Special Issue

Functional (Pharmaco) Genomics and Genetics in Atrial Fibrillation Associated with Sudden Cardiac Death Syndromes

Message from the Guest Editors

Atrial fibrillation (AF) is the most common type of sustained cardiac arrhythmia, characterized by disorganized electrical activity in the atria. Electrical chaos is largely driven by ion channel remodeling, which alters the heart's electrophysiological properties. Changes in voltage-gated and non-voltage-gated ion channels have been reported in the pathogenesis of AF. These changes are part of electrical remodeling, which occurs alongside structural remodeling (e.g., fibrosis, cellular differentiation), which further sustains AF. Atrial fibrillation is not just an electrical glitch—it is a complex interplay of ion channel dysfunction, cellular remodeling, and systemic risk factors. Its rising global incidence and economic costs demand more targeted therapies, especially those that address its molecular underpinnings such as ion channel modulation. This Special Issue will address genetics, genomics, 3D and AI-based structural analyses and molecular pathways regulating ion channel function in AF and the potential for future therapeutic opportunities regarding this debilitating disease

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