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Data Article

Data describing Rax positive optic-vesicle generation from mouse embryonic stem cells *in vitro*

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Embryonic stem cell
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Chemical compounds studied in this article:
CHIR99021 (PubChem CID: 9956119)
1-Thioglycerol (PubChem CID: 7291)
Taurin (PubChem CID: 211707)
Retinoic Acid (PubChem CID: 444795)

ABSTRACT

This article contains data related to the research article entitled "Specification of embryonic stem cell-derived tissues into eye fields by Wnt signaling using rostral diencephalic tissue-inducing culture" Sakakura (2016) [1]. Mouse embryonic stem cells (ESC) were used for the generation of optic vesicle-like tissues *in vitro*. In this article we described data in which a Rax::GFP knock-in ESC line was used to monitor the formation of optic tissues. In addition, we also described the data of regional marker expression of Rax, Sox2 and Pax6 *in vivo* around the forebrain and the eye tissues for comparative purposes. These data can be valuable to researchers interested in investigating forebrain and eye tissue development.

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Specifications Table

Subject area	Biology
More specific subject area	Stem cell biology, Developmental biology, Regenerative medicine
Types of data	Image, graph, schematic diagram
How data was acquired	Inverted fluorescent microscope (fluorescent, bright-field) and Fluorescence-activated cell sorting (FACS) analysis
Data format	Raw, analyzed
Experimental factors	Mouse embryonic stem cells (ESCs) were differentiated into optic tissues *in vitro*
Experimental features	A chemical inhibitor, CHIR99021 (CHIR), which inhibits GSK-3ß, was applied for the generation of optic tissues in a three-dimensional manner using a chemically defined medium (CDM) and matrigel (MG).
Data source location	Laboratory for *in vitro* Histogenesis, RIKEN Center for Developmental Biology. Center for Vascular and Developmental Biology, Feinberg Cardiovascular Research Institute, Northwestern University Feinberg School of Medicine.
Data accessibility	Supplementary data of the article

Value of the data

- The expression pattern of Sox2, Pax6 and Rax provides the characterization of ESC-derived tissues for regional identification of neural tissues.
- The data and diagram for the timed-addition of reagents into the differentiation media may assist the readers in readily using the *in vitro* system for inducing optic tissues from ESCs.
- A data of the ESC-derived Rax positive tissues from culture day 4 to day 24 may give better information of the ESC differentiation culture for researchers in the related fields.

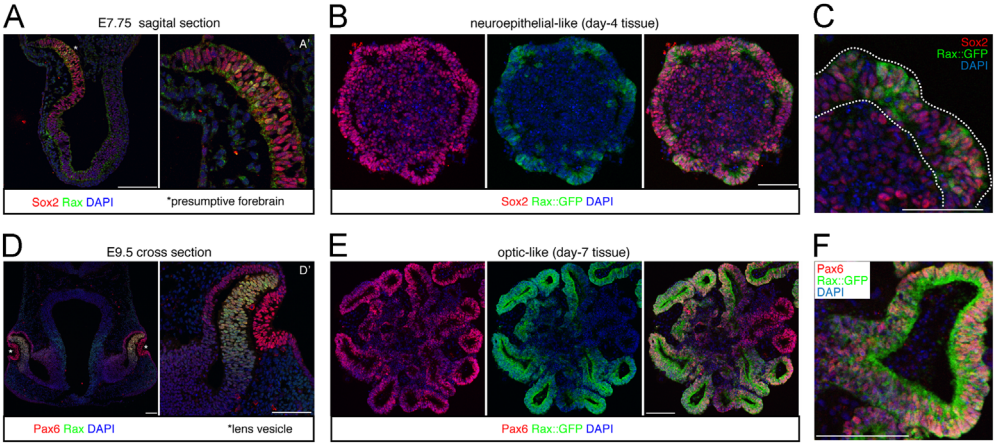

Fig. 1. Comparison between *in vivo* and *in vitro* marker gene expression in the neuroepithelium and optic tissues. (A, B, C) E7.75 embryo and day-4 ESC-derived tissues show Sox2, Rax and Rax::GFP signals via immunostaining. Image B and C are prior to CHIR addition. Image A′ is a high magnification of the forebrain region in Image A. Dotted lines in image C indicate epithelial-like structures. (D, E, F) E9.5 embryo and day-7 ESC-derived tissues in CDM/MG/CHIR condition show Pax6, Rax and Rax::GFP signals via immunostaining. Image D' is a high magnification of the eye region in image D. Scale bars; 100 μm.