MYOCARDIUM TISSUE

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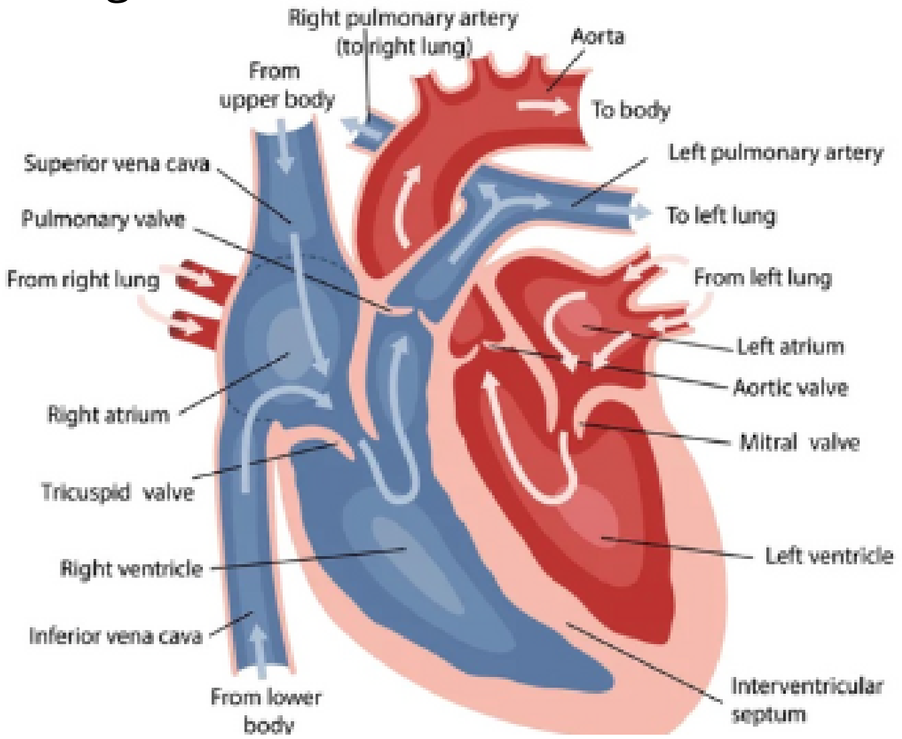
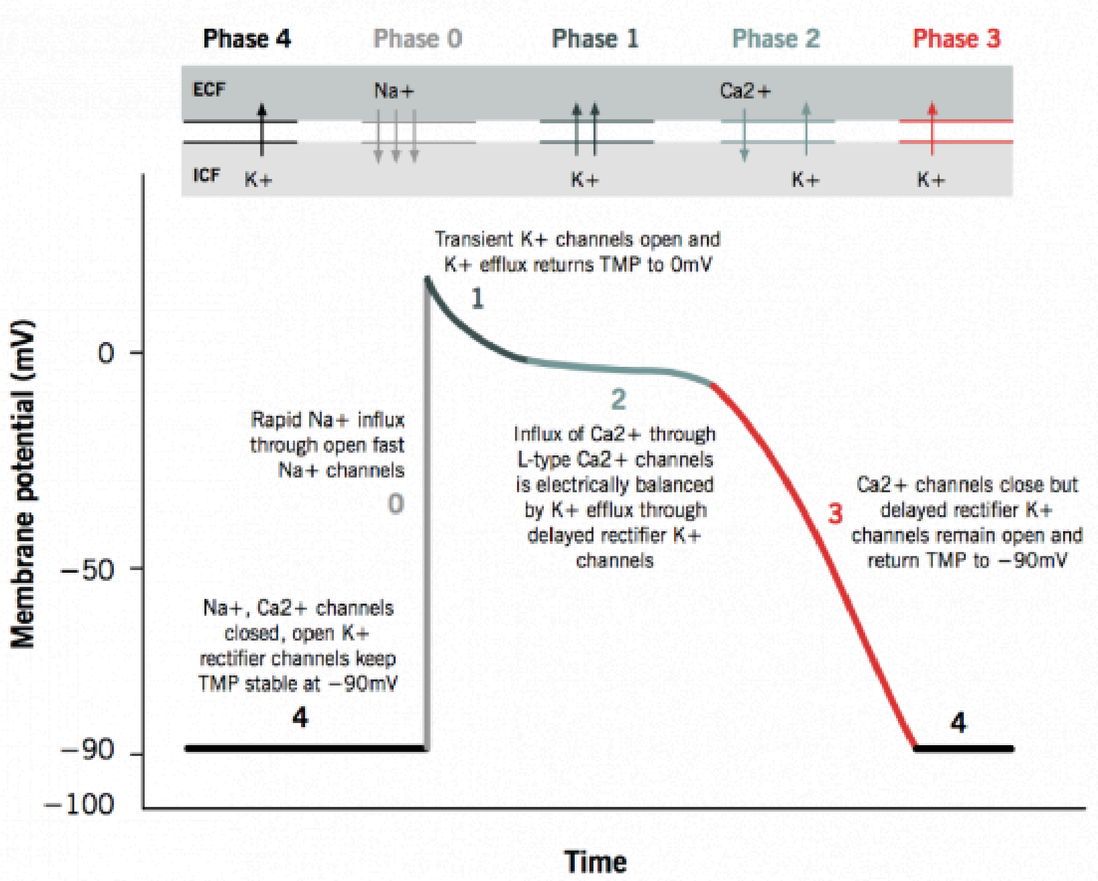
Tissue function

- **Pumps blood and transports oxygen and nutrients**: it generates the force to move blood through the heart and throughout the body.
- **Responds to hormonal and nervous stimuli**: it responds to various hormonal and nerve signals that regulate heart function

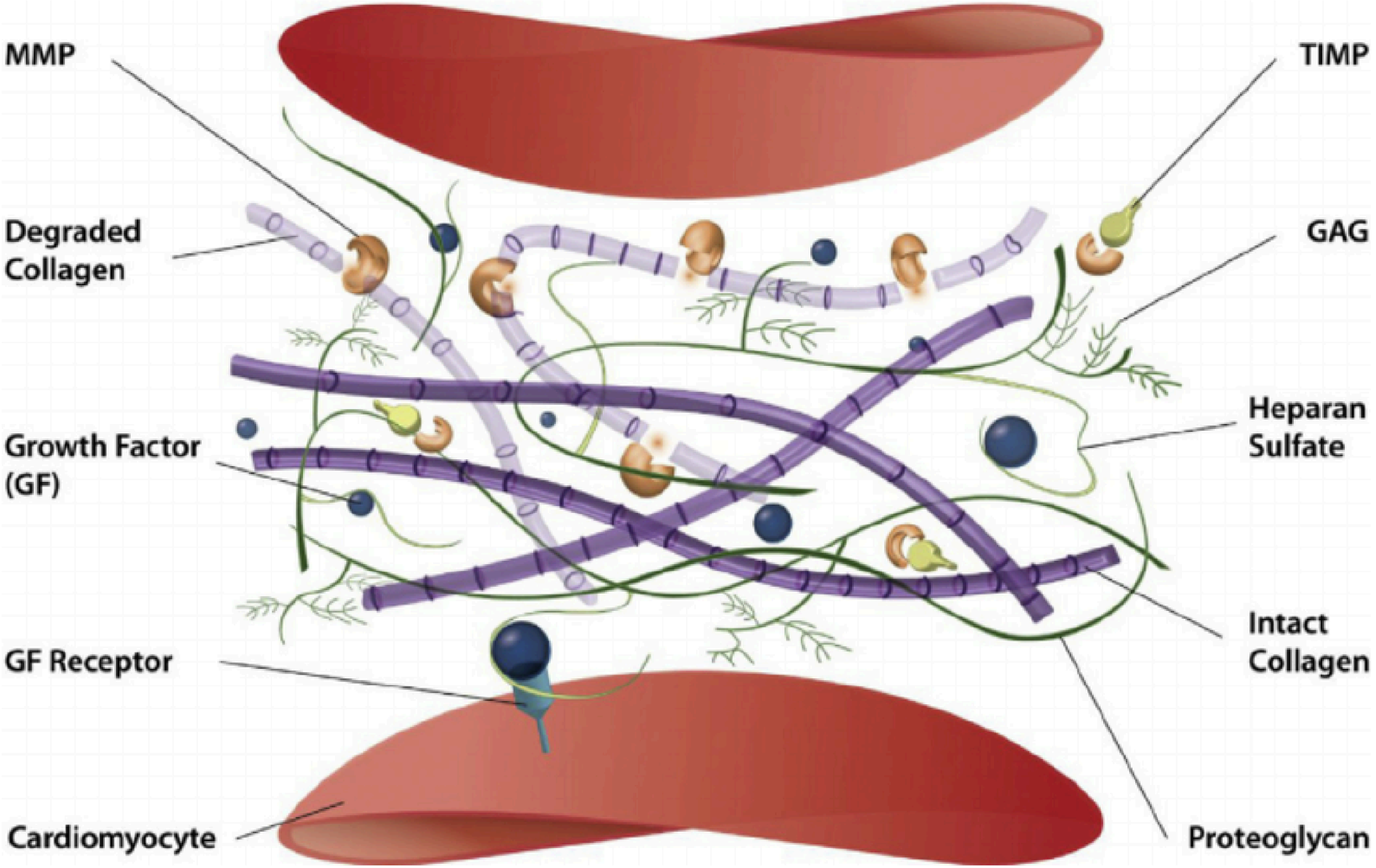


- **Regulates heart rhythm**: it generates and coordinates the electrical signals that control heart rhythm.



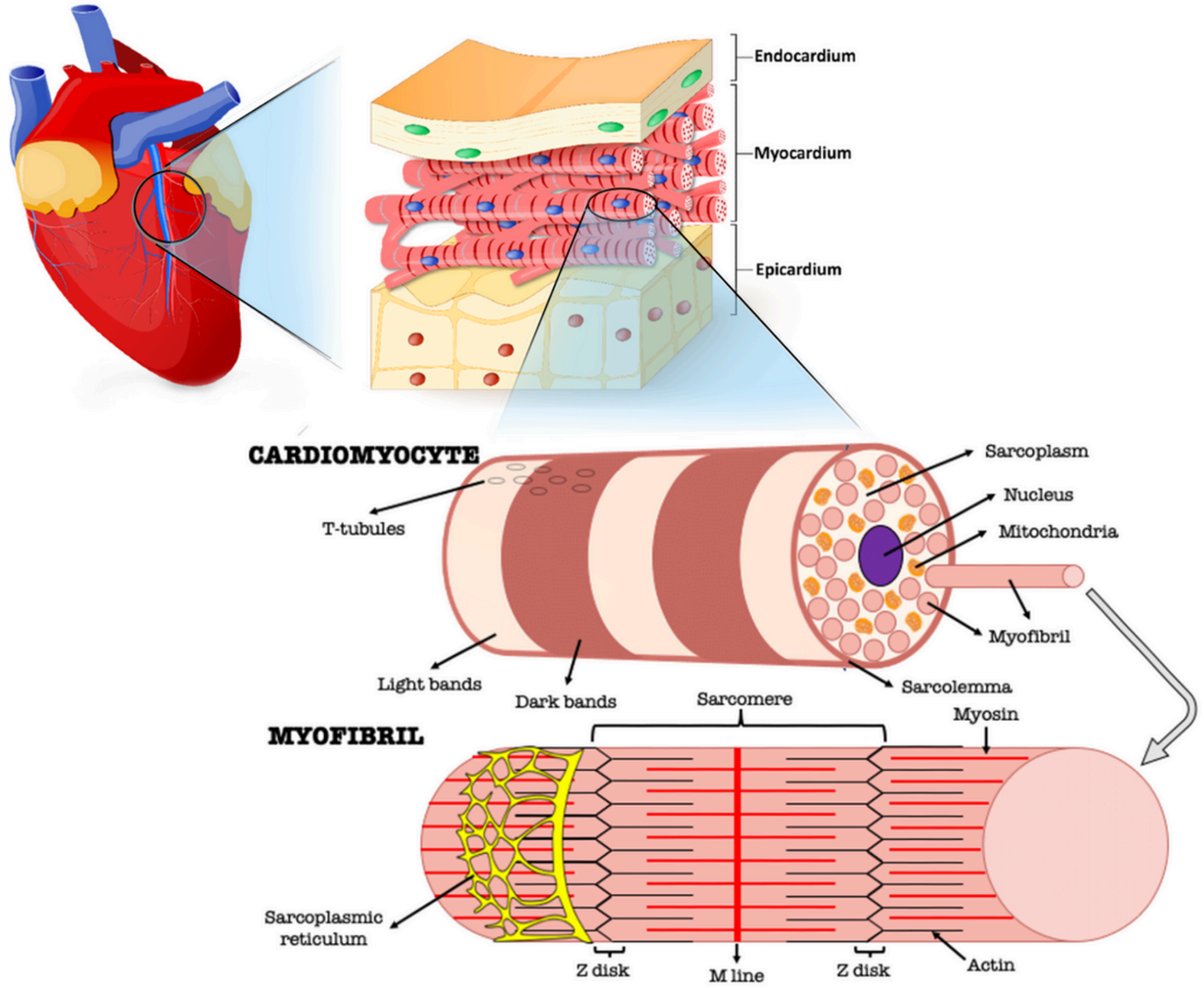
Ripa, R., George, T., Shumway, K. R., & Sattar, Y. (2021). Physiology, cardiac muscle.

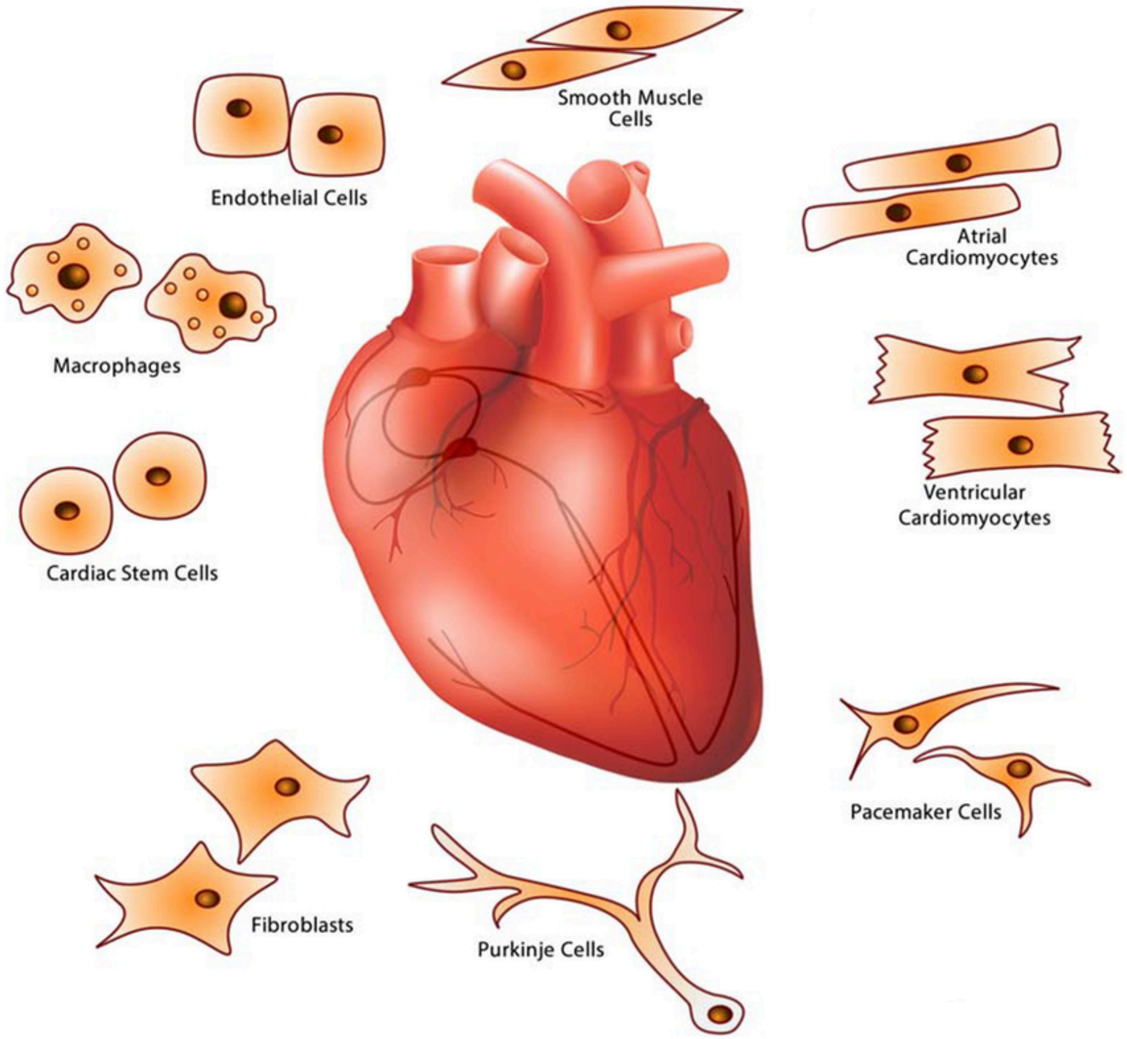
ECM composition and structure



Awada HK et al., Towards comprehensive cardiac repair and regeneration after myocardial infarction: Aspects to consider and proteins to deliver Biomaterials.
Silva AC et al., Bearing My Heart: The Role of Extracellular Matrix on Cardiac Development, Homeostasis, and Injury Response. Front Cell Dev Biol. 2021
Ringström N et al., *Framing Heartaches: The Cardiac ECM and the Effects of Age.* 2023
Broughton KM et al., *Cardiac tissue engineering therapeutic products to enhance myocardial contractility* 2020

Cell involved

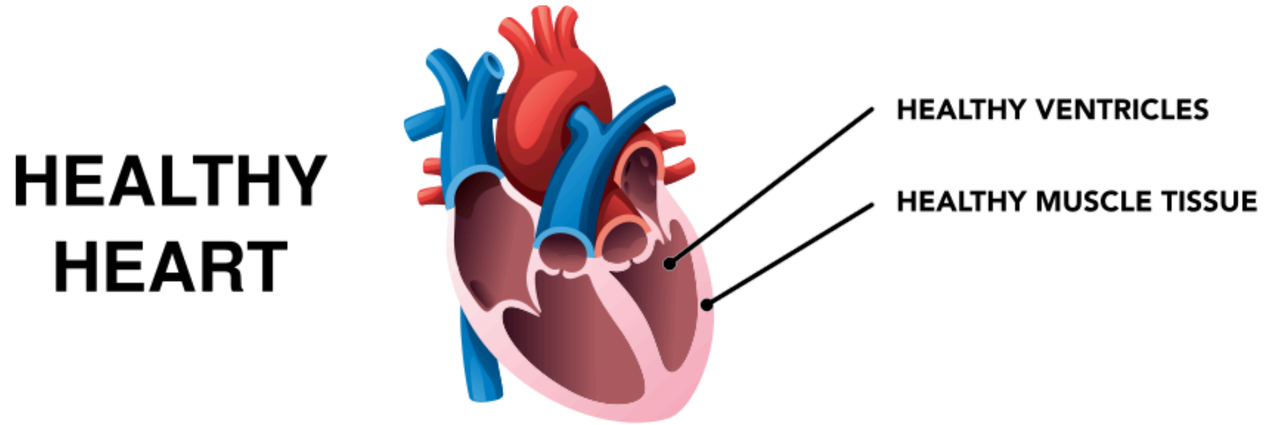


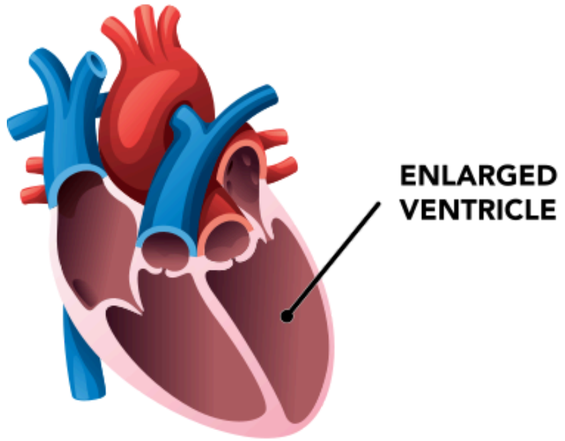


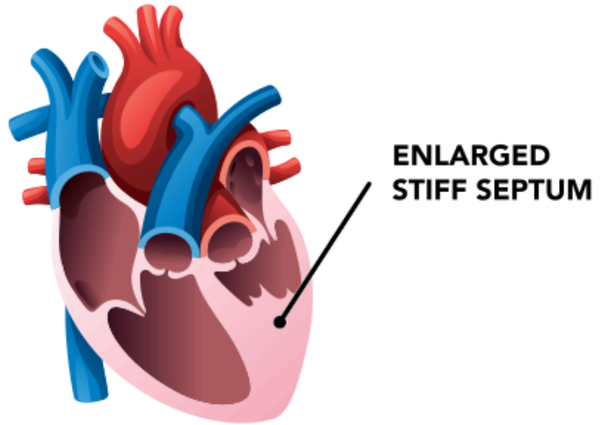
Saxton, A et al. Anatomy, thorax, cardiac muscle 2023

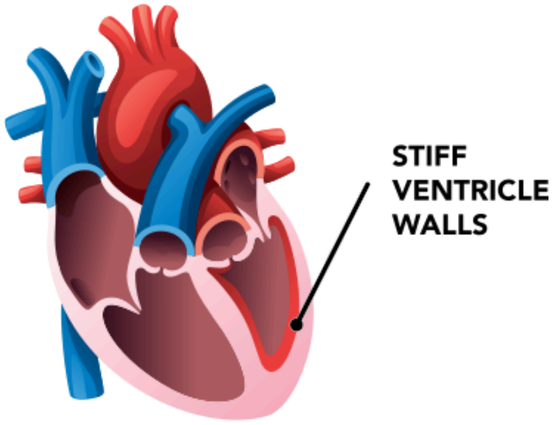
Michalak, M., & Agellon, L. B. Stress coping strategies in the heart: an integrated view 2018

Cardiomyopathy









Ciarambino et al. *Cardiomyopathies: An Overview,* 2021

FUTURE GOALS

- Support cells proliferation and adhesion
- Blood vessel formation
- Should not trigger immune cells to cause massive inflammation
- Flexibility with heart contraction
- Ensure synchronisation of electrical potential and heart rythm

Jalilinejad, N et al. Electrically conductive carbon-based (bio)-nanomaterials for cardiac tissue engineering 2023