WHAT IS CLAIMED IS:

1. An *in vitro* method for inducing differentiation of stem cells, comprising:

contacting the stem cells with at least one inhibitor of Small Mothers Against Decapentaplegic (SMAD) signaling, at least one activator of Sonic hedgehog (SHH) signaling, and at least one activator of wingless (Wnt) signaling; and

contacting the cells with at least one activator of fibroblast growth factor (FGF) signaling and at least one inhibitor of Wnt signaling to obtain a population of differentiated cells expressing at least one marker indicating a midbrain dopamine neuron or a precursor thereof;

wherein the at least one marker indicating a midbrain dopamine neuron or a precursor thereof is selected from the group consisting of EN1, OTX2, TH, NURR1, FOXA2, PITX3, LMX1A, LMO3, SNCA, ADCAP1, CHRNA4, SOX6, DAT, VMAT2, WNT1, GIRK2, and combinations thereof;

wherein the stem cells are selected from the group consisting of pluripotent stem cells, nonembryonic stem cells, embryonic stem cells, induced pluripotent stem cells, and combinations thereof.

2. The method of claim 1, wherein the contact of the cells with the at least one inhibitor of Wnt signaling is initiated about 5 days to about 15 days from the initial contact of the stem cells with the at least one inhibitor of SMAD signaling; wherein the cells are contacted with the at least one inhibitor of Wnt signaling for about 1 day to about 30 days.

3. The method of claim 1 or 2, wherein the contact of the cells with the at least one activator of FGF signaling is initiated about 5 days to about 20 days from the initial contact of the cells with the at least one inhibitor of SMAD signaling; wherein the cells are contacted with the at least one activator of FGF signaling for at least about 1 day and/or for up to about 20 days; at least about 3 days and/or for up to about 10 days; or at least 4 days and/or for up to 7 days.

4. The method of any one of claims 1-3, wherein the cells are contacted with the at least one inhibitor of SMAD signaling for about 5 days to about 7 days.

5. The method of any one of claims 1-4, wherein the cells are contacted with the at least one activator of SHH signaling for about 5 days to about 7 days.

6. The method of any one of claims 1-5, wherein the cells are contacted with the at least one activator of Wnt signaling for about 15 days to about 17 days.

7. The method of any one of claims 1-6, wherein the concentration of the at least one activator of Wnt signaling is increased about 4 days from its initial contact with the stem cells.

8. The method of claim 7, wherein the concentration of the at least one activator of Wnt signaling is increased by between about 200 % and about 1000 % from the initial concentration of the at least one activator of Wnt signaling.

9. The method of claim 7 or 8, wherein the concentration of the at least one activator of Wnt signaling is increased to from about 1 μM to between about 5 μM and about 10 μM.

10. The method of any one of claims 1-9, wherein the at least one inhibitor of Wnt signaling is selected from the group consisting of IWP2, IWR1-endo, XAV939, IWP-O1, Wnt-C59, IWP-L6, and ICG-001, and combinations thereof.

11. The method of any one of claims 1-10, wherein the at least one activator of FGF signaling is selected from the group consisting of FGF18, FGF17, FGF8a, FGF8b, FGF4, FGF2, and combination thereof.

12. The method of any one of claims 1-11, wherein the at least one inhibitor of SMAD signaling comprises an inhibitor of TGFβ/Activin-Nodal signaling, an inhibitor of bone morphogenetic protein (BMP) signaling, or a combination thereof; wherein the at least one inhibitor of TGFβ/Activin-Nodal signaling is selected from the group consisting of SB431542, A83-01, derivatives of SB431542, and combinations thereof; wherein the at least one inhibitor of BMP signaling is selected from the group consisting of LDN193189, Noggin, dorsomorphin, derivatives of LDN193189, derivatives of Noggin, derivatives of dorsomorphin, and combinations thereof.

13. The method of any one of claims 1-12, wherein the at least one activator of Wnt signaling is selected from the group consisting of CHIR99021, CHIR98014, AMBMP hydrochloride, LP 922056, Lithium, deoxycholic acid, BIO, SB-216763, Wnt3A, Wnt1, Wnt5a, derivatives thereof, and combinations thereof.

14. The method of any one of claims 1-13, wherein the at least one activator of SHH signaling is selected from the group consisting of SHH proteins, recombinant SHHs, modified N-terminal SHHs, SHH C25II, Smoothened agonists (SAG), purmorphamine, and combinations thereof.

15. The method of any one of claims 1-14, wherein at least about 80% of the differentiated cells express FOXA2 and EN1 about 15 days from the initial contact of the stem cells with the at least one inhibitor of SMAD signaling.

16. The method of any one of claims 1-15, further comprising isolating cells that express at least one positive surface marker and do not express at least one negative surface marker; wherein the at least one positive surface marker is selected from the group consisting of CD171, CD184, and combinations thereof; and wherein the at least one negative surface marker is selected from CD49e, CD99, CD340, and combinations thereof.

17. A cell population of *in vitro* differentiated cells, wherein the *in vitro* differentiated cells are obtained by a method of any one of claims 1-16.

18. A composition comprising the cell population of claim 17.

19. The composition of claim 18, which is a pharmaceutical composition further comprising a pharmaceutically acceptable carrier.

20. A kit for inducing differentiation of stem cells to midbrain dopamine neurons or precursors thereof, comprising:

(a) at least one inhibitor of SMAD signaling;

(b) at least one activator of SHH signaling;

(c) at least one activator of Wnt signaling;

(d) at least one inhibitor of Wnt signaling;

(e) at least one activator of FGF signaling; and

(f) instructions for inducing differentiation of the stem cells into a population of differentiated cells that express at least one marker indicating a midbrain dopamine neuron or a precursor thereof.