

# Diseases associated with leaky hemichannels

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Hemichannels (HCs) and gap junction channels (GJCs) formed by protein subunits called connexins (Cxs) are major pathways for intercellular communication. While HCs connect the intracellular compartment with the extracellular milieu, GJCs allow the interchange of molecules between cytoplasm of two contacting cells. Under physiological conditions, HCs are mostly closed, but they can open under certain stimuli allowing the release of autocrine and paracrine molecules. Moreover, some pathological conditions, like ischemia or other inflammation conditions, significantly increase HCs activity. In addition, some mutations in Cx genes associated with human diseases, such as deafness or cataracts, lead to the formation of more active HCs or "leaky HCs." In this article we will revise cellular and molecular mechanisms underlying the appearance of leaky HCs, and the consequences of their expression in different cellular systems and animal models, in seeking a common pattern or pathological mechanism of disease. © 2015 Retamal, Reyes, García, Pinto, Martínez and González.

Cell death

Connexins

Disease

Gap junction channels

Leaky hemichannels

Mutations

gap junction protein

autocrine effect

biotinylation

cataract

cell communication

chromosome rearrangement

degenerative disease

disease association

electrophysiology

gap junction

gene mutation

hearing impairment

heart disease

human

immunolocalization

inflammation

ischemia

membrane permeability

nonhuman

oculodentodigital syndrome

paracrine signaling

protein expression

Review

skin disease

synaptic transmission