Strategies To Invent Cardiovascular Drugs by Cardiac Gap Junctions

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Citation

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Abstract

In order to prevent and treat cardiac diseases, the author proposed strategies to invent cardiovascular drugs by cardiac gap junctions through summarizing the functions, physiology and pathophysiology of cardiac gap junctions. The 5 principle strategies to invent cardiovascular drugs are created. The 5 principle strategies to invent cardiovascular drugs have the great potentialities to be used as novel proposals to treat and prevent cardiac diseases.

INTRODUCTION

More and more studies have been done on the gap junctions' structure, functions, physiology and pathophysiology. The gap junctions as a pharmacological target for clinical treatments becomes a important topic in medical science. Lots of tissues have gap junctions. But the cardiac gap junctions are the most important gap junctions in the human body. The research on cardiac gap junctions' structure, functions, physiology and pathophysiology has reached good achievements. But the cardiac gap junctions' clinical applications as targets to invent cardiovascular drugs have not developed good results.

There are no reports about the cardiac gap junctions' clinical applications as targets to invent cardiovascular drugs. Which is identified through a MEDLINE search of the English-language literature on “Strategies To Invent Cardiovascular Drugs by Cardiac Gap Junctions” and the key words of this paper or only on the title of the paper.

According to cardiac gap junctions' structure, functions, physiology, pathophysiology characters and recently research achievements about cardiac gap junctions, the author summarized his ideas as following strategies that cardiac gap junctions should be targeted to invent cardiovascular drugs.

1. Cardiac gap junctions blockers or mediators for clinical usages.

Research and select cardiac gap junctions blockers or mediators to mediate or block cardiac gap junction channels. So as to mediate or block the ions and small molecules flowing passage in cardiac gap junctions and electrical activation of the heart's cell-cell transfer of current via gap junctions. As the gap junction blocker had been invented for clinical prevention and treatment in the nervous system. The cardiac gap junctions mediators have a bright future. These strategies may be easy to do.


As cardiac gap junction channels are predominantly composed of connexin40(Cx40) or connexin43(Cx43) proteins. Specially selected molecules to mediate connexin40 or connexin43 proteins expression, transcriptions, and translations or proteins catabolism are also bright ways to mediate cardiac gap junction channels' functions, physiology, pathophysiology activities. These strategies may affect gap junction conductance chronically.


Substances which activate protein kinase C, protein kinase A or protein kinase G may alter Cx43 gap junction conductance. Therefore, modulating protein kinase C, protein kinase A or protein kinase G may alter cardiac gap junction conductance.

4. Reformed mediators like endothelin-1, angiotensin-II, transforming growth factor beta (TGF-beta), vascular endothelial growth factor (VEGF), and cAMP to mediate cardiac gap junction conductance.

Mediators like endothelin-1, angiotensin-II, TGF-beta,
VEGF, and cAMP have been shown to increase Cx43[1]. Pharmacologically change endothelin-1, angiotensin-II, TGF-beta, VEGF, and cAMP et al. into positive substances to mediate cardiac gap junction conductance to treat and prevent cardiac diseases. Which is also a good strategy.

5. Modification of gap junction communication for prevention cardiac diseases.

Researches have found that some substances can prevent cardiac diseases from developing critical stages through modification of gap junction communication[2]. Modifications of gap junction communication for prevention cardiac diseases are another ways to treat and prevent the cardiac diseases. Which may be the best and difficulty way.

There are lots of methods to treat cardiac diseases. But the cardiac diseases are still in high mortality and incidence rate. So the new aspect of research to treat and prevent the cardiac diseases must be developed. More and more researches have been done on the gap junctions' structure, functions, physiology and pathophysiology. The gap junctions as a pharmacological target for clinical treatments becomes a important topic in medical science. In this paper, the author summarized 5 principle strategies to invent cardiovascular drugs by cardiac gap junctions. Which have the great potentialities to be used as principles for inventions of cardiovascular drugs to treat and prevent cardiac diseases.

References
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