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Adult Neurogenesis in Three Sites of the Ventricular Wall of the Olfactory Bulb of *Austrolebias sp.*

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The Olfactory Bulb (OB) of *Austrolebias sp* has three neurogenic proliferative regions differentiable by their cellular composition [1]. It is know that social and reproductive activity modulates adult neurogenesis, increasing the proliferation of neuronal progenitors and incorporating new neurons into functional circuits [2]. Our objective was to evaluate whether the different populations of progenitor/stem cells located in the OB could constitute different neurogenic niches that support the growth and functional demands of the olfactory system. By immunohistochemistry, we studied space-time cell proliferation and migration using the DNA synthesis markers (Bromo-, Chloro-, Iodo-deoxyuridine) together with specific markers for glia (BLBP and Vimentin); neurons (HuC) and transcription factors (Pax6, Sox2). As a result, we identified the main cell types reported for neurogenic niches analogous to other vertebrates in three regions with abundant cell proliferation and migration; the transitional region OB-Telencephalon 1, medial region 2 and the ventral region 3 [3]. Cells in region 1 migrate bidirectional to the rostral portion of the OB and to the caudal portion of the Telencephalon. On the other hand in region 3, the cells migrate towards the rostral portion of the OB similar to the path of the rostral migratory band reported in mammals. We identified BrdU+ cells in three neurogenic places 1,2,3 shown in Figure 1A, and chains of neuroblast HuC+ adjacent to large blood vessels that migrate using them as scaffold (Figure. 1B). Region 2 showed few non-migrating proliferating cells, IdU/CldU proposed as candidates for stem cells, as well as newly generated neurons. The characteristics of this area suggest that the medial areas contribute to the growth of the ventricular wall. By SEM, we observed monociliate cells with different characteristics according to the region analyzed at OB the dwarf cilia and the long cilia at the Telencephalon. In summary, the three neurogenic niches could serve to different functional purposes [4].

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[3] C. Lois et al. Science (264) (1994), p. 1145.
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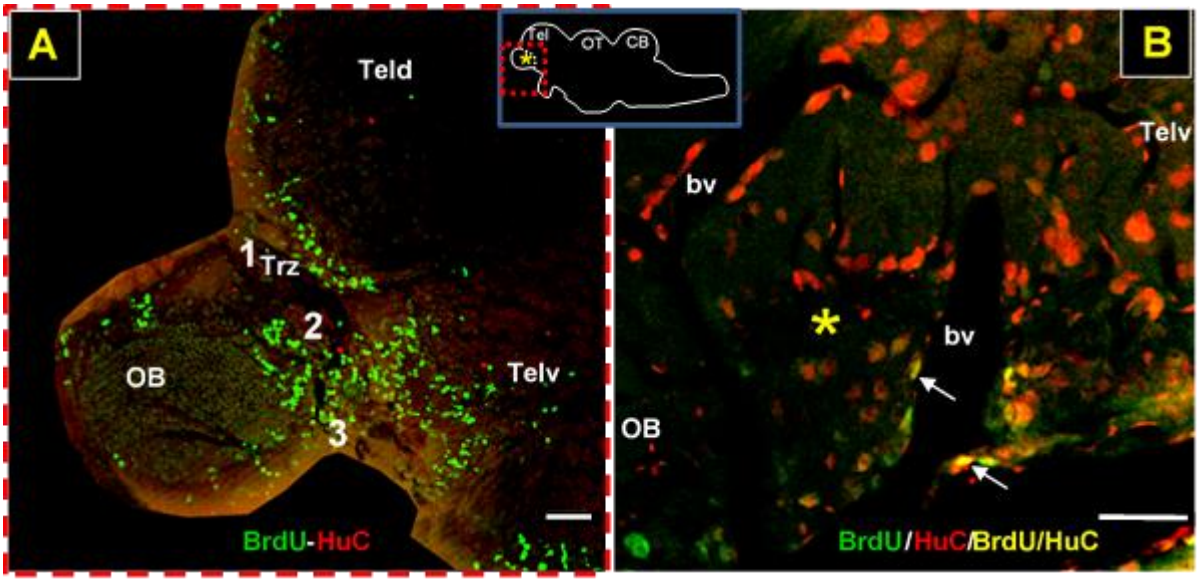

Figure 1. Confocal images of the ventral zone of the Olfactory Bulb of *Austrolebias charrua* fishes in a parasagittal view. **A)** The image shows BrdU+ proliferative cells located in the transition zone of the Olfactory bulb-Telencephalon. **B)** Some new BrdU/HuC+ neurons make up the rostral migratory stream and are located adjacent to blood vessels (White arrows). The yellow asterisk corresponds to the Transition zone between Olfactory Bulb-Telencephalon ventral indicated in the drawing above.
OB: Olfactory bulb; Trz: Transition zone; Teld: Telencephalon Dorsal; Telv: Ventral Telencephalon; OT: Optic tectum; CB: Cerebellum; bv: Blood vessel. Scale bars A,B=50 µm

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