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Oral Presentation

Session: Target Identification and New Screening Applications

16:10 – 16:35 PM

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## High throughput solutions for cardiac drug and safety research

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In the ever-evolving world of safety pharmacology, adequate tools and strategies are not only preferred but necessary. Ion channels have long been targets for various safety testing. However, other proteins involved in the transport of ions across membrane barriers are becoming increasingly relevant for pharmacological safety. Additionally, the need for high throughput measurements moved the industry demand towards automated systems.

Here, we focus primarily on the development and applications of such automated technologies in cardiac safety testing, as done during the Comprehensive in Vitro Proarrhythmia Assay (CiPA) initiative introduced by FDA. This initiative is focused on proarrhythmia to improve specificity compared to in vitro hERG and in vivo QT studies. We combined automated patch clamp (APC), impedance and extracellular field potential (EFP) measurements in order to study cardiac ion channels in cell lines and hiPSC-derived cardiomyocytes (hiPSC-CMs). Data emphasizing protocols, ease of use and results obtained in this initiative will be presented. To drive the progress of pharmacological investigations, of not only ion channels but of cardiac transporters as well, we have developed a novel, solid supported membrane (SSM) - technology based device. Here, we will also show measurement comparisons of data obtained from cell lines and hiPSC-CMs.

In conclusion, by providing automated high-throughput systems with cross-site and cross-cell stable recordings, using open data and analysis concepts, valuable and powerful solutions for safety pharmacology, as well as drug development efforts, are emerging.