### Tbx6-dependent Sox2 Regulation Determines Neural or Mesodermal Fate in the Axial Stem Cells

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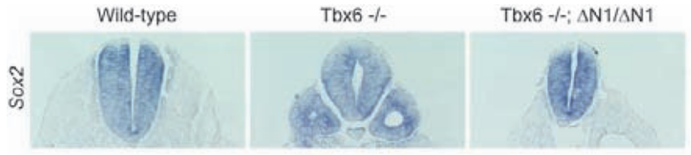
***Nature,* 470,** 394-398 (2011)

The textbook view holds that segregation of the three germ layers (ectoderm, mesoderm, endoderm) is the process specifying cell lineages in early embryos. This present study challenges this, by showing that paraxial mesoderm (which gives muscle and bone) and neural plate (forerunner of the CNS) are in fact derived from common stem cell-like precursors. This requires Tbx6 (a mesoderm-dedicated regulator) to turn off Sox2 (a neural regulator). Cell type specification is therefore separate from germ layer formation. These findings will impact on contemporary stem cell research, where the regulation of cell lineage specification is the major issue.




### Laser-induced Propagation and Destruction of Amyloid βFibrils

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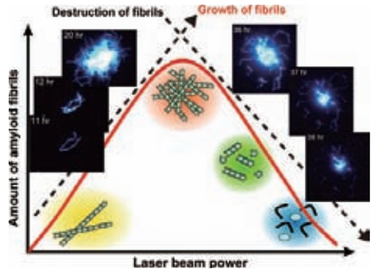
***The Journal of Biological Chemistry,* 285,** 19660-19667 (2010)

The amyloid deposition of amyloid β(Aβ) peptides is a critical pathological event in Alzheimer's disease (AD). Preventing the formation of amyloid deposits and removing preformed fibrils in tissues are important therapeutic strategies against AD. We studied the effects of a laser beam on Aβ fibrils. The extensive laser irradiation destroyed the preformed Aβ fibrils. However, irradiation during spontaneous fibril formation resulted in only the partial destruction of growing fibrils and a subsequent explosive propagation of fibrils. The explosive propagation was caused by an increase in the number of active ends due to breakage. The results not only reveal a case of fragmentation- induced propagation of fibrils but also provide insights into therapeutic strategies for AD.




### Induction of Type I Interferon by Adenovirus-encoded Small RNAs

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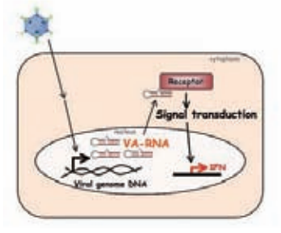
***Proceedings of the National Academy of Sciences of the United States of America,* 107,** 17286-17291 (2010)

Transduction with adenovirus (Ad) vectors results in a rapid activation of innate immune responses such as inflammatory cytokine production and subsequent tissue damage. The precise mechanisms of the innate immune responses induced by Ad vectors remain to be clarified. In the present study, we demonstrated that Ad-encoded small RNAs, virus-associated RNAs (VA-RNAs), induce the production of type I interferon (IFN), but they do not induce the production of inflammatory cytokines, in mouse embryonic fibroblasts (MEFs). We also show that IFN-β promoter stimulator (IPS)-1 is involved in VA-RNAs-dependent IFN-β production in MEFs and is partially involved in type I IFN production in DCs. This study provides important insight into the mechanisms of Ad vector-triggered innate immune responses, which may lead to more advanced and rational Ad vector designs for gene therapies and vaccine applications.





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