The promises of human-induced pluripotent stem cells (hiPSCs) for modeling arrhythmogenic disease, but also for drug discovery and toxicity tests, are straightforward and exciting. However, the full potential of this new technology has not been fully realized yet. The purpose of this review is to provide an overview of the state-of-the-art research in arrhythmogenic disease modeling and drug discovery and an outlook of what can be expected from the second decade of hiPSC-based arrhythmia research. Remarkable advances in genomic discoveries, stem cell biology, and genome editing via sequence-specific nucleases have been made in recent years. Together, these breakthroughs have allowed us to progress from studying monogenetic diseases with a direct genotype-phenotype relationship to genetically more complex diseases such as arrhythmogenic right ventricular dysplasia and atrial fibrillation. In addition, newly developed tools for arrhythmia research such as optical action potential recordings have facilitated the use of hiPSCs for drug and toxicity screening and their eventual clinical use. These advances in in vitro assay development, genome editing, and stem cell biology will soon enable the implementation of hiPSC-based findings into clinical practice and provide us with unprecedented insights into mechanisms of complex arrhythmogenic diseases.
Occurences:

- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Klinik und Poliklinik für Plastische Chirurgie und Handchirurgie (keine SAP-Zuordnung!) > Arbeitsgruppe Tissue Engineering und Regenerative Medizin > 2017

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