Publication

Whole-cell Configuration of the Patch-clamp Technique in the hERG Channel Assay.

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Abstract

In vitro electrophysiological safety studies have become an integral part of the drug development process since, in many instances, compound-induced QT prolongation has been associated with a direct block of human ether-a-go-go-related gene (hERG) potassium channels or its native current, the rapidly activating delayed rectifier potassium current (I(Kr)). Therefore, the in vitro hERG channel patch-clamp assay is commonly used as an early screen to predict the ability of a compound to prolong QT interval. The protocol described in this unit is designed to assess the effects of new chemical entities after acute or long-term exposure on the amplitude of I(Kr) in human embryonic kidney 293 (HEK293) cells stably transfected with the hERG channel (whole-cell configuration of the patch-clamp technique). Examples of results obtained with terfenadine, arsenic, pentamidine, erythromycin, and sotalol are provided for illustrative purposes.