Public Abstract
First Name:Cheryl
Middle Name:Lynn
Last Name:Dunham
Adviser's First Name:Mark
Adviser's Last Name:Kirk
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term:FS 2011
Department:Biological Sciences
Degree:MA
Title:Teratoma formation by neuralized C57BL/6J-eGFP mouse embryonic stem cells after syngeneic transplantation into the midbrain

Embryonic stem (ES) cells are a type of unspecialized cell that can both divide to form more of its own cell type, and change to form all the cell types of the body. One area of interest for ES cell-based regenerative therapies concerns neurodegenerative disorders, such as Parkinsonâ€™s disease. Many protocols have been developed to direct their division. Our lab successfully used a neural induction protocol to direct ES cells to divide into specific neural cell types on B5 ES cells (derived from the 129 mouse strain) and I proceeded to characterize the response of B6 ES cells (derived from the C57BL/6 mouse strain) to the same protocol.

These ES cells grow significantly slower than the B5 ES cells. When subjected to the neural induction protocol, they formed embryoid bodies (EBs, spherical aggregates of cells that look similar to the early embryo) containing a rosette-like arrangement of specific neural cell types. Based on these findings, the EBs may represent a model for early neural development, and research on them could further our understanding of this process.

Cells from the EBs formed teratomas when injected into the brain of strain-typed mice. The teratomas formed from EB cells were much smaller than teratomas formed from the original, unchanged, ES cells, suggesting the EB cells were at least partially converted into neural cell types. The slow growth rate of B6 ES cells may have contributed to their incomplete neuralization, and to achieve a more complete neural induction, a modified protocol should be considered.