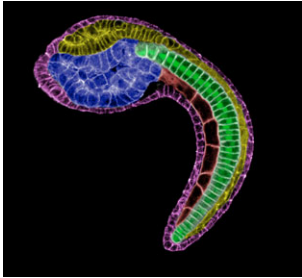
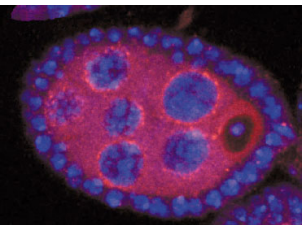


# Development



**Cover:** Oblique lateral confocal section through a mid-tailbud stage ascidian (*Ciona savignyi*) embryo. The 40 notochord cells (green) were marked with a stable *brachyury:GFP* transgene. Cell peripheries were labelled with phalloidin and manually pseudocolored to show the endoderm (blue), muscle (red), neural tube (yellow) and epidermis (magenta). **See research article by Veeman et al. on p. 33.**



Recent studies in flies, fish and mice implicate a new class of small RNAs, piRNAs, in germline development and germline DNA integrity. However, as Carla Klattenhoff and William Theurkauf discuss, whether piRNAs primarily control chromatin organization, gene transcription, RNA stability or RNA translation is poorly understood, as is their biogenesis, raising many unanswered questions about these intriguing RNAs. **See review on p. 3.**

## EDITORIAL

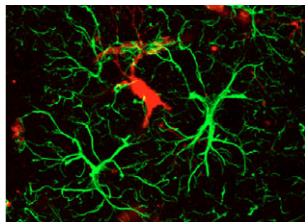
- 1** Whither *Development* and developmental biology?  
Smith, J. and Alfred, J.

## REVIEW

- 3** Biogenesis and germline functions of piRNAs  
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- 11** Par-complex proteins promote proliferative progenitor divisions in the developing mouse cerebral cortex  
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- 23** Differential transmission of MEKK1 morphogenetic signals by JNK1 and JNK2  
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- 33** *chongmague* reveals an essential role for laminin-mediated boundary formation in chordate convergence and extension movements  
Veeman, M. T., Nakatani, Y., Hendrickson, C., Ericson, V., Lin, C. and Smith, W. C.
- 43** The E1 ubiquitin-activating enzyme Uba1 in *Drosophila* controls apoptosis autonomously and tissue growth non-autonomously  
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- 53** Sisyphus, the *Drosophila* myosin XV homolog, traffics within filopodia transporting key sensory and adhesion cargos  
Liu, R., Woolner, S., Johndrow, J. E., Metzger, D., Flores, A. and Parkhurst, S. M.
- 65** Chromatin assembly factor 1 regulates the cell cycle but not cell fate during male gametogenesis in *Arabidopsis thaliana*  
Chen, Z., Tan, J. L. H., Ingouff, M., Sundaresan, V. and Berger, F.
- 75** Calcium fluxes in dorsal forerunner cells antagonize  $\beta$ -catenin and alter left-right patterning  
Schneider, I., Houston, D. W., Rebagliati, M. R. and Slusarski, D. C.
- 85** Wnt3a/ $\beta$ -catenin signaling controls posterior body development by coordinating mesoderm formation and segmentation  
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- 95** Matrix metalloproteinases promote motor axon fasciculation in the *Drosophila* embryo  
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- 111** Oocyte regulation of metabolic cooperativity between mouse cumulus cells and oocytes: BMP15 and GDF9 control cholesterol biosynthesis in cumulus cells  
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- 123** A novel promoter-tethering element regulates enhancer-driven gene expression at the bithorax complex in the *Drosophila* embryo  
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- 133** A stem-loop structure in the *wingless* transcript defines a consensus motif for apical RNA transport  
dos Santos, G., Simmonds, A. J. and Krause, H. M.



Cellular localisation of DsRed in coronal sections of P30 NG2DsRedBAC transgenic mouse cerebral cortex. DsRed fluorescence is not detected in astrocytes expressing GFAP. NG2DsRedBAC mice, which express DsRed specifically in NG2+ cells, reveal that NG2+ cells give rise to both protoplasmic astrocytes and oligodendrocytes. **See research article on p. 145.**

- 145** NG2 cells generate both oligodendrocytes and gray matter astrocytes  
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- 159** Insertional mutagenesis by the *Tol2* transposon-mediated enhancer trap approach generated mutations in two developmental genes: *tcf7* and *synembryn-like*  
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- 171** Hoxc10 and Hoxd10 regulate mouse columnar, divisional and motor pool identity of lumbar motoneurons  
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- 183** Regulated addition of new myocardial and epicardial cells fosters homeostatic cardiac growth and maintenance in adult zebrafish  
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