philadelphia, PA, USA.
- 418 B100 Beta-cell number is limited by the Cdx4 transcription factor. **M.D. Kinkel, V.E. Prince.** Dept. of Organismal Biol. & Anat., Univ. of Chicago, Chicago, IL, USA.
- 419 B101 The role of two Tbx paralogs in otic placode development and otolith formation. **A. Fritz, R. Esterberg, S.G. Setty, C. Snelson, J. Ngai, J.T. Gamse.** Department of Biology, Emory University, Atlanta, GA; Department of Biological Sciences, Vanderbilt University, Nashville, TN; Department of Molecular and Cell Biology, University of California, Berkeley, CA.
- 420 B102 The Forkhead domain transcription factor Foxj1 is the master regulator of the motile ciliogenic program. **S. Roy, H. Habacher, X. Yu.** Institute of Molecular and Cell Biology, Proteos, 61 Biopolis Drive, Singapore 138673.
- 421 B103 *FOXA2* controls the identity and morphology of cells within the medial region of midbrain floor plate. **R. Bayly, S. Agarwala.** Institute for Cellular and Molecular Biology, Univ. of Texas at Austin, Austin, TX USA; Section of Neurobiology, Univ. of Texas at Austin, Austin, TX, USA.
- 422 B104 A transition in Sox2 gene regulation distinguishes the epiblastic and anterior neural plate states. **M. Iwafuchi, T. Takemoto, M. Uchikawa, Y. Kamachi, H. Kondoh.** Dept. of Dev. Biol., Osaka Univ., Suita, Osaka, Japan.
- 423 B105 Detailed analysis of *zic1*, *zic2*, *zic3*, and *zic4* expression in trunk and hindbrain sections of early chick embryos. **A. McMahon, S. Muscarelli, C. Merzdorf.** Department of Cell Biology and Neuroscience, Montana State University, Bozeman, MT, USA.
- 424 B106 Analysis of chicken paraxial mesoderm progenitor transcriptome using microarray technique. **B. Bénazéraf, S. Mathur, K. Zueckert-Gaudenz, G. Hattem, J. Sachintha, T. Olivier, H. Jeff, P. Olivier.** Stowers Institute for Medical Research, 1000 East 50th Street, Kansas City, Missouri 64110, USA.; Howard Hughes Medical Institute, Kansas City, MO 64110 USA.

- 425 B107 Identifying Novel Targets of Ptf1a Using ChIP-on-chip Technology. **S. Scott, S.D. Leach, MD.** Department of Surgery; Department of Cell Biology, Johns Hopkins University School of Medicine, Baltimore, MD, USA.
- 426 B108 Modular patterning of structure and function of the striatum in the forebrain by retinoid receptor signaling. **F. Liu, W. Liao, P. Chambon.** Institute of Neuroscience, National Yang-Ming University, Taipei, Taiwan; Institut de Genetique et de Biologie Moleculaire et Cellulaire, College de France, Strasbourg, France.
- 427 B109 Gbx2 and Fgf8 are sequentially required for formation of the mid-hindbrain compartment boundary. **J. Li, A. Sunmonu, Q. Guo.** Department of Genetics and Developmental Biology, University of Connecticut Health Center, Farmington, CT.
- 428 B110 Six3-promoted holoprosencephaly is caused by the absence of Shh expression in the rostral diencephalon ventral midline. **X. Geng, C. Speirs, O. Lagutin, W. Liu, L. Solnica-Krezel, G. Oliver.** Department of Genetics and Tumor Cell Biology, St. Jude Children's Research Hospital, Memphis, Tennessee 38105-2794, USA; Department of Biological Sciences, Vanderbilt University, Nashville, Tennessee 37235-1634, USA.
- 429 B111 *Zic1* and *Zic4* are required for mammalian cerebellar patterning and growth. **M.C. Blank, I. Grinberg, V.V. Chizhikov, K.J. Millen.** Dept. of Mol. Genet. and Cell Biol.; Dept. of Hum. Genet., The University of Chicago, Chicago, IL, USA.
- 430 B112 Genetic and functional interaction between transcription factors MEF2C and Dlx5/6 is required for craniofacial development. **P. AGARWAL, M.P. Verzi, B.L. Black.** CVRI, University of California, San Francisco, CA, USA.
- 431 B113 Functional Equivalence between *Osr1* and *Osr2* in Mouse Development. **Y. Gao, Y. Lan, C.E. Ovitt, R. Jiang.** Department of Biomedical Genetics, University of Rochester, Rochester, NY, USA; Center for Oral Biology, University of Rochester, Rochester, NY, USA.
- 432 B114 The role of Dlx3 in Hair Development. **J. HWANG, T. MEHRANI, S.E. MILLAR, M.I. MORASSO.** Developmental Skin Biology Unit, NIAMS, NIH, Bethesda, MD 20892, USA; Dept. of Dermatology and Cell and Developmental Biology, Univ. of Pennsylvania School of Medicine, Philadelphia, PA 19104, USA.
- 433 B115 Molecular consequences of a frameshifted Dlx3 mutant leading to Tricho-Dento-Osseous syndrome. **O. Duverger, D. Lee, M.Q. Hassan, S.X. Chen, F. Jaisser, J.B. Lian, M.I. Morasso.** Dev Skin Biol Unit, NIAMS/NIH, Bethesda, MD, USA; UMass Medical School, Worcester, MA, USA; INSERM U772, College de France, Paris, France.
- 434 B116 Role of T and Tbx6 in mesodermal patterning. **A.K. Wehn, D.L. Chapman.** Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA, USA.
- 435 B117 The identity and fate of Tbx4-expressing cells reveal previously unknown developmental decisions in the allantois, limb, and proctodeum. **L.A. Naiche, R. Arora, V.E. Papaioannou.** Cancer and Developmental Biology, National Cancer Institute, Frederick, MD; Department of Genetics and Development, Columbia University, New York, NY.
- 436 B118 Ash2l: A Novel Interacting Cofactor of DiGeorge Syndrome Transcription Factor Tbx1. **J.Z. Stoller, L. Huang, J.A. Epstein.** Div. of Neonatology, Children's Hosp. of Phila., Univ. of Penn., Phila., PA, USA; Dept. of Cell and Dev. Biol., Univ. of Penn., Phila., PA, USA.

- 437 B119 Processing of Lunatic fringe protein by subtilisin/furin-like proprotein convertases contributes to its short intracellular half-life. **E.T. Shifley, S.E. Cole.** Dept. of Molecular Genetics, The Ohio State University, Columbus, OH, USA.
- 438 B120 Evidence for *Hox*-Specified Positional Identities in Adult Vasculature. **N.D. Pruett, R. Visconti, D. Scholz A. Awgulewitsch.** Dept. of Medicine, MUSC, Charleston, SC, USA; Dept. of Cell Biology, MUSC, Charleston, SC, USA.
- 439 B121 Only posterior interdigit provides positional information to its anterior PFR to specify each digit identity. **T. Suzuki, S.M. Hasso, T. Ogura, J.F. Fallon.** Dept. of Anatomy, University of Wisconsin, Madison, WI, USA; Dept. of Developmental Neurobiology, IDAC, Tohoku University, Sendai, Japan.
- 440 B122 Sonic Hedgehog signaling in the Apical Ectodermal Ridge is essential for proper patterning of the vertebrate limb. **C.M. Bouldin, W.J. Scott, B.D. Harfe.** Department of Molecular Genetics and Microbiology, Genetics Institute, University of Florida, Gainesville, FL 32610; Division of Developmental Biology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio 45229.
- 441 B123 Dual, separable roles of Sonic hedgehog in limb bud patterning and expansion. **J. Zhu, E. Nakamura, M. Nguyen, X. Bao, S. Mackem.** Laboratory of Pathology, NCI, NIH, Bethesda, MD, USA.
- 442 B124 Regulation of Differential Gene Expression in the Neural Tube by the Morphogen Sonic Hedgehog. **N. Balaskas, K. Hill, V. Ribes, J. Briscoe.** Developmental Neurobiology, National Institute for Medical Research, London, NW7 1AA, UK; These authors contribute equal to this work; Author for correspondence.
- Organogenesis**
- 443 B125 An ENU screen reveals novel genes required for mammalian forebrain development. **R.W. Stottmann, Y. Yun, D. Beier.** Div. of Genetics, Brigham & Women's Hospital, Harvard Medical School, Boston, MA, USA.
- 444 B126 Evidence for cell sorting in the pituitary gland. **S.W. Davis, A.H. Mortensen, M.A. Potok, S.A. Camper.** Department of Human Genetics, University of Michigan, Ann Arbor, MI.
- 445 B127 Reassessing BMP's Role In Early Development Of Cranial Placodes. **B.B. Riley, H. Kwon, N. Bhat, R.A. Cornell.** Biology Department, Texas A&M University, College Station, TX 77843; Department of Anatomy and Cell Biology, University of Iowa, Iowa City, IA 52242.
- 446 B128 FGF signalling is involved in the induction and morphogenesis of the inner ear. **R.K. Ladher, S. Freter, X. Sai.** Lab for Sensory Development, RIKEN CDB, 2-2-3 Minatojima-Minamimachi, Chuo-ku, Kobe, Japan.
- 447 B129 Hindbrain Rhombomere 4 Induces Authentic Inner Ear Vesicles in the Chick. **Y. Li, S. R. Hilfer.** Center for Regenerative Medicine and Skeletal Development, MC3705, Department of Reconstructive Sciences, University of Connecticut Health Center, School of Dental Medicine, Farmington, CT, USA; Department of Biology, Temple University, Philadelphia, PA,.
- 448 B130 Inner ear auditory progenitors are directly dependent on Hedgehog Signaling. **A.S. Brown, M. Riccomagno, D.J. Epstein.** Dept. of Genetics, Univ. Pennsylvania School of Medicine.
- 449 B131 The Role of Ldb Complexes in Lens Development. **T. Cohen, H. Westphal.** LMGD, NICHD, NIH, Bethesda, MD, USA.

- 450 B132 Hoxa2 Acts as a Repressor in the Developing Murine Palate. **T.M. Smith, A.J. Nazarali.** Laboratory of Molecular Biology, College of Pharmacy & Nutrition, University of Saskatchewan, SK, Canada.
- 451 B133 Tbx-associated transcriptional corepressor, Ripply3, plays essential roles in pharyngeal development. **T. Okubo, A. Kawamura, J. Takahashi, A. Ohbayashi, S. Takada.** Okazaki Institute for Integrative Bioscience, NINS, Japan.
- 452 B134 Antagonistic Functions of Jagged-Notch and Edn1 Signaling Control Dorsal-Ventral Patterning of the Vertebrate Face. **C. Gage, E. Zuniga, F. Stellabotte.** Center for Stem Cell and Regenerative Medicine, University of Southern California, Los Angeles, CA, USA.
- 453 B135 A mouse model of Costello syndrome through tissue-specific activation of Kras. **A. Mukhopadhyay, S.R. Krishnaswami, B.D. Yu.** Division of Dermatology, Department of Medicine, University of California, San Diego, CA 92093, USA.
- 454 B136 The LIM-domain binding protein Ldb1 is required for proper endocardial cushion formation during heart development in *Mus musculus*. **M.D. Phillips, D. Bogen, H. Westphal.** Laboratory of Mammalian Genes and Development, PGD, NICHD, NIH, Bethesda MD USA.
- 455 B137 Monocilia in the embryonic mouse heart imply a direct role for cilia in cardiac morphogenesis. **M. Brueckner, J. Slough, L. Cooney.** Department of Pediatrics, Yale University School of Medicine, New Haven, CT, USA; Department of Genetics, Yale University School of Medicine, New Haven, CT, USA.
- 456 B138 INVESTIGATING BMP-SIGNALING FUNCTIONS IN SECOND HEART FIELD. **J. Wang, L. Ma, M.B. Claudio, J.F. Martin.** Institute of Biosciences and Technology, Texas A&M University, Houston, TX, USA.
- 457 B139 Nodal dependent and independent axis conversions during asymmetric morphogenesis of the zebrafish heart. **K. Baker, N.G. Holtzman, R.D. Burdine.** Dept. of Mol. Biol., Princeton Univ., Princeton, NJ, USA; Biol. Dept., Queens College, City Univ. of New York, Flushing, NY, USA.
- 458 B140 3-O-sulfotransferase is required for cardiac development and physiology in zebrafish. **S.C. Samson, T. Ferrer, M. Tristani-Firouzi, H. Yost.** Neurobiology & Anatomy, University of Utah, Salt Lake City, UT; Pediatrics, University of Utah, Salt Lake City, UT, USA.
- 459 B141 Channel Independent functions of L-Type Calcium Channel Beta-2 Subunit. **Y. Chernyavskaya, A. Ebert, S. Bisbee, D. Garrity.** Dept. of Biology, Colorado State University, Fort Collins, CO, USA.
- 460 B142 Tbx5-Mediated β 2 CaMK-II Expression is Required for Heart Looping and Pectoral Fin Development. **S.C. Rothschild, C.A. Easley, L. Francescatto, J.A. Lister, D.M. Garrity, R.M. Tombes.** Dept. Biology, Virginia Commonwealth University (VCU), Richmond, VA; Dept. Biochemistry, VCU, Richmond, VA; Dept. Human Genetics, VCU, Richmond, VA; Dept. Biology, Colorado State Univ., Fort Collins, CO.
- 461 B143 Hedgehog signaling plays a cell-autonomous role in maximizing cardiac developmental potential. **D. Yelon, N.A. Thomas, M. Koudijs, F. Van Eeden, A.L. Joyner.** Skirball Institute, NYU School of Medicine, New York, NY, USA; University of Sheffield, Sheffield, UK; Memorial Sloan-Kettering Cancer Center, New York, NY, USA.
- 462 B144 Expression patterns of sox9 gene during chick heart development. **T. Yamagishi, Y. Nakajima, K. Ando, M. Sakabe, H. Nakamura.** Dept. of Anat., Saitama Medical Univ., Saitama, Japan.; Dept. of Anat., Graduate School of Medicine, Osaka City Univ., Osaka, Japan.

- 463 B145 Endothelial Deletion of PlexinD1 Results in Congenital Heart, Vascular and Skeletal Defects. **Y. Zhang, Y. Yoshida, M. Lu, J.A. Epstein.** Dept. of Cell and Molecular Biology, University of Pennsylvania, PA, USA; Dept. of Biochemistry and Molecular Biophysics, Columbia University, New York, USA.
- 464 B146 Snail1 transcription factor in bone development and homeostasis. **C. Alvarez de Frutos, R. Dacquin, S. Vega, I. Machuca-Gayet, A. Nieto.** Instituto de Neurociencias (CSIC-UMH), San Juan de Alicante, 03550, Spain; INSERM, unite 433, Lyon, France.
- 465 B147 Making and shaping seamless tubes. **A.S. Ghabrial.** Department of Cell & Developmental Biology, University of Pennsylvania School of Medicine, Philadelphia, PA.
- 466 B148 Expression and Functional Analysis of miRNAs in Kidney Development. **R. Agrawal, U. Tran, O. Wessely.** Dept. Cell Biology & Anatomy, LSUHSC, New Orleans, LA.
- 467 B149 Gata3 and its role in urogenital system development. **D. Grote, A. Souabni, X. Chi, C.E. Merkel, T.J. Carroll, F. Costantini, M. Bouchard.** McGill Cancer Centre, Dept. of Biochem., McGill Univ., Montreal, QC, Canada; IMP, Univ. of Vienna, Vienna, Austria; Dept. of Gen. & Dev., Columbia Univ., New York, NY, USA; Dept. of Int. Med. & Mol. Bio., Univ. of Texas Southwestern Med. Center, Dallas, T.
- 468 B150 Epithelial integrity requires a signal from underlying stroma: the nephric coelomic epithelium as a novel experimental model. **T. Yoshino, D. Saito, Y. Takahashi.** Graduate School of Biological Sciences, NAIST, Nara, Japan.
- 469 B151 Utilizing a Small Molecule Screen to Delineate Kidney Development. **N.A. Hukriede, E.D. De Groh, R. Jackson, W. Dai, B.W. Day, T.E. Smithgall.** Microbiology and Molecular Genetics, University of Pittsburgh School of Medicine; Pharmaceutical Sciences, University of Pittsburgh School of Pharmacy, Pittsburgh, PA, USA.
- 470 B152 Transcriptional Control of Podocyte Development in Xenopus. **J.T. White, O. Wessely.** Dept. Cell Biology & Anatomy, LSUHSC, New Orleans, LA.
- 471 B153 Wnt2a/2b are required for lung specification and development through activation of canonical signaling. **A.M. Goss, Y. Tian, Z. Wang, T. Yamaguchi, E. Morrisey.** Department of Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA 19104; Cancer and Developmental Biology Laboratory, NCI-Frederick, Frederick, MD 21701.
- 472 B154 Synergistic activation of canonical signaling by a subset of Wnt ligands. **M.F. Miller, E. Cohen, A.M. Goss, J. Baggs, J. Hogenesch, E.E. Morrisey.** Dept. of Med, Univ of Penn, Philadelphia, PA; Dept. of Cell and Dev. Bio, Univ of Penn, Philadelphia, PA; Dept. of Pharm, Univ of Penn, Philadelphia, PA.
- 473 B155 Examination of the roles of Nkx2.1 and Fgf10 in Xenopus laevis lung development. **B.A. Hyatt, D. Einerson, J. Robertson, D. Judd, B. Einerson, D.N. Cornfield.** Department of Biological Sciences, Bethel University, St. Paul, MN, USA; Department of Pediatrics, Stanford University, Palo Alto, CA, USA.
- 474 B156 Ngn3 expression in differentiated islet cells contributes to islet cell maintenance and function. **G. Gu, S. Wang, A. Zhao, Y. Xu, Y. Dor.** Dept. Cell Dev. Biol, Vanderbilt Medical Center, Nashville, TN USA; . Cellular Biochemistry & Human Genetics, The Hebrew University-Hadassah Medical School, Jerusalem. Israel.
- 475 B157 Myt1 and Ngn3 form a feed-forward expression loop to promote endocrine islet cell differentiation. **S. Wang, J. Hecksher-Sorensen, L. Rosenberg, P. Serrup, G. Gu.** Dept. Cell Dev. Biol,

Vanderbilt Medical Center, Nashville, TN USA; Hagedorn Research Institute, Dept. Dev. Biol, Niels Steensens Vej 6, Gentofte, Denmark.

476 B158 Thyroid hormone controls remodeling of the exocrine and endocrine pancreas during metamorphosis in *Xenopus laevis*. **S. Mukhi, D. Brown**. Department of Embryology, Carnegie Institution, Baltimore, MD 21218.

477 B159 Roles of Bmp, Fgf and Wnt signaling in liver formation and recovery in zebrafish embryos. **S. Donghun, D.Y. Stainier**. Dept. of Biochemistry & Biophysics, UCSF, San Francisco, CA, USA.

478 B160 Zebrafish homologue of FKBP65 plays a role in intestinal smooth muscle differentiation. **T. Akhtar, R. Yerry, K.N. Wallace**. Department of Biology, Clarkson University, Potsdam, NY USA.

479 B161 Effect of thyroid hormone on gut development in a direct developing frog. **S. Singamsetty, R.P. Elinson**. Dept of Biol Sci., Duquesne Univ., Pittsburgh, PA, USA.

480 B162 Alpha 2-Macroglobulin regulation of axial and gut morphogenesis in *Xenopus laevis*. **L.L. Pineda Salgado, D. Kessler**. Department of Cell and Developmental Biology. UPENN, Philadelphia, PA, USA.

481 B163 Understanding the Function of Nonmuscle Myosin II-A (NM II-A) In Vivo. **A. Wang, X. Ma, S. Kawamoto, R.S. Adelstein**. LMC/NHLBI, Bethesda, MD.

482 B164 Coordinate regulation of organ morphogenesis in *C. elegans*. **D.S. Fay, K. Mani**. Department of Molecular Biology, University of Wyoming.

483 B165 A Genetic Screen to Identify Genes Necessary for *C. elegans* Pharynx Muscle Development. **P.A. Smith, M.E. Ali, E. Pahomov, A. Porter, A.R. Ferrier, P.A. Smith**. Dept. of Biology, Lake Forest College, Lake Forest, IL, USA.

484 B166 Global Analysis of the LEAFY Transcriptional Network: Transitioning to Reproductive Development in *Arabidopsis thaliana*. **C. Winter, D. Wagner**. Department of Biology, University of Pennsylvania.

485 B167 The histone acetyltransferase GCN5 affects floral bud initiation and stamen development in *Arabidopsis*. **A.T. Hark, R. Cohen, J. Schocken, E.R. McCain**. Biology Department, Muhlenberg College, Allentown, PA 18104, USA.

486 B168 Morphogenesis, meristems and maize: Genetic regulation of inflorescence development in plants. **P. McSteen, A. Skirpan, S. Barazesh, X. Wu, K. Phillips**. Department of Biology, Penn State University, University Park, PA, USA.

487 B169 Vesicular Trafficking and Cell Expansion During Maize Leaf Development. **D. Hill, X. Ling, A. Luo, M. Tamkun, A. Sylvester**. Dept. of Molec. Biol, Univ. Wyoming, Laramie, WY; Dept. of Biomed. Sci., CSU, Fort Collins, CO.

146 B170 Imaging the Epithelial-to-Mesenchymal Transformation of Avian Trunk Neural Crest Cells. **J.D. Ahlstrom, C.A. Erickson**. Section of Molecular and Cellular Biology, UC Davis, Davis, CA, USA.

Late Abstracts

L7 B171 EPB41L5 Functions to Post-transcriptionally Regulate Cadherin and Integrin During Epithelial-Mesenchymal Transition. **M. Hirano, S. Aizawa**. Lab. for Vertebrate Body Plan, Center for Developmental

Biology (CDB), RIKEN KOBE, Hyogo, Japan; Lab. for Animal Resources and Genetic Engineering, Center for Developmental Biology (CDB), RIKEN KOBE, Hyogo, Japan.

L8 B172 Eph receptor and NR4A nuclear receptor signaling regulate somatic gonad morphogenesis in *Caenorhabditis elegans*. **C.R. Gissendanner, C. Emfinger, A. Guerrero**. Department of Biology, University of Louisiana at Monroe, Monroe, LA, USA.

L9 B173 Inactivation of Fibroblast Growth Factor 9 signaling in mouse lung reveals a requirement in airway smooth muscle development. **E.T. Domyan, L. Yi, M. Lewandowski, X. Sun**. Laboratory of Genetics, University of Wisconsin-Madison, Madison, WI, USA; Cancer and Developmental Biology Lab, National Cancer Institute, Frederick Cancer Research & Development Center, Frederick, MD, USA; These authors contributed equally to this work.

L10 B174 Function of Sproutys in Salivary Gland Branching Morphogenesis. **W.M. Knosp, M.P. Hoffman, G.R. Martin**. Department of Anatomy and CVRI, UCSF, San Francisco, CA 94158; Laboratory of Cell and Developmental Biology, NIDCR, NIH, DHHS, Bethesda, MD 20892.

L11 B175 Coordinate polarization of hair follicles is governed by a conserved planar cell polarity pathway. **D. Devenport, E. Fuchs**. Laboratory of Mammalian Cell Biology and Development, Howard Hughes Medical Institute, The Rockefeller University, New York, NY, USA.

L12 B176 Tissue Interactions During Development of the Excretory System in *Xenopus laevis* Embryos. **A. Pinto, K. Litman, K. Casal, V. Gerrard, J. Drawbridge**. Dept. of Biology, Rider University, Lawrenceville, NJ, USA; Mercer County Community College, West Windsor, NJ USA.

L13 B177 Hemodynamic Forces Affect Gene Expression in the Developing Heart. **C.A. Shaut, K.L. Thornburg**. Heart Research Center; Div. of Cardiovascular Med, OHSU, Portland, OR, USA.

L14 B178 Expression of GDNF in *Xenopus* embryos. **V. Gerrard, L. Sferrazza, N. Revere, J. Drawbridge**. Dept. of Biology, Rider University, Lawrenceville, NJ, USA.

L15 B179 Primary mouth formation. **A.J. Dickinson, H.L. Sive**. Whitehead Institute for Biomedical Research, Cambridge, MA, USA; Massachusetts Institute of Technology, Cambridge, MA, USA.

L16 B180 APOBEC2, a putative nucleic acid editing enzyme, is required for paraxial mesoderm and left-right patterning in *Xenopus laevis*. **A. Vonica, A.H. Brivanlou**. Lab. Vertebrate Embryology.

L17 B181 Fibroblast Growth Factor Signaling Is Required For Parapineal Formation. **J.A. Clanton, P.R. Reppert, J.T. Gamse**. Dept. of Biological Sciences, Vanderbilt University, Nashville, TN, USA.

L18 B182 Patterns of expression of brd2a and brd2b in zebrafish spermatogenesis. **J. Rodriguez, A.J. DiBenedetto**. Dept. of Biol., Villanova University, Villanova, PA, USA.

L19 B183 RNA expression and mechanism of localization of brd2b in zebrafish oocytes. **L. Francis, A.J. DiBenedetto**. Dept. of Biol., Villanova University, Villanova, PA, USA.

L20 B184 Insights into Checkpoint Regulation of Dorsal / Ventral Patterning in *Drosophila* Oogenesis. **S.B. Ferguson, T. Schupbach**. Department of Molecular Biology, Princeton University, Princeton, NJ, USA; Howard Hughes Medical Institute.

L21 B185 The regulatory role of Dicer on folliculogenesis in mice. **L. Lei, S. Jin, G. Gonzalez, R.R. Behringer, T.K. Woodruff**. Department of Obstetrics and Gynecology, Northwestern University, Chicago, IL,

USA; Department of Molecular Genetics, University of Texas, MD Anderson Cancer Center, Houston, TX, USA.

L22 B186 Dissecting the feedback circuit in BMP signaling in the pre-gastrula *Drosophila* embryo. **J.F. Gavin-Smyth, Y. Wang, C. Ferguson.** MGCB; OBA, University of Chicago.

L23 B187 The Role Of Cell Cycle Regulator Cugbp1 In Zebrafish Lens Development. **J.M. Hayes, J.M. Gross.** Dept. of MCDB, University of Texas at Austin, Austin, TX.

L24 B188 Disruption of glycosaminoglycan signaling enhances mesenchymal stem cell-derived osteogenic differentiation. **V. Nurcombe, K.J. Manton, S.M. Cool.** Institute of Molecular and Cell Biology (IMCB), Proteos, 61 Biopolis Drive Singapore 138673.

L25 B189 PTHrP regulation of LEF1 expression and localization in the mesenchymal C3H10T1/2 cells. **J.R. Hens, E.M. Tanski.** Dept. of Biology, St. Bonaventure University, St. Bonaventure, NY USA.

L26 B190 Trophoblast- and pluriblast- specific gene expression in *Monodelphis domestica* cleavage-stage embryos. **J.T. Morrison, N.S. Bantilan, Y.P. Cruz.** Oberlin Coll., Oberlin, OH, USA.

L27 B191 Depletion of microRNAs in mouse neural stem cells causes late embryonic. **G.L. Laboni, F.K. Sarah, D.L. Beverly.** Iowa Biosciences Advantage, Univ. of Iowa, IA, USA; Dept of Molecular physiology and biophysics, Univ. of Iowa, IA, USA; Medical Scientist Training Program, Univ. of Iowa, IA, USA; Dept of Internal Medicine, Univ. of Iowa, IA, USA.

L28 B192 Characterization of Cordon-Bleu function in the mouse embryo. **L.M. Custer, E.C. Driver, J. Klingensmith.** Dept. of Cell Biology, Duke Univ Med Center, Durham, NC 27710.

L29 B193 Epibranchial placodes generate taste neurons which express BDNF and TrkB. **D.E. Harlow, H. Yang, T. Williams, L.A. Barlow.** Dept of Cell & Dev Biol, Univ of Colorado Denver, Anschutz Medical Campus, Aurora, CO, USA; Dept of Craniofacial Biol., Univ of Colorado Denver, Anschutz Medical Campus, Aurora, CO, USA.

L30 B194 Hox-c function in spinal cord development. **J. Liu, J. Blackburn, N. Ghitani, M. Rich, J. Dasen, T. Jessell.** Dept. of Neuroscience, Univ. of Virginia, Charlottesville, VA, USA; Smilow Neuroscience Program, NYU, New York, NY, USA; HHMI, Columbia Univ., New York, NY, USA.

L31 B195 Regulation of pontine development by the transcription factor Nfib. **A. Kumbasar, R.M. Gronostajski, D. Litwack.** Anat. and Neurobiology; Program in Neurosci., Univ. of Maryland, Baltimore, MD; Biochem. and Program in Neurosci., SUNY, Buffalo, NY.

L32 B196 Asymmetric signalling by Fgf8 at the mid-hindbrain boundary: modulation of ERK MAP kinase activity by DUSP6/Mkp3 phosphatase. **P. Tandon, S. Payton, N. Fragale, R. Dickson, S. Keyse, I. Mason.** MRC Centre for Developmental Neurobiology, King's College London, UK; Cancer Research UK, Division of Cell and Developmental Biology, University of Dundee, UK.

L33 B197 Role of ADAM metalloproteases in cranial neural crest cell migration in *Xenopus laevis*. **H. Cousin, C. McCusker, D. Alfandari.** Veterinary and Animal Sciences, University of Massachusetts, Amherst, MA, USA.

L34 B198 The zebrafish rushhour gene controls motor axon and cardiac neural crest cell migration. **S. Banerjee, M. Granato.** CDB, Univ of Pennsylvania, Philadelphia, PA, USA.

- L35 B199 RhoV regulates epibolic movement in zebrafish. **H. Tay, E. Manser**. RGS Group, Institute for Medical Biology, Immunos Building, Singapore; NUS Graduate School for Integrative Sciences and Engineering, Graduate Program of Bioengineering, Singapore.
- L36 B200 Praja, a RING E3 ubiquitin ligase, may modulate TGF- β ; signaling through Smad3 and type II beta-spectrin, thereby influencing epiboly, cell survival, nervous system development and cancer progression. **E. Glasgow, L. Mishra**. Dept. of Surgery, Georgetown University, Washington, DC, USA.
- L37 B201 Complexity of Zebrafish Wnt5b Locus and Implications in Beta-catenin Signaling and Polarized Cell Movement. **S. Lin, T.A. Westfall, H.L. Griesbach, D.C. Slusarski**. Univ. of Iowa, Dept. of Biol., Iowa City, IA, USA.
- L38 B202 Role of ErbB receptors and ligands in cartilage development. **S. Amin, C.N. Dealy**. Center for Regenerative Medicine and Skeletal Development, University of Connecticut Health Center, Farmington, CT.
- L39 B203 Regulation of myostatin activity by SPC family proprotein convertases. **D.M. Ho, M. Whitman**. Dept. of Developmental Biology, Harvard School of Dental Medicine, Boston, MA, USA.
- L40 B204 LIGs -- A New Signaling Lingo. **H. Haridas, C. Ernst, T.A. Evans, J.B. Duffy**. Dept of Biology and Biotechnology, WPI, MA, USA; Department of Neuroscience, University of Pennsylvania School of Medicine, Philadelphia, PA.
- L41 B205 Fats, Flies and Baldspot -- studying elongases in Drosophila. **P. Gupta, J.B. Duffy, S. Mandal**. Dept. of Biology & Biotechnology, WPI, MA, USA.
- L42 B206 Dynamics of Cdx2, Nanog and Oct4 expression in the preimplantation mouse embryo. **I. Tabansky, K. Niakan, K. Eggan**. HSCI, Harvard Univ, Cambridge, MA; Stowers Medical Institute, MCB, Harvard Univ, Cambridge, MA.
- L43 B207 Formation and Patterning of the Mouse Definitive Endoderm. **P.A. Hoodless, J. Hou, K.D. McKnight**. Terry Fox Laboratory, BC Cancer Agency, Vancouver, BC, Canada; Dept. of Medical Genetics, University of British Columbia, Vancouver, Canada.
- L44 B208 Evaluating nutrient media for in vitro culture of *Monodelphis domestica* embryos. **V.N. Wang, J.M. McCammon, Y.P. Cruz**. Oberlin Coll., Oberlin, OH, USA; Univ. Calif. Berkeley, CA, USA.
- L45 B209 The zebrafish *mga* orthologue is required in the yolk syncytial layer to activate BMP signals during gastrulation. **X. Fan, C. Sias, N. Backus, S.T. Dougan**. Department of Cellular Biology, University of Georgia, Athens GA, USA.
- L46 B210 Investigation of Drosophila Squid homologs in zebrafish. **M.L. O'Connell, A. Mone**. Dept. of Biology, The College of New Jersey, Ewing, NJ, USA.
- L47 B211 *umleitung*/(brother of *CDO*) is required for retinal axon guidance and ventral CNS specification in the zebrafish. **S.A. Bergeron, R.O. Karlstrom**. Biol. Dept., Univ. of Massachusetts, Amherst, MA, USA.
- L48 B212 Zebrafish *emx3* regulates differentiation of dorsal telencephalic neurons. **G. Aspöck, C. Ciuckitu, M. Rissler, Z.M. Varga, M. Westerfield**. Inst. of Neuroscience, Univ. of Oregon, Eugene, OR, USA; Inst. of Zoology, Univ. of Freiburg, Germany; ZIRC, Univ. of Oregon, Eugene, OR, USA.
- L49 B213 Dissecting the Function of the Pitx2c N-terminus in Left-Right Patterning. **A.K. Ryan, A. Simard, L. Di Giorgio, L. Levesque**. Dept. Pediatrics, McGill University, Montreal, Quebec, Canada; Research Institute of the McGill University Health Center, Montreal, Quebec, Canada.

- L50* B214 A novel adaptor protein btbd6a targets the degradation of an inhibitor to enable neuronal differentiation. **D.F. Sobieszczuk, A.Poliakov, D.G. Wilkinson.** Div of Develop Neurobiol., MRC National Institute for Med Research, London, UK.
- L51* B215 Dynamic regulation of a tissue-specific mesodermal transcription factor. **S.G. Meyers, A.K. Corsi.** Dept of Biol, The Catholic Univ of America, Washington, DC.
- L52* B216 Molecular Characterization of *C. elegans* pat-9. **Q. Liu, R. Bachmann, B.D. Williams, P.L. Jones.** Dept of Cell and Dev Biol Univ. of Illinois at Urbana-Champaign, Urbana, IL, USA.
- L53* B217 Regulation of Ci-Leprecan expression in the ascidian embryo is controlled by Brachyury in the notochord and by antagonistic signals in the muscle. **M.P. Dunn, A. Di Gregorio.** Dept. of Cell and Dev. Biol, Weill Cornell Grad. School of Med. Sci., New York, NY, USA.
- L54* B218 A Mouse Model for Juvenile Hydrocephalus. **O. Appelbe, E.A. Glick, J.R. Ramalie, E.Y. Steshina, J.V. Schmidt.** Department of Biological Sciences, University of Illinois at Chicago, Chicago, IL, USA.
- L55* B219 A zebrafish model of Treacher-Collins syndrome. **J.A. Lister, M. Holser, A.D. Patel, R. Shiang.** Department of Human and Molecular Genetics, Virginia Commonwealth University, Richmond, VA 23298 USA.
- L56* B220 Evolutionary conservation of vertebrate notochord genes in the ascidian *Ciona intestinalis*. **J.E. Kugler, Y.J. Passamanek, T.G. Feldman, J. Beh, T.W. Regnier, A. Di Gregorio.** Department of Cell and Developmental Biology, Weill Medical College of Cornell University, 1300 York Avenue, New York, NY 10065, USA; Department of Molecular and Cellular Biology, Division of Genetics and Development, University of California, Berkeley, C.
- L57* B221 Nodal signaling in early development of hemichordate enteropneust, *Saccoglossus kowalevskii*. **M. Wlizla, S. Darras, J. Gerhart, C.J. Lowe.** Committee on Developmental Biology, University of Chicago, Chicago, IL, USA; Institut de Biologie du Développement de Marseille-Luminy, CNRS/Université de la Méditerranée, Marseille, France; Department of Molecular and Cell Biology, University of Californ.
- L58* B222 AP axis specification in a higher fly with an anterior-dorsal serosa anlage. **S. Lemke, U. Schmidt-Ott.** Dept. of Organismal Biology and Anatomy, University of Chicago, Chicago, IL, USA.
- L59* B223 Commissureless Regulation of Slit-Robo Signaling in Insects. **M.A. Seeger, B. Abramowitz, L. Carver.** Dept. of Molecular Genetics, Ohio State Univ., Columbus, OH, USA.
- L 60* B224 Deriving structure from evolution : segmentation in silico. **P. Francois, V. Hakim, E.D. Siggia.** The Rockefeller University, New York, NY, USA; Ecole Normale Supérieure, Paris, France.
- L 61* B225 LEM domain proteins of the nuclear lamina make unique and overlapping contributions to *Drosophila* development. **B.S. Pinto, S.R. Wilmington, E.E.L. Hornick, L.L. Wallrath, P.K. Geyer.** University of Iowa, Iowa City, IA, USA.