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### **Absence of functional GABAA receptors in transit-amplifying stem cells of the early postnatal subventricular zone**

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In the subventricular zone (SVZ) neurogenesis is regulated by the coordinated proliferation and differentiation of different precursor types: slowly proliferating type B cells, rapidly dividing transit-amplifying type C cells and type A neuroblasts. Previous evidence suggests that g-aminobutyric acid (GABA) released by neuroblasts provides a feedback signal inhibiting the proliferation of type A and B cells by activation of GABAA receptors, while the effects of GABA on type C cells are unknown. Here we used levels of EGFR expression and lineage specific markers to purify stem cells and neuroblasts from the postnatal SVZ. Clonal assays and analysis of mice lacking expression of orphan receptor Tlx antigen showed that cells expressing high levels of EGFR (EGFR<sup>high</sup>) directly correlated with stem cell activity *in vitro* and *in vivo*. Analysis of antigen expression and BrdU incorporation *in vivo* revealed that more than 80% of the isolated cells represented putative type C cells. Although isolated EGFR<sup>high</sup> cells and neuroblasts were both PSANCAM positive, they displayed profound functional differences. Neuroblasts but not stem cells expressed GABA and Doublecortin

and showed a fast intracellular Ca<sup>2+</sup> increase upon acute membrane depolarization or application of GABA. Electrophysiological measurements also revealed different passive membrane properties and resting potentials in the two cell populations. Neuroblasts and stem cells both showed TEA-sensitive outwardly rectifying K<sup>+</sup> currents, but at different current densities. Strikingly, only neuroblasts expressed voltage-activated Ca<sup>2+</sup> channels and displayed GABAA receptors mediated Cl<sup>-</sup> currents. Furthermore, selective activation of GABAA and GABAB receptors did not affect stem cells clone forming capability nor their *in vitro* proliferation rate. Thus, transit-amplifying stem cells derived from the early postnatal SVZ do not express functional GABAA receptors and GABA does not directly modulate their proliferation.