CLAIMS

1. A method of generating ventralized spinal neural progenitor cells (spNPCs) comprising:

providing induced pluripotent stem cells (iPSCs);

differentiating iPSCs into neural ectodermal cells by culturing in neural induction media; and

dissociating neural ectodermal cells, replating on a cell culture substrate and further culturing the replated neural ectodermal cells in differentiation media to generate ventralized spNPCs;

in which the differentiation media comprises either B27 media with retinoic acid, and SAG, or Non-B27 media with ascorbic acid, retinoic acid, and SAG.

2. A method according to Claim 1, in which the iPSCs are cultured in neural induction media for a period of 5-7 days.

3. A method according to Claim 1, in which the replated neural ectodermal cells are cultured in differentiation media for a period of 5-7 days.

4. A method according to Claim 1, in which the neural induction media comprises one or more of: LDN193189, SB431542, and CHIR99021.

5. A method according to Claim 1, in which the cell culture substrate is matrigel.

6. A method according to Claim 1, further comprising freezing the spNPCs.

7. A cryopreserved solution of spNPCs made by a method according to Claim 6.

8. A method of generating ventralized spinal neural progenitor cells (spNPCs) comprising:

providing induced pluripotent stem cells (iPSCs);

differentiating iPSCs into neural ectodermal cells by culturing in neural induction media for 6 days; and

dissociating neural ectodermal cells, replating on a cell culture substrate and further culturing the replated neural ectodermal cells in differentiation media for 6 days to generate ventralized spNPCs;

in which the differentiation media comprises either B27 media with retinoic acid, and SAG, or Non-B27 media with ascorbic acid, retinoic acid, and SAG.

9. A method according to Claim 8, in which the neural induction media, differentiation media, or both, comprise a supplement comprising:

Albumin, Bovine Serum, Sodium Bicarbonate, L-Ascorbic Acid,

Putrescine, D(+)-Galactose, Holo-transferrin, Catalase, L-Carnitine, Glutathione (reduced),

Sodium Selenite, Ethanolamine, and T3 (triiodo-L-thyronine); and

Corticosterone, Linoleic Acid, Linolenic Acid, Lipoic Acid (thioctic acid), Progesterone, Retinol Acetate, a-Tocopherol (vitamin E), and a-Tocopherol acetate.

10. A method according to Claim 8, in which the neural induction media comprises one or more of: LDN193189, SB431542, and CHIR99021.

11. A method according to Claim 8, in which the cell culture substrate is matrigel.

12. A quantity of spNPCs made by a method according to Claim 8.

13. A method according to Claim 8, further comprising freezing the spNPCs.

14. A cryopreserved solution of spNPCs made by a method according to Claim 13.