



## Fig S6

Confocal time-lapse of memb-RFP+ WT cells transplanted into an EphA4MO pGFP5.3 host embryos (GFP in r3, r5, midbrain/hindbrain boundary, and otic placodes/vesicles), showing that donor cells divide with similar timing irrespective of rhombomere location. Dorsal views with anterior to the right. Transient cell rounding, a precursor to cell division, is observed in neural progenitors throughout the hindbrain at neural keel stages. (A,B) Representative confocal sections of the zebrafish hindbrain are shown starting at 13hpf or 14hpf, respectively, and every 15-45' thereafter. Cells about to undergo division in r3 or r5 are marked by yellow asterisks, their daughters are marked with yellow dots, and the most medial extension of the dividing mother or the more medial daughter is indicated by a yellow arrowhead. Cells are similarly annotated in purple in other rhombomeres. During the 75-90' time period shown, several cell divisions were completed in r3 and r5. Daughter cells from these divisions were not observed crossing the midline, although 1-2h after division, many daughter cells either disappeared from the plane of focus or could not be unambiguously distinguished and therefore we were unable to determine their final locations. At the same time, neural progenitors divided in other rhombomeres and frequently the more medial daughter extended a projection toward the other side of the hindbrain, most often reaching at least halfway across to the other side within 90' after division. Scale bar: 50 $\mu$ m.