

Cardiovascular disease therapeutics via engineered oral microbiota: Applications and perspective



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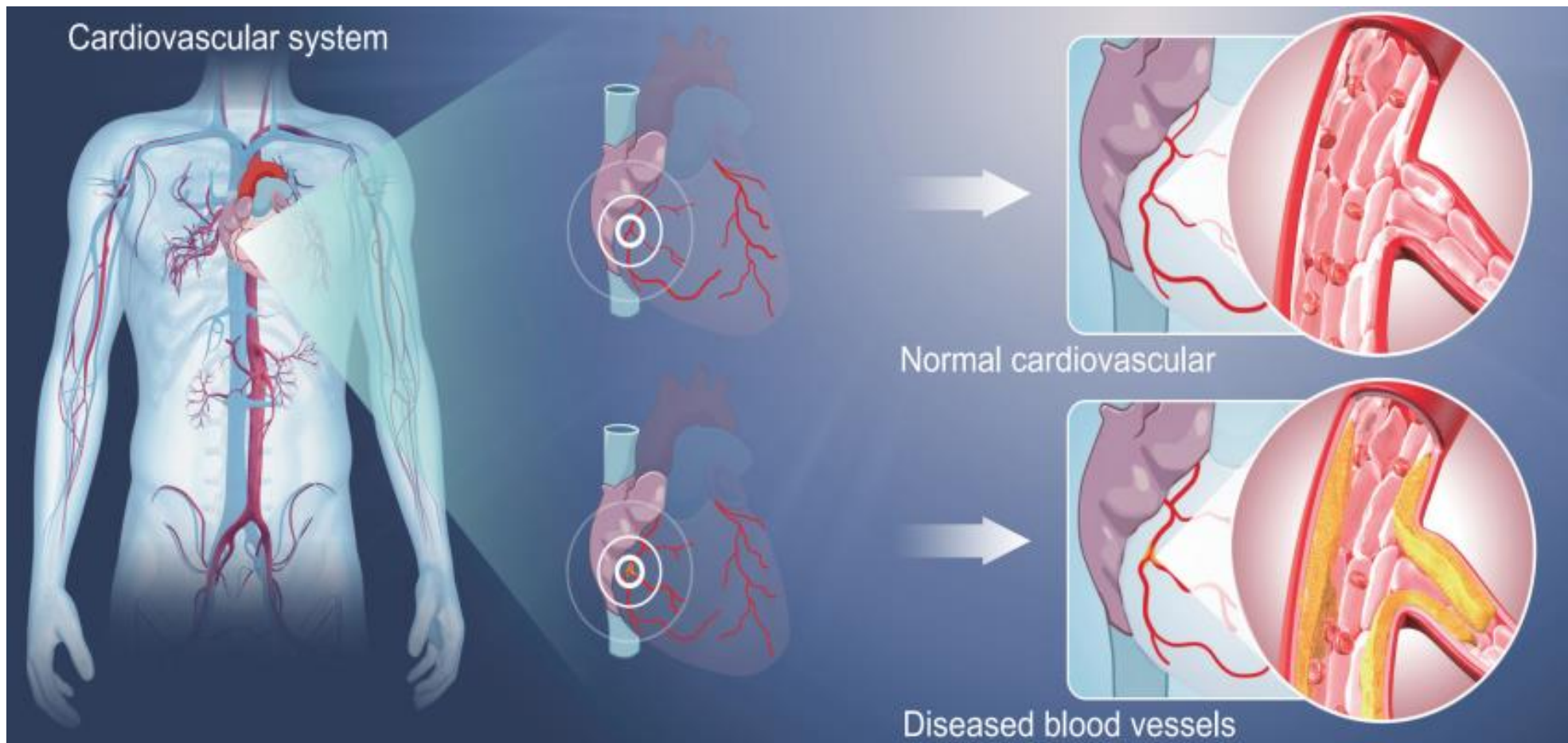
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Background





Background

- ❑ The application of engineered microbiota in cardiovascular diseases (CVDs)
- ❑ The roles and mechanisms of oral microbiota in CVDs
- ❑ The potential of engineered oral microbiota



Association between oral microbiota and CVDs

- ❑ Oral microbiota plays a crucial role in maintaining the stability of the oral microbial environment.
- ❑ Dysbiosis of oral microbiota can lead to the onset of systemic diseases.
- ❑ Periodontal pathogens such as *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans* can be detected in atherosclerotic plaques.
- ❑ Other oral pathogens are also associated with CVDs.



Application of engineered microbiota in CVDs

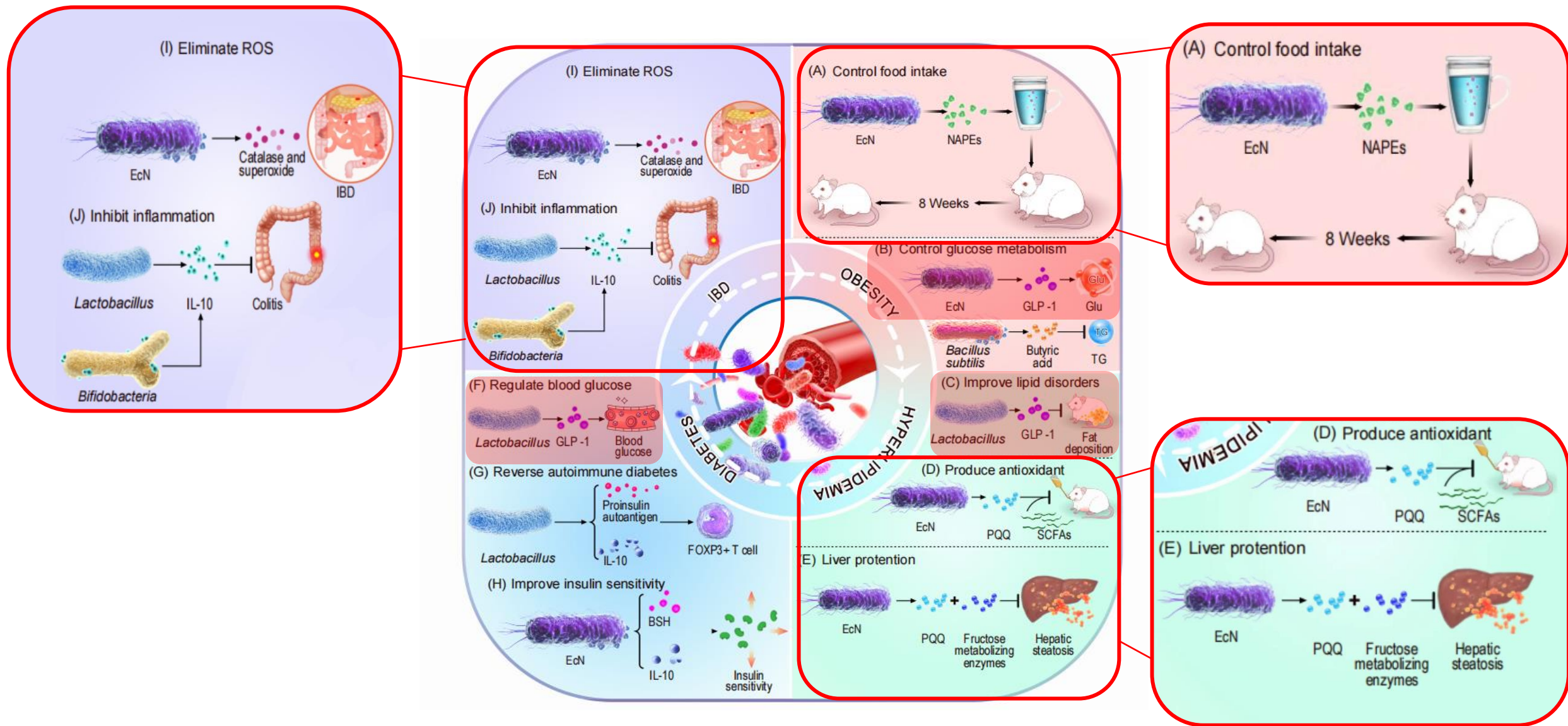


Figure 1. Application of engineering bacteria in CVDs related risk factors.

🔊 The application of oral engineering microbiota in CVDs

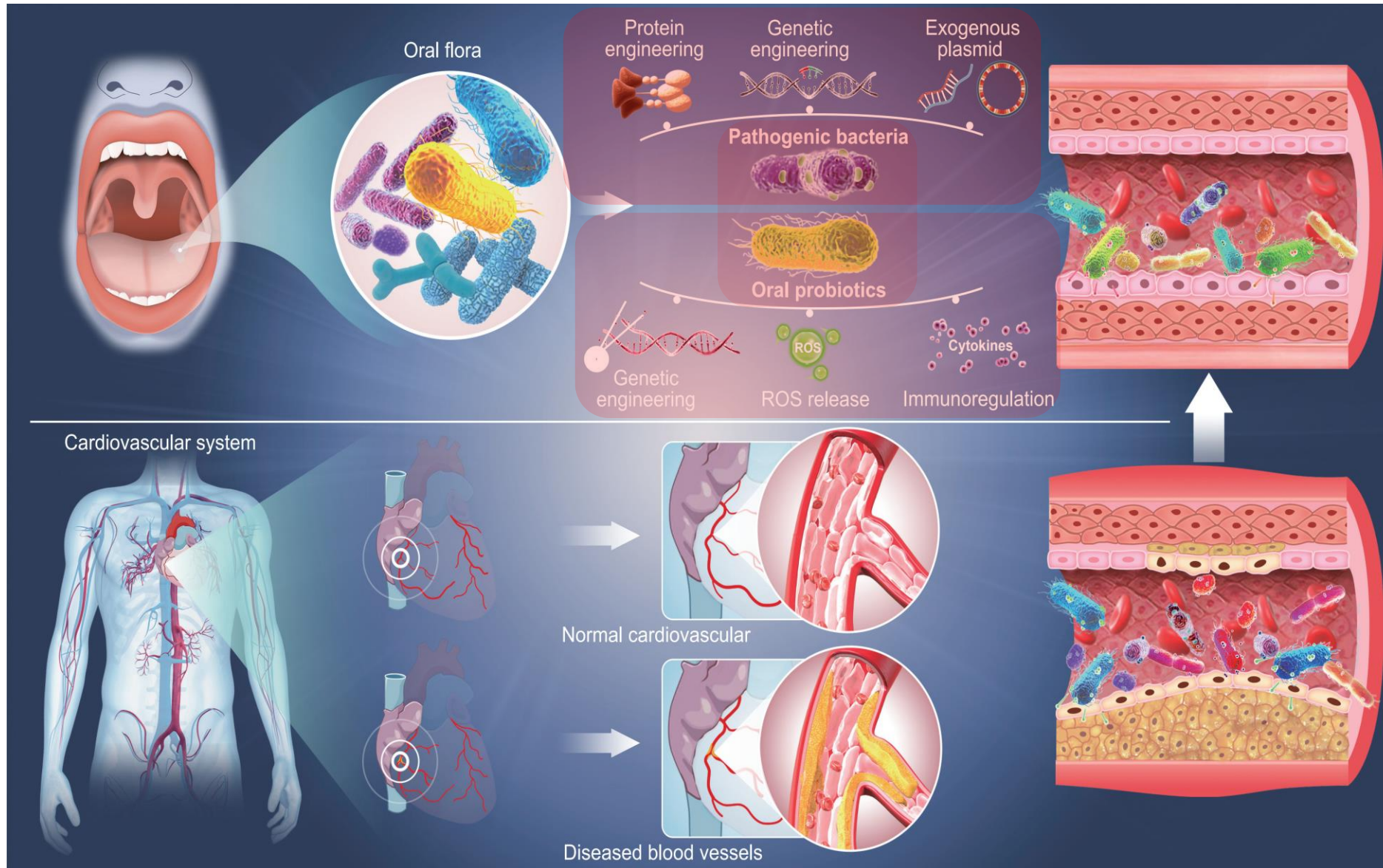


Figure 2. Schematic representation of the application of engineered bacteria in cardiovascular health.



Prospects

Advantages:

- ❑ Oral microbiota provides rich microhabitats.
- ❑ The oral cavity serves as the entry point to the digestive and respiratory systems.
- ❑ The collection methods of oral microbial samples are more convenient and diverse.
- ❑ Oral focal infections may originate from exposed areas, present a pathway for microbiota to invade deep tissues and contribute to systemic inflammation, thereby expanding the potential targets for colonization by engineered oral microbiota.



Prospects

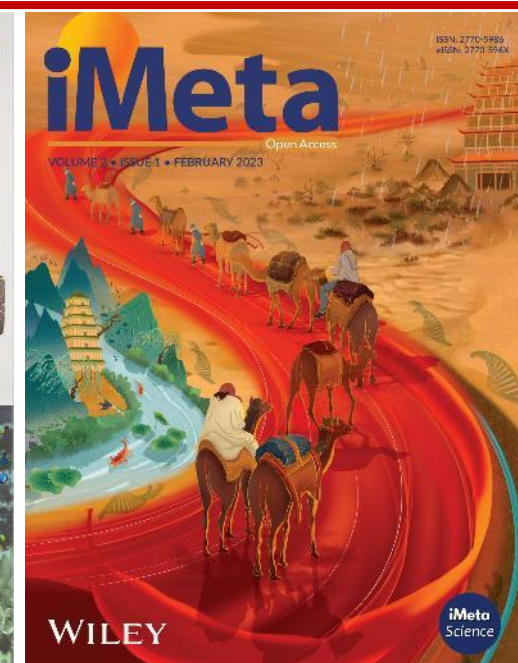
Obstacles:

- ❑ Safety
- ❑ Ethical issues
- ❑ Transformation efficiency
- ❑ Clinical diversity of CVDs phenotypes






Summary



- ❑ Oral microbiota is closely related to the occurrence and development of CVDs.
- ❑ Engineered microbiota is seen as a potential way to treat CVDs and its associated risk factors.
- ❑ Oral probiotics and pathogenic bacteria can provide new avenues for the treatment of CVDs through gene editing and other engineered means.



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