WHAT IS CLAIMED IS:

1. An isolated cell population produced by:

harvesting human retinal tissue at a stage after which the retina is formed but before photoreceptor outer segments are fully formed throughout the retina and before retinal vascularization substantially completed or completed, wherein the tissues are harvested from a human retina at a gestational age between about 12 weeks to about 28 weeks;

dissociating the harvested tissues mechanically and enzymatically to generate a dissociated suspension of cells and cell clusters; and

culturing the dissociated suspension of cells at atmospheric oxygen level or at low oxygen conditions that mimic oxygen levels of a developing fetal retina during gestation, or under hypoxic conditions, in serum free culture medium in culture flasks or plates coated with a xeno-free fibronectin, an ornithine, a polylysine, a laminin, or an equivalent thereof, for about 10 to 30 passages:

wherein after the culturing the human retinal progenitor cells express one or more markers selected from the group consisting of nestin, Sox2, Ki-67, MHC Class I, and Fas/CD95,

wherein nestin is expressed by greater than 90% of the cells in the population,

wherein Sox2 is expressed by greater than 80% of the cells in the population,

wherein Ki-67 is expressed by greater than 30% of the cells in the population,

wherein MHC Class I is expressed by greater than 70% of the cells in the population,

and wherein Fas/CD95 is expressed by greater than 30% of the cells in the population,

thereby making an isolated cell population wherein cells in the population express one or more markers selected from the group consisting of nestin, Sox2, Ki-67, MHC Class I, and Fas/CD95.

2. The isolated cell population of claim 1, wherein the cells in the population further express one or more markers selected from the group consisting of vimentin, CD9, CD81, AQP4, CXCR4, CD15/LeX/SSEA1, GD2 ganglioside, CD133, β3-tubulin, MAP2, GFAP, OPN/SPP1, PTN, KDR, and TEK.

3. The isolated cell population of claim 1, wherein the enzymatic dissociating comprises trypsin.

4. The isolated cell population of claim 1, wherein the xeno-free fibronectin comprises human plasma fibronectin.

5. The isolated cell population of claim 1, wherein the isolated cell population is cryopreserved.

6. The isolated cell population of claim 1, wherein the cells in the isolated cell population express on their surface a Sox2, a Ki-67, an MHC Class I, and a Fas/CD95.

7. The isolated population of claim 1, wherein the low oxygen conditions that mimic oxygen levels of a developing fetal retina during gestation is about 3% oxygen.

WHAT IS CLAIMED IS:

1. A formulation, product of manufacture or composition for use in a subject:

as a medicament,

useful in the treatment of a retinal disease or condition,

wherein the formulation, product of manufacture or composition comprises a cell population comprising non-immortal human retinal progenitor cells, wherein the formulation is made by

mechanically and/or enzymatically digesting an obtained sample of human retinal tissue from a human at about 12 weeks to about 28 weeks gestational age to generate a dissociated suspension of cells and cell clusters; and

culturing the suspension in serum-free media in culture flasks or plates coated with a xeno-free fibronectin, an ornithine, a polylysine, a laminin, or a Matrigel™ for between about 10 and 30 passages,

wherein the cells are passaged at between 40% to 90% confluence and treated with an enzyme at each passage to dissociate the cells and adding fresh culture media supplemented with between 0.01 mg/ml and 0.5 mg/ml vitamin C every 1 to 2 days,

thereby making non-immortal human retinal progenitor cells, wherein the non-immortal human retinal progenitor cells express one or more markers selected from the group consisting of nestin, Sox2, Ki-67, MHC Class I, and Fas/CD95, wherein nestin is expressed by greater than 90% of the cells in the population, wherein Sox2 is expressed by greater than 80% of the cells in the population, wherein Ki-67 is expressed by greater than 30% of the cells in the population, wherein MHC Class I is expressed by greater than 70% of the cells in the population, and wherein Fas/CD95 is expressed by greater than 30% of the cells in the population.

2. The formulation, product of manufacture or composition for use of claim 1 wherein the subject is a human.

3. The formulation, product of manufacture or composition for use according to claim 1 or claim 2, wherein the composition is formulated for injection into a vitreous cavity or a subretinal space of the subject.

4. The formulation, product of manufacture or composition for use according to any one of the preceding claims, wherein the retinal disease or condition comprises retinitis pigmentosa (RP), Leber's congenital amaurosis (LCA), Stargardt disease, Usher's

syndrome, choroideremia, a rod-cone or cone-rod dystrophy, a ciliopathy, a mitochondrial disorder, progressive retinal atrophy, a degenerative retinal disease, age related macular degeneration (AMD), wet AMD, dry AMD, geographic atrophy, a familial or acquired maculopathy, a retinal photoreceptor disease, a retinal pigment epithelial-based disease, diabetic retinopathy, cystoid macular edema, uveitis, retinal detachment, traumatic retinal injury, iatrogenic retinal injury, macular holes, macular telangiectasia, a ganglion cell disease, an optic nerve cell disease, glaucoma, optic neuropathy, ischemic retinal disease, retinopathy of prematurity, retinal vascular occlusion, familial macroaneurysm, a retinal vascular disease, an ocular vascular diseases, a vascular disease, or ischemic optic neuropathy.

5. The formulation, product of manufacture or composition for use according to any one of the preceding claims, wherein the cells in the composition further express one or more markers selected from the group consisting of vimentin, CD9, CD81, AQP4, CXCR4, CD15/LeX/SSEA1, GD2 ganglioside, CD133, β3-tubulin, MAP2, GFAP, OPN/SPP1, PTN, KDR, and TEK.

6. A method of making a formulation, product of manufacture or composition comprising a heterogeneous mixture of non-immortal human fetal neural retinal cells, comprising:

(a) mechanically and/or enzymatically dissociating an obtained sample of human retinal tissue cells from a human about 12 weeks to about 28 weeks gestational age to generate a dissociated suspension of cells and/or cell clusters,

wherein the harvested sample of cells and/or small cellular clusters are enzymatically dissociated using trypsin or equivalent, or Tryp-LE Express™ (TrypLE™ Express, Invitrogen-Life Technologies, Carlsbad CA) or equivalent; and

(b) culturing the cells and/or cell clusters in a sterile environment comprising serum-free media in culture flasks or plates coated with a xeno-free fibronectin, an ornithine, a polylysine, a laminin or a Matrigel and antibiotics and antifungals or no antibiotics or anti-fungals, for about 10 to 30 passages,

wherein the cells are passaged at between 40% to 90% confluence and treated with an enzyme at each passage to dissociate the cells and the culture media is changed about every 1 to 2 days,

and the media is supplemented with vitamin C added every 1 or 2 days in an amount between 0.01 mg/ml to 0.5 mg/ml.

7. The method of claim 6, wherein the cells and/or cell clusters are cultured in a culture media comprising a Dulbecco's Modified Eagle Medium: Nutrient Mixture F-12™

(DMEM/F12™) media or an ADVANCED DMEM/F12™ media (Gibco-Invitrogen-Life Technologies, Carlsbad CA) or an ULTRACULTURE™ media (BioWhittaker-Lonza Walkersville, Inc., Walkersville, MD).

8. The method of claim 7, wherein the cells and/or cell clusters are cultured together with supplements or additives that support cell survival or growth.

9. The method of claim 8, wherein the supplements or additives that support cell survival or growth are selected from the group consisting of L-glutamine, human recombinant growth factors consisting of EGF and bFGF (Invitrogen), and other growth factors.

10. The method of claims 6-9, wherein the cells and/or cell clusters are cultured or grown under low oxygen conditions, or oxygen conditions that approximate or closely mimic oxygen levels of a developing fetal retina during gestation, or at about 2%, 2.5%, 3%, 3.5% oxygen.

11. The method of claims 6-10, wherein the media is supplemented with albumin, or recombinant albumin in an amount to have an initial concentration of about 1.0 mg/ml).

12. The method of claims 6-11, wherein the sample of cells is screened for the presence of a pathogen, a bacteria, an endotoxin, a fungus, a mycoplasma, a virus, a hepatitis virus or an HIV virus.

13. The method of claims 6-12, wherein the sample of cells is screened for the presence of a normal karyotype.

14. The method of claims 6-13, wherein the sample of cells does not exhibit elevated telomerase activity.

15. The method of claims 6-14, wherein the sample of cells is screened for viability.

16. The method of claims 6-15, wherein the sample of cells is screened for tumorigenicity.

17. The method according to any one of claims 6-16, wherein the method for making the heterogeneous mixture of non-immortal human fetal neural retinal cells further comprises:

(a) selecting human fetal neural retinal cells on the basis of cell surface or genetic markers, or

(b) selecting human fetal neural retinal cells on the basis of a human fetal neural retinal cell transcriptome profile, proteome profile and/or a genomic profile.

18. The method of claim 17, wherein step (a) further comprises selecting the cells either before culturing (prospectively) or after culturing or both.

19. A method for isolating a population of non-immortal human retinal progenitor cells comprising:

mechanically and/or enzymatically dissociating a sample of human retinal tissue that is from a stage after the retina is formed but before photoreceptor outer segments are fully formed throughout the retina and before retinal vascularization is substantially completed or completed to generate a dissociated suspension of cells and cell clusters; and

culturing the dissociated suspension for about 10-30 passages,

wherein the cells are passaged at between 40% to 90% confluence and treated with an enzyme at each passage to dissociate the cells and the culture media supplemented with between 0.01 mg/ml and 0.5 mg/ml vitamin C is changed about every 1 to 2 days,

wherein the human retinal progenitor cells express one or more markers selected from the group consisting of nestin, Sox2, Ki-67, MHC Class I, and Fas/CD95, wherein nestin is expressed by greater than 90% of the cells in the population, wherein Sox2 is expressed by greater than 80% of the cells in the population, wherein Ki-67 is expressed by greater than 30% of the cells in the population, wherein MHC Class I is expressed by greater than 70% of the cells in the population, and wherein Fas/CD95 is expressed by greater than 30% of the cells in the population.

20. The method of claim 19, wherein the human retinal tissue is obtained from a human fetal retina at a gestational age between about 12 weeks to about 28 weeks.

21. The method of claims 19-20, wherein the cells are cultured at atmospheric oxygen levels or, wherein the cells are cultured at oxygen levels between about 0.5% to about 7%.

22. The method of claims 19-21, wherein the cells are cultured in serum-free or reduced serum cell culture media.

23. The method of claims 19-22, wherein the media further comprises albumin.

24. The method of claims 19-23, wherein the cells in the population further express one or more markers selected from the group consisting of vimentin, CD9, CD81, AQP4, CXCR4, CD15/LeX/SSEA1, GD2 ganglioside, CD133, β3-tubulin, MAP2, GFAP,

OPN/SPP1, PTN, KDR, and TEK.

25. A cell population comprising non-immortal human retinal progenitor cells, wherein cell population is made by mechanically and/or enzymatically digesting human retinal tissue to generate a dissociated suspension of cells and cell clusters and culturing the suspension in serum free culture medium in culture flasks or plates coated with xeno-free fibronectin, an ornithine, a polylysine, a laminin, or a Matrigel for between 10 and 30 passages, wherein the cells are passaged by treating with an enzyme at each passage to dissociate the cells and adding fresh culture media supplemented with between 0.01 mg/ml and 0.5 mg/ml vitamin C every 1 to 2 days such that the non-immortal human retinal progenitor cells express one or more markers selected from the group consisting of nestin, Sox2, Ki-67, MHC Class I, and Fas/CD95, wherein nestin is expressed by greater than 90% of the cells in the population, wherein Sox2 is expressed by greater than 80% of the cells in the population, wherein Ki-67 is expressed by greater than 30% of the cells in the population, wherein MHC Class I is expressed by greater than 70% of the cells in the population, and wherein Fas/CD95 is expressed by greater than 30% of the cells in the population.

26. The non-immortal human retinal progenitor cell population of claim 25, wherein the cells in the population further express one or more markers selected from the group consisting of vimentin, CD9, CD81, AQP4, CXCR4, CD15/LeX/SSEA1, GD2 ganglioside, CD133, β3-tubulin, MAP2, GFAP, OPN/SPP1, PTN, KDR, and TEK.

27. The method of claim 17, wherein the cell surface or genetic markers comprise CD15/LeX/SSEA1 and/or GD2 ganglioside.

28. The method of claim 17, wherein the cell surface or genetic markers comprise CD9, CD81, CD133 or AQP4 and/or CXCR4.