

# SOX10

## Expression Pattern

### Human

Northern blot analysis of human *SOX10* showed **strong expression in fetal brain, and in adult heart, brain, small intestine, and colon; weaker expression was seen in prostate and testis** ([Pusch et al., 1998](#)).

Northern blotting and in situ hybridization analysis of 4-6 week old human embryos showed *SOX10* expression in neural crest cells and the derivatives that differentiate into the peripheral nervous system. The authors noted that human and rodent *Sox10* expression patterns differ: **human *SOX10* is expressed in cephalic mesectoderm that develops into cartilaginous portions of nasal bones while murine *Sox10* is not; human *SOX10* is expressed in adult heart, prostate, and testis; and also noted more widespread expression of human *SOX10* in the central nervous system relative to mouse, as human adult brain shows neuronal *SOX10* expression** ([Bondurand et al., 1998](#)).

Northern blot analysis showed the following: **murine *Sox10* expression in heart, brain, lung, skeletal muscle, and testes, as well as embryonic expression from 11-17 dpc; human *SOX10* expression in heart, brain, skeletal muscle, testes, pancreas, prostate, ovary, stomach, spinal cord, trachea, adrenal gland, stomach, small intestine, and colon** ([Southard-Smith et al., 1999](#)).

Western blot analysis found that human **SOX10 is not expressed in the hair bulb, but SOX10 expression is seen in the epidermis, hair follicle melanocytes, and neonatal human melanocytes** ([Commo et al., 2004](#)).

***Sox10* mRNA expression was shown in both male and female developing gonads at E10.5, and later both *Sox10* mRNA and SOX10 protein was specifically localized in the Sertoli cells of the testis; *Sox10* mRNA expression in testis was quantitatively less than that of *Sox8* or *Sox9*** ([Polanco et al., 2010](#)).

Using immunohistochemistry, early human embryos at Carnegie stages (CS) 12-18 were analyzed in detail for the expression of the neural crest gene regulatory network proteins SOX9, SOX10, PAX3, PAX7, HNK1, AP2Alpha, MSX1/2, and P75NTR. **SOX10 expression was seen in both premigratory (as early as CS12) and migrating neural crest cells, correlating well with SOX10 expression patterns seen in chick and mouse model organisms.** The migrating human neural crest populations expressing SOX10 include dorsal root ganglia, enteric ganglia, presumptive melanoblasts, cranial ganglia, maxillary process, and otic vesicle. SOX10 expression was also seen in the ventricular zone of the neuroepithelium (weak), and in vertebrae and rib cartilage primordia, all tissues not derived from neural crest ([Betters et al., 2010](#)).

### Mouse

Embryonic in situ hybridization detected ***Sox10* expression in putative melanoblasts as well as sympathetic, enteric, cranial, and dorsal root ganglia** ([Southard-Smith et al., 1998](#)).

Detailed whole mount in situ hybridization showed mouse *Sox10* expression in the **developing peripheral nervous system and otic vesicle** from E9.5-E11.5. ***Sox10* expression lessens as the embryos grow, but persists in anterior structures that are still differentiating** ([Pusch et al., 1998](#)).

Extensive analysis of *Sox10* expression, including expression in the CNS, was performed along with

functional characterization of SOX10 in glial cells ([Kuhlbrodt et al., 1998a](#)).

Northern blot analysis showed *Sox10* mRNA expression in **adult mouse heart, brain, lung, skeletal muscle, and testes** ([Southard-Smith et al., 1999](#)).

**Detailed in situ hybridization of developing and adult mouse ear showed that *Sox10* expression decreases as embryonic development progresses.** *Sox10* mRNA expression is seen in the developing ear as follows: E11.5, entire otic vesicle epithelium; E13.5, the primordial epithelia of the cochlea and the saccule; E16.5, cochlear epithelium and the saccule, utricle, and semicircular canals of the vestibular system; postnatally and into adulthood, supporting cells of the organ of Corti. The authors also note that migrating neural crest-derived melanoblasts enter the lateral wall of the cochlear duct, and later develop into intermediate cells of the stria vascularis ([Watanabe et al., 2000](#)).

Targeted deletion of *Sox10* by insertion of the *LacZ* gene generated transgenic mice with a disrupted copy of endogenous *Sox10*. These *Sox10<sup>LacZ</sup>* mice express **-gal in regions where *Sox10* is normally expressed** during development, including melanoblasts ([Britsch et al., 2001](#)).

Construction of a *Sox10* transgenic mouse (which did not disrupt the endogenous *Sox10* locus; *Sox10<sup>GeoBAC</sup>*) revealed ***Sox10* expression in the peripheral nervous system of the developing heart, lungs, pancreas, arteries, and intestinal tract.** Expression was also seen in adrenal gland, salivary glands, and lacrimal glands ([Deal et al., 2006](#)).

Detailed **expression of *Sox10* in the mouse inner ear** was described ([Breuskin et al., 2009](#)).

## MGI expression database links

Data summary: Data summary page for all *Sox10* expression data at the Mouse Genome Informatics (MGI) website.

Assays: MGI index of published assays containing murine *Sox10* expression data.

Images: MGI index of published images of murine *Sox10* expression patterns.