**Table 1. Stem Cell/Cell Therapy Companies /Institutions Active in Ophthalmology**

| Company | Collaborator(s) | Cell Type | Applications |
|---|---|---|---|
| **Advanced Cell Technology Inc. (ACT)** | Oregon Health & Science University (OHSU)<br>● Moorfields Eye Hosp.<br>● UCLA/Jules Stein<br>● Wills Eye Hospital<br>● Aberdeen Royal Infirm.<br>● Bascom Palmer<br>● Mass Eye & Ear | hESCs | RPE cells for retinal diseases, including Dry AMD NCT01344993 and Stargardt's NCT01345006 NCT01469832 |
| **AstraZeneca** | Univ. College London (UCL) | hESCs | Diabetic Retinopathy |
| **BetaStem Therapeutics** | University of Florida | CD34+ cells from human cord blood or bone marrow | Diabetic Retinopathy (in preparation for human clinical trials) |
| **Cell Cure Neurosciences** | TEVA | hESCs | RPE cells for dry AMD |
| **CellSeed France SARL** | FGK Clinical Reserach GmbH<br>● Universitatsklinkum, Erlangen, Germany | oral mucosa epithelial cells | CAOMECS* for Corneal tissue repair in those with limbal cell deficiencies NCT01489501 |
| **Centre Hospitalier d'Ophth. des Quinze-Vingts, Paris** | Etablissement Francais du Sang lie-de-France | transplantation of cultured allogenic or autologous limbal stem cells | limbal stem cell deficiency NCT01619189 |
| **CHA Bio & Diostech (S. Korea)** | Licensee of ACT | hESCs | RPE cells for retinal diseases, including Stargardt's NCT01625559 and Dry AMD NCT01674829 |
| **Fundacion Clinic per a la Recerca Biomedica (Spain)** | ● Hospital Clinic Barcelona<br>● Instituto Univ. Barraquer<br>● Instituto de Microcirugia Ocular | sclerocorneal progenitor cells from the limbus | Replacement of damaged corneal cells NCT01470573 |

| Company | Collaborator(s) | Cell Type | Applications |
|---|---|---|---|
| **General Hosp of the Chinese People's Armed Police Force (China)** | | unknown | Optic Nerve Atrophy ChiCTR-TNRC-11001491 |
| **Instit. Univ. De Oftalmobiologia Aplicada, Valladolid, Spain** | • Univ. Of Valladolid<br>• Centro en Red de Medicina Regen. de Castilla y Leon<br>• Red de Terapia Celular | bone marrow mesenchymal stem cells | Limbal cell deficiency NCT01562002 |
| **International Stem Cell Corp. (ISCO)** | CytoCor -<br>• Absorption Systems - US<br>• Sankara Nethralaya - India<br>• Automation Partnership - UK<br><br>CytoRet - UC Irvine | hpSCs<br><br>hpSCs | Corneal tissue for transplantation into degenerated corneas<br><br>RPE cells and layered retinal structures for AMD |
| **Janssen R&D/J&J w/ iScience Interventional** | • Retina Institute of CA<br>• Wills Eye Hospital | Adult SCs (CNTO 2746 from umbilical cord fluid) | RPE cells for GA (atrophic dry AMD) NCT01226628 (Re-started 7-13-12) |
| **Dr. Jeffrey Goldberg Univ. of Miami** | Bascolm Palmer Eye Institute | encapsulated human RPE cells (CNTF) NT-501 | Optic Nerve Atrophy NCT01408472<br><br>Glaucoma - Primary Open Angle NCT00063765 |
| **Mahidol Univ. (Thailand)** | Ministry of Health, Thailand | bone marrow-derived Mesenchymal stem cells<br><br>corneal epithelial stem cells | Retinitis Pigmentosa NCT01531348<br><br>ocular surface reconstruction/limbal deficiency NCT01237600 (completed) |
| **Mesoblast** | | Adult SCs (VEGF) | Wet AMD |

| Company | Collaborator(s) | Cell Type | Applications |
|---|---|---|---|
| **Ministry of Health, Malaysia** | | autologous transplantation of cultured limbal stem cells | Treatment of ocular surface diseases NCT01123044 |
| **National Eye Institute (NEI)** | NIH Clinical Center | encapsulated human RPE cells (CNTF) NT-501 | CNGB3 Type Achromatopsia NCT01648452<br><br>Retinitis Pigmentosa NCT00063765 (Completed) |
| **National Taiwan Univ. Hosp.** | | Oral mucosal stem cells | Corneal stem cell dificiency, ocular surface repair NCT00491959 (Study terminated due to unstable cell sheet quality) |
| **NeoStem Inc.** | Schepens Eye Research Institute | Adult SCs (VSELs - very small embryonic-like from bone marrow) | In animal models for treating glaucoma and AMD |
| **Neurotech** | | encapsulated human RPE cells (CNTF) NT-501 | GA/Dry AMD<br><br>Retinitis Pigmentosa/Usher Syndrome Types 2 & 3, and Choroideremia NCT00447980 NCT00447993 (Both Completed)<br><br>Retinitis Pigmentosa/Usher Syndrome Types 2 & 3 NCT01530659<br><br>Macular Telangectasia (MacTel) NCT01327911 |

| Company | Collaborator(s) | Cell Type | Applications |
|---|---|---|---|
| **Osaka Univ Grad School of Medicine (Japan)** | | oral mucosa epithelial cells | Corneal tissue repair in those with corneal epithelial cell deficiencies JPRN-UMIN000005400 |
| **Pfizer Regenerative Medicine/Pfizer Ophthalmics** | • Univ. College London (UCL) (London Project to Cure Blindness) | hESCs | RPE mat for wet AMD NCT01691261 |
| | • EyeCyte Inc. with Scripps Research Inst. | Adult SCs (From bone marrow) | Treating Retinal diseases including diabetic retinopathy ROP, RVO, AMD, and RP |
| **Riken Center for Developmental Biology** | | iPS cells | RPE for AMD Clinical trials in 2013 |
| | | hESCs | optic cup for retinal regeneration |
| **ReNeuron** | Schepens Eye Research Institute | Adult SCs (ReN003) | Treating RP (Pre-clinical) and AMD |
| **Royan Institute (Tehran, Iran)** | Labafi Nejad Eye Res. Center | transplantation of cultured limbal stem cells | Treating limbal cell deficiency NCT00736307 (completed) |
| **StemCells Incorporated** | Anderson Vision Research Center at Retina Foundation of the Southwest | Adult SCs (HuCNS-SCs - purified human neural stem cells) | For retinal degenerative diseases, including photoreceptor protection to preserve visual function in dry AMD and retinitis pigmentosa NCT01632527 |
| **Stemedica** | Fyodorov Eye Microsurgery Center, Moscow | Adult SCs | Stem cell injection following spot laser damage of retina, for RP, AMD, DR<br><br>Glaucoma |
| **Tehran Univ. of Medical Sciences** | Shariati Hosp., Tehran, Iran | Autologous bone marrow cells | Bechet's Disease NCT00550498 (Terminated) |

| Company | Collaborator(s) | Cell Type | Applications |
|---|---|---|---|
| **Univ. Cal. Davis** | | CD34+ autologous bone marrow stem cells, intravitreal | dry AMD, diabetic retinopathy, retinal vein occlusion,Stargardts & retinitis pigmentosa NCT01736059 |
| **Univ. of San Paulo** | Rubens Siqueira Research Center | bone marrow-derived mononuclear stem cells (BMMSCs) | Intravitreal BMMSCs for: advanced AMD (wet?/GA) NCT01518127, ischemic retinopathy NCT01518842, retinitis pigmentosa NCT01068561 (completed) and NCT01560715 |
| **Univ. Hosp. Antwerp** | Fund for Scientific Research ESCRS | limbal stem cell transplant | NCT00845117 |
| **Tohoku Univ. Grad School of Medicine (Japan)** | | oral mucosa epithelial cells | Corneal tissue repair in those with corneal epithelial cell deficiencies JPRN-UMIN000006745 |

**Irv Arons**, **April 2013** (Version 18, April 23, 2013)

NCT - National Clinical Trial (ClinicalTrials.gov)

*Cultured Autologous Oral Mucosal Epithelial Cell-sheet (CAMOMECS)