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NEW TRENDS & TECHNICAL CHALLENGES ON CBRNE

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Next level toxicity screening:

from single channel to overall cell behavior

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During the approval process of new drugs a lot of the lead compounds fail in the late stages of development mainly by inflicting drug induced injury on liver, heart or other organs. Therefore, devices for detecting possible cell toxicity in early stages of the development process are highly demanded. Especially ion channels represent an important class of drug targets for *in vitro* pharmacological profiling.

High throughput screening (HTS) assays such as automated electrophysiological patch clamp and impedance based assays allow for the determination of drug effects on a whole cell level whereas artificial bilayers provide a robust environment for the assessment of single ion channel molecules.

We here present the CardioExcyte 96, a system providing a combination of Electric Impedance Spectroscopy (EIS) as well as Electric Field Potential (EFP) readout for a network of diverse cells like iPS cardiomyocytes or Hepatocytes which is exemplified by toxicity effects utilizing reference compounds such as Dofetilide (on iPS cardiomyocytes) or Paracetamol (on hepatocyte-like cells).

Furthermore we present the temperature or drug dependent activation or deactivation of different Transient Receptor Potential (TRP) channels by means of planar patch clamping on our HTS platforms Patchliner and SyncroPatch 384PE as well as with highest resolution on a single channel level on our recently introduced Orbit mini setup.