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Induced tissue regeneration (iTR): Leveraging the unique regenerative potential of pluripotent stem cell-derived therapeutics

Human pluripotent stem cell lines display the potential to cascade through all primary germ layers and hence, all human somatic cell types. This pluripotency has led to the prospect of using working cell banks of pluripotent cells to generate previously rare and valuable cell types on an industrial scale. The striking capacity of pluripotent stem cells to form organoids *in vitro*, a property not typically seen in adult-derived cells, may reflect the unique regenerative potential of somatic cells before undergoing the embryonic-fetal transition (EFT). The demonstration that pre-EFT embryonic progenitors can be robustly clonally expanded is leading to a facile comparison of the transcriptomes of embryonic/regenerative cells and their adult counterparts. The identification of markers of EFT such as *COX7A1* expression, opens the door to the deliniation of the molecular pathways regulating the biology of EFT with potentially profound implications for novel quality control assays useful in the manufacture of pluripotent cell-derived therapeutics, but perhaps more importantly, methods for inducing tissue regeneration *in vivo*, as well as new insights into cancer biology. Examples of the utility of this biology in the context of the manufacture of embryonic brown adipocyte and vascular progenitors, as well as in modulating iTR for therapeutic effects in age-related degenerative disease and cancer will be discussed.

Biography

Michael D West is Co-Chief Executive Officer of BioTime, Inc. (NYSE MKT: BTX) and CEO of BioTime's subsidiary AgeX Therapeutics, Inc. BioTime is focused on developing an array of research and therapeutic products using pluripotent stem cell technology. He received his PhD from Baylor College of Medicine in 1989 concentrating on the biology of cellular aging. He was the Founder and first CEO of Geron Corporation of Menlo Park, California (Nasdaq: GERN), held positions as CEO, President, and Chief Scientific Officer at Advanced Cell Technology, Inc., which was acquired by Astellas Pharma, Inc., and founded Asterias Biotherapeutics (NYSE MKT: AST).

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