

Repressor element-1 silencing transcription/neuron-restrictive silencer factor is required for neural sodium channel expression during development of *Xenopus*

Armisen, Ricardo

Fuentes, Rómulo

Olguin, Patricio

Cabrejos, María E.

Kukuljan, Manuel

The ability of neurons to fire rapid action potential relies on the expression of voltage-gated sodium channels; the onset of the transcription of genes that encode these channels occurs during early neuronal development. The factors that direct and regulate the specific expression of ion channels are not well understood. Repressor element-1 silencing transcription/ neuron-restrictive silencer factor (REST/NRSF) is a transcriptional regulator characterized as a repressor of the expression of NaV1.2, the gene encoding the voltage-gated sodium channel most abundantly expressed in the CNS, as well as of the expression of numerous other neuronal genes. In mammals, REST/NRSF is expressed mostly in non-neural cell types and immature neurons, and it is downregulated on neural maturation. To understand the mechanisms that govern sodium channel gene transcription and to explore the role of REST/NRSF in vivo, we inhibited REST/NRSF action in developing *Xenopus laevis* embryos by means of a domina