False-colored scanning electron micrograph of a zebrafish (Danio rerio) embryo (~0.7 millimeters across) at a late stage of development. Biophysical studies of model organisms such as zebrafish reveal forces that organize tissue patterns and shape cell layers and physical features (segments, cavities, and folds). The special section beginning on page 209 presents work in which physicists and biologists collaborate to explain the physical mechanisms of animal development.

Image: Dr. Richard Kessel/Visuals Unlimited, Inc.
BREVIA

221 Genome Sequencing Identifies a Basis for Everolimus Sensitivity
G. Iyer et al.
Tumor genome sequencing reveals the molecular basis of a patient’s unexpected and dramatic response to a cancer drug.

RESEARCH ARTICLES

222 A High-Coverage Genome Sequence from an Archaic Denisovan Individual
M. Meyer et al.
A close-up look provides clues to the relationships between modern humans, Denisovans, and Neandertals.

226 Cilia at the Node of Mouse Embryos Sense Fluid Flow for Left-Right Determination via Pkd2
S. Yoshio et al.
A Ca\(^{2+}\) channel implicated in polycystic kidney disease helps to establish the left-right body axis of the mammalian embryo.

228 Strain Tuning of Individual Atomic Tunneling Systems Detected by a Superconducting Qubit
G. J. Grabovskij et al.
A process responsible for the decoherence of superconducting qubits is controlled using mechanical strain.

234 Observation of Resonances in Penning Ionization Reactions at Sub-Kelvin Temperatures in Merged Beams
A. B. Henson et al.
Minimizing the relative velocity spread among reaction partners in a supersonic beam reveals nonclassical dynamics.

238 An Ancient Core Dynamo in Asteroid Vesta
R. R. Fu et al.
Paleomagnetic studies of a meteorite from asteroid Vesta reveal remanent magnetization produced by an ancient core dynamo.

242 Elemental Mapping by Dawn Reveals Exogenic H in Vesta’s Regolith
T. H. Prettyman et al.

246 Pitted Terrain on Vesta and Implications for the Presence of Volatiles
B. W. Denevi et al.
Analysis of data from the Dawn spacecraft implies that asteroid Vesta is rich in volatiles.

250 Sombrero Uplift Above the Altiplano-Puna Magma Body: Evidence of a Ballooning Mid-Crustal Diapir
Y. Fialko and J. Pearse
Subsidence accompanies uplift below a massive rising magma body in the central Andes mountains.

253 Adhesion Functions in Cell Sorting by Mechanically Coupling the Cortices of Adhering Cells
J.-L. Maitre et al.
Cell adhesion provides a mechanical scaffold for cell cortex tension to drive cell sorting during zebrafish gastrulation.

257 Forces Driving Epithelial Spreading in Zebrafish Gastrulation
M. Behrndt et al.
Contraction of an actomyosin ring drives epithelial morphogenesis during embryonic development.

260 Photomechanical Responses in Drosophila Photoreceptors
R. C. Hardie and K. Franze
Light sensing involves contraction of the photoreceptor cell membrane physically gating the light-sensitive channels.

264 Bacterial Quorum Sensing and Metabolic Incentives to Cooperate
A. A. Dandekar et al.
Cooperating groups of bacteria resist infiltration by noncooperating cheats by co-regulating shared and individual products.

267 Quantifying the Impact of Human Mobility on Malaria
A. Wesolowski et al.
Geographical information in mobile phone records for 15 million Kenyans is linked to malaria prevalence estimates.

270 Preference by Association: How Memory Mechanisms in the Hippocampus Bias Decisions
G. E. Wimmer and D. Shohamy
Remembered links between objects can result in the unintentional linking of their values and can affect choices.

CONTENTS continued >>
ONLINE HIGHLIGHTS

SCIENCE SIGNALING
www.sciencesignaling.org
The Signal Transduction Knowledge Environment
9 October issue: http://scim.ag/100912

RESEARCH ARTICLE: Interferon-Induced SCYL2 Limits Release of HIV-1 by Triggering PP2A-Mediated Dephosphorylation of the Viral Protein Vpu
K. Miyakawa et al.
HIV-infected cells dephosphorylate and inactivate a viral factor to restrict viral spreading.

RESEARCH ARTICLE: Specificity of Linear Motifs That Bind to a Common Mitogen-Activated Protein Kinase Docking Groove
A. Garal et al.
Three related kinases use structural features to discriminate between potential binding partners.

PRESENTATION: Posttraumatic Stress Disorder in Children and Adolescents—Neuroendocrine Perspectives
P. Pervanidou and G. P. Chrousos
Trauma-induced changes in circulating cortisol concentrations are associated with pediatric PTSD.

PRESENTATION: Fetal Programming of Brain Development—Intrauterine Stress and Susceptibility to Psychopathology
C. Buss et al.
Intrauterine stress and maternal obesity are associated with neurodevelopmental disorders.

PODCAST
E. J. Nestler and A. M. VanHook
The neurotrophic factor BDNF has opposite effects on cocaine- and morphine-induced neuroplasticity.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists
http://scim.ag/ScienceCareers12October2012

Biomedical Consulting Agreements: The Good, the Bad, and the Ugly
E. Klees et al.
A leading attorney and a serial entrepreneur tell how to avoid potholes in agreements with industry.

Perspective: Embrace Flexible Work Arrangements
N. Pettorelli et al.
To achieve gender equality in science, shift men’s perceptions of what is professionally acceptable.

SCIENCE TRANSLATIONAL MEDICINE
www.sciencetranslationalmedicine.org
Integrating Medicine and Science
10 October issue: http://scim.ag/stm101012

RESEARCH ARTICLE: Human Neural Stem Cells Induce Functional Myelination in Mice with Severe Dysmyelination
N. Uchida et al.
Human neural stem cell transplants restore myelination in mice with a hypomyelination disorder.

NEURAL STEM CELL ENGRAFTMENT AND MYELOXATION IN THE HUMAN BRAIN
N. Gupta et al.
Neural stem cell transplantation in children with a hypomyelination disorder.

RESEARCH ARTICLE: Immunotherapy Against HPV16/18 Generates Potent T,1 and Cytotoxic Cellular Immune Responses
M. L. Bagarazzi et al.
CD8+ T cells with cytolytic activity are induced after therapeutic HPV vaccination in humans.

COMMENTARY: Revolution Stalled
S. E. Hyman
Drug discovery for psychiatric disorders is at a near standstill.

PERSPECTIVE: Next-Generation Treatments for Mental Disorders
T. R. Insel
New approaches are needed for developing next-generation treatments for mental disorders.

SCIENCE PODCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show for 12 October 2012
Listen to stories on the evolution of development, the human mutation rate, publishing patterns, and more.
Editor's Summary

This copy is for your personal, non-commercial use only.

**Article Tools**
Visit the online version of this article to access the personalization and article tools:
http://science.sciencemag.org/content/338/6104

**Permissions**
Obtain information about reproducing this article:
http://www.sciencemag.org/about/permissions.dtl