

## Future in Bioengineering

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### Abstract

Tissue engineering provides opportunities to reconstruct living tissues and organs where significant amounts of tissue have been lost. Bioengineering has the ability to lessen these complications. Biomaterials as one of the basic compartment of bioengineering can be engrafted alone, or attend as a scaffold or carrier for cells or growth factors to the site of injury. The use of bioengineering to treat cardiovascular complications has arisen as a research focus in the past two decades. Here, we aimed to mention the overall properties of an ideal bio-scaffold which is intended to regeneration and repair of cardiovascular system. Bio-scaffolds have great prospective in cardiovascular regeneration. A bio-scaffold which is used in tissue engineering and regenerative medicine should have non-toxic, non-inflammatory, anti-microbial, anti-tumor, biocompatible and biodegradable properties. Many available bio-scaffolds in different investigations by different scientists have been evaluated for damaged tissues' replacement. The future of tissue engineering and regenerative medicine is moving toward discovery of the ideal bio-scaffolds for repair and regeneration of damaged tissues and organs.

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### Introduction

The main concern of bio-scaffold application to cardiovascular complications is the probability of generating a substrate for arrhythmia. It is said that using a bio-scaffold and probable and inevitable its interstitial diffusion may delay in left ventricle activation together with reduction in gap junction concentration at the site of damaged tissue and bio-scaffold application. This leads to arrhythmia in a moment after application of the bio-scaffold. It should be mention that the site of bio-scaffold application and the interstitial spread characteristics are other important factors in generating arrhythmias. In addition, use of bio-scaffolds with elastic and strength properties similar to the intrinsic myocardium is essential and should be noted [1]. The second concern is reducing the immune system response which inhibits the encapsulation of bio-scaffolds or related tissue. Encapsulation inhibits incorporation of the bio-scaffold to the myocardium [2]. The third concern is using conductive bio-scaffolds which assist the synchronous beating of cardiomyocytes should be considered. This harmony leads to enhancing protein

### References

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association, assists cardiomyocyte polarization, and increases electrical signal spreading [3]. The fourth concern is considering the best time for presenting bio-scaffold which is not clear. But this ideal time for bio-scaffold transplantation is necessary for reducing the immune system response and limitation of scar tissue producing.

### Conclusion

Despite these concerns, using bio-scaffold and tissue engineering investigation provides opportunities and great progress these days. It should be mentioned to use bio-scaffolds which diminish the requisite for organ replacement, reduce present unalterable side effects, and develop the quality of patients' life.

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