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# **Biological pacemaker: from biological experiments to computational simulation**

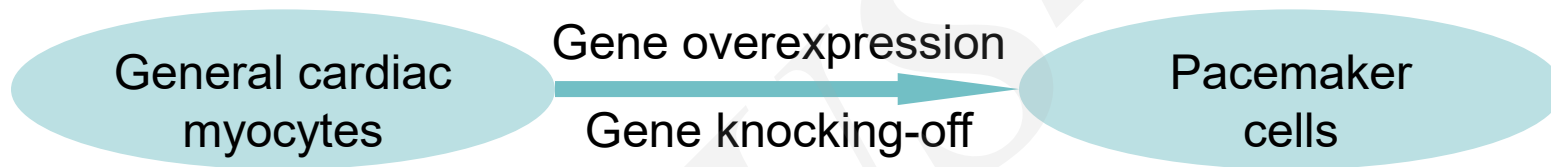
**Key words:** Biological pacemaker; Gene therapy; Cell therapy; cardiac simulation; Computing modelling

# Research Summary

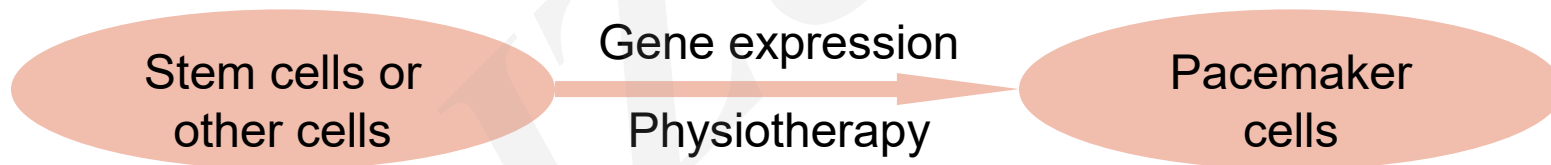
This review summarized the contemporary development of the biological pacemaker in the following aspects:

- **Biological experiments for producing biological pacemakers**

- **Gene therapy**



- **Cell therapy**



- **Computational simulations of biological pacemaker**

# *Innovation points*

- **Introduction** of three kinds of gene that were modified to transfer General cardiac myocytes into pacemaker cells
- **Review** of four kinds of stem cell that are mainly used to differentiate into pacemaker cells.
- **Emphasis** of the Obstacles to producing biological pacemakers.
- **Summary** of the current development of computational research on biological pacemaker.

