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## Potentials of human umbilical cord-derived cells in clinical application

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Extensive studies of the human umbilical cord, both basic and translational, over the last three decades have unveiled a plethora of information. The cord lining harbors at least two phenotypically different multipotent stem cells- mesenchymal stem cells (MSCs) and cord lining epithelial stem cells (CLECs). These cells exhibit mixed genetic profiling of both embryonic and adult stem cells, hence display broader stem features than cells from other sources. Importantly, umbilical cord-derived cells are immunologically privileged, non-tumorigenic, and ethically acceptable, thus provides a significant advantage over other stem cells. The high proliferative capacity, viability, differentiation potential and superior harvest of these cells have made them better candidates in comparison to contemporary adult stem cells. Following 30 replication cycles, these cells have been observed to retain their stemness, with their phenotype and karyotype intact. The striking features of low immunogenicity protecting self along with co-transplanted allografts from rejection largely define the transplantation potential of umbilical cord-derived stem cells. A good number of recent pre-clinical and clinical studies

have established the amazing prospects of cord-derived stem cells in regenerative medicine. These cells have been successfully applied to many chronic conditions, using animal models, including type 1 diabetes, limbal stem cell deficiency, burn injuries, and wound healing, etc. with encouraging results. A substantial number of clinical trials using MSCs and CLECs are currently in progress, results of these studies are likely to delineate the potential use of these affordable and allograftable stem cells in various clinical applications.

### Speaker Biography

Hasan Mahmud Reza has a solid experience of research and teaching for more than 22 years in reputed universities and institute in Bangladesh, Japan and Singapore. He completed his B Pharm and M Pharm degrees from the University of Dhaka. He is currently leading several research teams dedicated to work on pharmaceutical dosage form development, behavioral neuroscience, natural products and lifestyle diseases like hypertension, in addition to stem cell research.

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