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*In-vitro Recording of Adult Zebrafish Heart Electrocardiogram- A Platform for Pharmacological Testing*

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**Background:** Recently zebrafish has become a powerful vertebrate model system for cardiac arrhythmia and another advantage is that the heart could be rapidly excised for in-vitro electrophysiological recording.

**Methods:** We made direct in-vitro recordings of adult zebrafish heart ECG using the microelectrode array and tested the effects of various drugs on zebrafish heart ECG. The mean optically mapped APD was 308±30 ms, which was close to the QT interval in ECG (p=0.815). We found that sympathomimetic drug isoproterenol increased HR, whereas L-type calcium channel blocker verapamil decreased HR. Sodium channel blocker quinidine and L-type calcium channel activator BayK8644 prolonged QTc interval in a dose-dependent manner (515±24 ms and 519±27 ms, respectively, both p<0.01). The APD was also prolonged accordingly. Both rapidly and slowly activating delayed rectifier potassium channel (IKr and IKs) blockers E4031 and Chromanol 293B, respectively, also prolonged QTc interval in a dose-dependent manner (523±25 ms and 529±27 ms, respectively, both p<0.01). Quinidine, E4031 and Chromanol 293B also decreased HR.

**Conclusions:** Direct in-vitro recording of adult zebrafish heart is an efficient platform for test of drugs which exert electrophysiological effects on cardiomyocytes, and perturbation of ionic channels that are responsible for human long QT syndrome also modulates QT interval in adult zebrafish heart.

**Keywords:** zebrafish, electrocardiogram, long QT