ABSTRACT

Embryonic stem (ES) cells can differentiate into many specialized cell types, including neural cells. Numerous induction protocols have been developed to direct their differentiation. Our lab created an in vitro neural stem cell (NSC) niche through the induction of 129 derived B5 ES cells. Subsequent attempts using the established in vitro NSC niche protocol on the B6 ES cell line (derived from the C57BL/6 mouse strain) were unsuccessful. I proceeded to characterize the B6 ES cell line. B6 embryonic stem cells grew significantly slower than B5 ES cells under similar conditions. After application of the 4–/4+ retinoic acid (RA) neural induction protocol, B6 embryoid bodies (EBs) displayed a neural rosette-like morphology. Immunohistochemical labeling of the Day 8 EBs revealed a labeling pattern that suggests the EBs may be recapitulating the inside-out formation of cortical development in mammals. When dissociated Day 8 B6 EB cells were transplanted into the left striatum of syngeneic C57BL/6 mice, teratomas formed. The slow growth rate of B6 cells may have contributed to their incomplete neuralization, and to achieve a more complete neural induction, a modified RA induction protocol should be considered for use in future studies.