

Cardiovascular Na⁺/Ca²⁺ Exchanger : Pathophysiologic Roles and Therapeutic Potentials

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Abstract : Na⁺/Ca²⁺ exchanger (NCX) is an ion transporter that exchanges Na⁺ and Ca²⁺ in either Ca²⁺ efflux or Ca²⁺ influx mode, depending on the ion gradients across the plasma membrane and membrane potential. In cardiac and vascular myocytes, NCX is thought to play an important role in the regulation of intracellular Ca²⁺ concentration. Recent studies using selective NCX inhibitors and gene targeting mice reveal etiological implications of NCX1 in cardiovascular diseases, such as cardiac ischemia/reperfusion injuries, heart failure and salt-dependent hypertension. This article presents the recent advance in our understanding of the pathological roles of NCX and the therapeutic potentials of NCX inhibitors.

Key words : Na⁺/Ca²⁺ exchanger, Benzyloxyphenyl NCX inhibitors, Cardiovascular disease, Ischemia/reperfusion injury, Heart failure, Salt-dependent hypertension