OPEN ACCESS

International Journal of Applied Sciences and Biotechnology

A Rapid Publishing Journal

ISSN: 2091-2609

Indexing and Abstracting

CrossRef, Google Scholar, Global Impact Factor, Genamics, Index Copernicus, Directory of Open Access Journals, WorldCat, Electronic Journals Library (EZB), Universitätsbibliothek Leipzig, Hamburg University, UTS (University of Technology, Sydney): Library, International Society of Universal Research in Sciences (EyeSource), Journal Seeker, WZB, Socolar, BioRes, Indian Science, Jadoun Science, Jour-Informatics, Journal Directory, JournalTOCs, Academic Journals Database, Journal Quality Evaluation Report, PDOAJ, Science Central, Journal Impact Factor, NewJour, Open Science Directory, Directory of Research Journals Indexing, Open Access Library, International Impact Factor Services, SciSeek, Cabell's Directories, Scientific Indexing Services, CiteFactor, UniSA Library, InfoBase Index, Infomine, Getinfo, Open Academic Journals Index, HINARI, etc.

CODEN (Chemical Abstract Services, USA): IJASKD

Vol-4, Issue-1 (March, 2016)

Available online at:
http://www.ijasbt.org
&
http://www.nepjol.info/index.php/IJASBT/index

SEM-Biotech Publishing

Impact factor*: **1.422**
Scientific Journal Impact factor#: **3.419**
Index Copernicus Value: **6.02**
IBI Factor 2015**: **4.19**

*Impact factor is issued by Universal Impact Factor. Kindly note that this is not the IF of Journal Citation Report (JCR).
#Impact factor is issued by SJIF INNO SPACE; **Impact factor is issued by INFOBASE INDEX.

V. Singh (2016) Int J Appl. Sci Biotechnol, Vol 4(1): 1-2
DOI: 10.3126/ijasbt.v4i1.14726

ISSN (Online): 2091-2609
DOI Prefix: 10.3126/ijasbt

International Journal of Applied Sciences and Biotechnology (IJASBT)

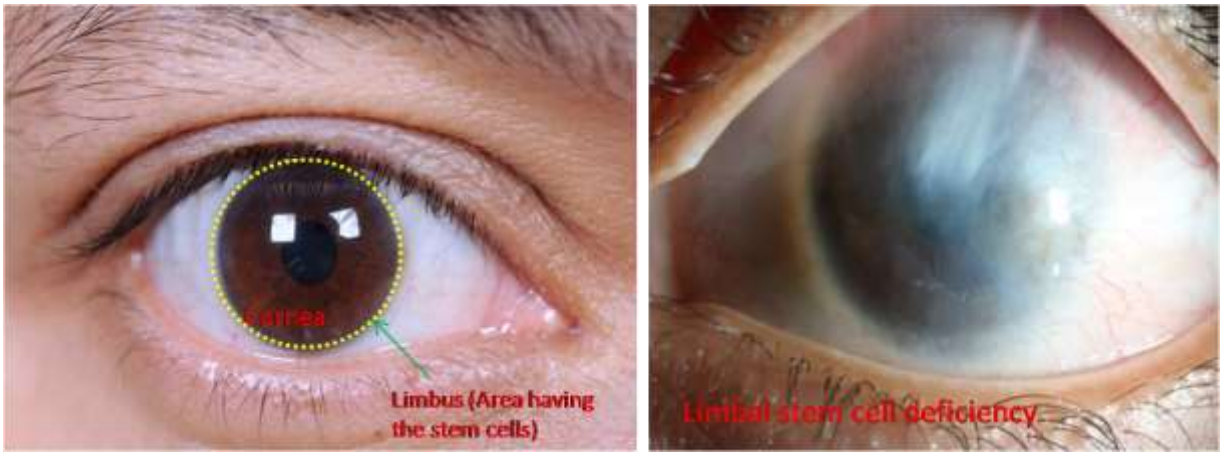
Editorial

EVOLVING STEM CELLS RESEARCH IN VISION RESTORATION: A REALITY CHECK!

Vivek Singh

Of the five senses, sight is perhaps the most appreciated. A major contributor to clear vision is the cornea, often called the "window of the eye." Its main role is to focus light onto the retina so that the cells there can transmit information about what the eye is seeing to the brain. When the cornea is damaged, the healing process could result in scars which blocks or disrupts light from reaching the retina. Can we imagine life without colors, the beauty of the butterfly and color of rising sun Especially the feeling when, the first sun rays shoot ahead and shed light on the twin peaks of Kanchenjunga, painting it pink and then bathing it in a beautiful orange colour; or the glowing Taj Mahal on a full moon night and it's never lasting beauty. As an electric bulb that needs constant power supply or the sun that needs fusion reaction to spread the light to lets us see, similarly the corneal outer layer needs to be replenished by new cells derived from stem cells residing in the limbus region (yellow dotted area in Figure provided) to maintain its crystal clarity to have vision.

Being the outermost surface of the eye, the transparent dome like cornea is a firm covering and is susceptible to dryness and abrasion injuries. It also faces continuous stress due to dust, pollution, photo-damage, and infection. However, just as the skin does, cornea too is reliant on a self-renewal program to preserve its integrity, thus keeping the ocular outer surface stable and functional. Epithelial regeneration capacity of cornea is either regressed or lost in cases of limbal stem cell deficiency (LSCD) which poses a challenge for visual rehabilitation[1, 2].



You will be surprised to know that the common cause of these LSCD are also human errors (like lime injury, alkali burn, thermal burn, etc) while others are related to our DNA, physiology and birth.

Stem cells have been in the news for several years and have been the source of much controversy in spite of their vast therapeutic potential. However, the reason for the controversy has mainly been with the usage of stem cells of embryos and pro-life factions. Embryonic stem cells (ESCs) have the potential to differentiate into any cell in the body, opening up the possibility of generating organs for transplant. While growing an entire organ *ex vivo* may be out of reach at the moment, transplanting stem cells can have a regenerative effect. There is complete moratorium on manipulating embryo or its gene.

Finally, for us to applaud, this year (2015), the European Commission has approved stem cell therapy for people with severe limbal stem cell deficiency due to burns, which was the first time that a stem cell therapy other than the use of umbilical cord stem cells was allowed to be sold by any regulatory agency in the world by the trade name Holoclar®. This effort is led by renowned Italian team of Professor Michele De Luca and Professor Graziella Pellegrini, who were also the pioneers in exploring the importance of limbal stem cells from bench to bed side[1].

We have to remember that loss of vision function also causes social and economic handicaps and can even lead to total personality changes. I will prefer to use the term "Divyaang (Divine body)" instead of "Viklang" (physically challenged) for those visually challenged as quoted by Indian Prime Minster in his motivating talk to Nation, as these visually challenged people have always achieve divine sense power. In the coming years, stem cell therapy for visual impairment might not be a big challenge but we need to ensure that it must be implemented following scientific regulations with the best trained clinician support and stem cell cultures manufactured in GMP (Good Manufacturing Practice)-certified facilities. Hope the government of different countries, philanthropist and private sector grant more funds to make this stem cell therapy accomplish its destination with colorful fruits and in shorter time frame.

[1]Pellegrini G and De Luca M (2014) Eyes on the prize: limbal stem cells and corneal restoration. *Cell Stem Cell* **15**(2): 121-122. DOI: 10.1016/j.stem.2014.07.011

[2]Singh V, Shukla S, Ramachandaran C, Mishra DK, Chauhan S, Katikireddy KR, Lal,I. and Sangwan VS (2015) Science and art of cell based ocular surface regeneration. *Int. Rev. Cell. Mol. Biol*. **319**: 45-106. DOI: 10.1016/bs.ircmb.2015.07.001

Vivek Singh, PhD
Assistant Editors
International Journal of Applied Sciences and Biotechnology