Cardiotoxicity is a major complication of many anticancer therapies that impacts the quality of life and overall survival of patients. Preclinical models with improved ability to predict structural and functional cardiac liabilities are required to identify toxicological mechanisms, reduce clinical cardiotoxicity potential and identify therapeutic strategies to mitigate these life-threatening effects.

**STUDY AIMS:**
- Using impedance-based real-time cell analysis (xCELLigence RTCA), evaluate the ability of different cardiac cell models to detect structural and functional drug-induced cardiotoxicity.

**RESULTS:**
- Several HDAC inhibitors have been introduced to the clinic or are currently in trial.
- HDAC inhibitors demonstrate clinical cardiotoxicity.
- What is the involvement of HDAC sub-classes in HDAC-induced cardiotoxicity?

**CONCLUSIONS:**
- The integration of different in-vitro models allowed to gain insights into HDAC-mediated cardiotoxicity.
- HDAC inhibition causes both structural and functional aberrations to cardiac cells at sub-clinical drug concentrations.
- Class I HDAC induced detectable toxicity in the form of structural and functional perturbations.
- Class IIa and IIb HDAC did not cause detectable toxicity.