

BIONAND 2017 CONFERENCE SERIES

Biomedical applications of somatic cell reprogramming

Dr. Ángel Raya Chamorro

*MD, PhD , ICREA Research Professor, Centre de Medicina Regenerativa de Barcelona (CMRB)
e-mail: araya@cmrb.eu*

Abstract:

Takahashi and Yamanaka were the first to generate induced pluripotent stem cells (iPSC) by nuclear reprogramming of other cell types with defined combinations of transcription factors. Ever since, a large number of laboratories worldwide have validated the technique, and in fact iPSC can now be produced routinely from multiple species (including humans) and using multiple methods. The implications of reprogramming in general and of human iPSC in particular are vast. On the one hand, human iPSC are providing outstanding models for drug/toxicity screening and disease mechanistic studies. In this respect, I will summarize efforts from our lab and others on the use of patient-specific iPSC to model human diseases, with particular emphasis on Parkinson's disease. On the other hand, reprogramming technology also holds promise for future cell-based therapies; here, I will briefly introduce current limitations of this strategy and outline ongoing approaches to obtain mature, functional cells for cell replacement therapies.

References:

- Sanchez-Danes et al. EMBO Mol Med (2012) 4:380-95.
- Orenstein et al. Nat Neurosci (2013) 16:394-406.
- Canals et al. Stem Cell Rep (2015) 5(4):546-57
- Fernández-Santiago et al. EMBO Mol Med (2015) 7:1529-46.
- Prieto et al. Nat Commun (2016) 7:11124.
- Capellera-Garcia et al. Cell Rep (2016) 15:2550-62.
- Pulecio et al. Cell Rep (2016) 17:671-83.