Opinion
Volume 12:11, 2022

Journal of Textile Science & Engineering

ISSN: 2165-8064 Open Access

Submission of Textile Skill in Tissue Manufacturing

Wanqing Zhu*

Department of Textile Composite Materials, Institute of Composite Materials, Tianjin, China

Introduction

The creation of scaffolds with properties resembling those of tissue is one of the most important aspects of tissue engineering. Textile technology has demonstrated its unique advantages when it comes to imitating human tissue properties like hierarchical, anisotropic, and strain-stiffening properties. The porosity, architecture, and mechanical properties of textile-based scaffolds are affected by textile patterns, which are essential components of textile technology. However, the effects of various textile patterns on scaffold properties and the potential of various textile patterns when fabricating textile-based scaffolds have not been thoroughly investigated. This review provides a summary of the development of textile technology and focuses on how it is used in tissue engineering to make the wider use of textile technology, particularly the various textile patterns in tissue engineering, easier. The effect of process parameters in these textile techniques on fabric properties is summarized, as is the possibility of using weaving, knitting, and braiding to imitate human tissue properties. Finally, viewpoints on possible future exploration paths are presented.

Discussion

Textile technology has recently been used by biomedical engineers to create scaffolds for tissue engineering applications. Engineers are able to customize the physical, mechanical, and biological properties of scaffolds using a variety of textile techniques, particularly weaving, knitting, and braiding. The majority of textile-based scaffolds, on the other hand, only make use of straightforward textile patterns, and the various textile patterns' effects on scaffold properties have not been thoroughly examined. The potential for various textile techniques to mimic human tissue properties is explored in this review, which examines for the first time the effect of process parameters in various textile methods on fabric properties. In the hope of facilitating new breakthroughs in textile-based tissue engineering, previous advancements in textile technology and future explorations are presented [1].

Many tissues in the human body don't have the capacity to recover, making harms to these tissues irreversible. The most common approach to repairing these damages is to use donated tissues. The aging population and a lack of organ donors, on the other hand, are increasing the number of people on the transplant waiting list. Over 100,000 people are on the National Transplant Waiting List just in the United States. Researchers in the field of tissue engineering have proposed fabricating artificial tissues that can be implanted into the human body as an alternative option to meet this crucial medical need. For the artificial tissues to have structural integrity and a suitable microenvironment for cell growth, they need a three-dimensional framework, or scaffold. The creation of scaffolds with properties resembling those of tissue is one of the most important aspects of tissue engineering. Scaffolds have been made in a variety of ways, including freeze-drying, self-assembling 3D printing, and textile technology. The most ancient of these, textile technology, has demonstrated its unique advantages in replicating human tissues' hierarchical structure as well as their anisotropic and strain-stiffening properties. Using various textile techniques like weaving, knitting, and braiding, fibers with cells or bioactive cues can be assembled into textile-based scaffolds. Additionally, the textile-based scaffolds can be made into a variety of patterns to resemble the structures and properties of various tissues [2,3].

Conclusion

Tissue engineering using textiles has received several highly regarded reviews. However, the majority of them primarily focused on the use of textile technology in various tissue engineering applications. They also did not systematically classify process parameters during textile processes and summarize their effects on scaffold properties. On the other hand, they did systematically classify process parameters during weaving, but they did not include knitting and braiding. They also did not provide a comprehensive review of textile patterns and the structure-property relationships of textile-based scaffolds. However, the effect of process parameters on the physical and mechanical properties of textile-based scaffolds has not been systematically summarized because they primarily focused on structural factors that influence cell behaviours. The effects of process parameters on scaffold properties are summarized in this review, which primarily focuses on the potential uses and applications of various textile patterns in tissue engineering. Fabricating scaffolds for tissue engineering applications has benefited greatly from textile technology. The adaptability of material examples gives the possibility to impersonate the different properties of different tissues. However, the majority of textile-based scaffolds do not explore or utilize more advanced textile patterns and instead only use straightforward textile patterns like plain weaving, weft knitting, and three-yarn braiding. Additionally, the majority of textile-based scaffolds lack the proper mechanical properties [4,5].

References

1. Hussain, Abrar, Vitali Podgursky, Dmitri Goljandin and Mart Viljus, et al. "Tribological and mechanical properties investigations of post-consumer cotton textiles." In *Solid State Phenomena*, Trans Tech Publications Ltd, 320 (2021): 97-102.
2. El-Hady, Abd, S. Sharaf and A. Farouk. "Highly hydrophobic and UV protective properties of cotton fabric using layer by layer self-assembly technique." Cellulose 27 (2020): 1099-1110.
3. Ho, Y. S., J. F. Porter and G. McKay. "Equilibrium isotherm studies for the sorption of divalent metal ions onto peat: Copper, nickel and lead single component systems." *Water Air Soil Pollut* 141 (2002): 1-33.
4. Wang, Cheng-Cai, Lain-Chuen Juang, Chung-Kung Lee and Ting-Chu Hsu, et al. "Effects of exchanged surfactant cations on the pore structure and adsorption characteristics of montmorillonite." *J Colloid Interface Sci* 280 (2004): 27-35.
5. Riaz, S., M. Ashraf, T. Hussain and M. T. Hussain, et al. "Selection and optimization of silane coupling agents to develop durable functional cotton fabrics using TiO_2 nanoparticles." *Fibers Polym* 22 (2021): 109-122.

***Address for Correspondence:** Wanqing Zhu, Department of Textile Composite Materials, Institute of Composite Materials, Tianjin, China, E-mail: WanqingZhu@dhu.edu.cn*

Received: 02 November, 2022, Manuscript No jtese-22-84799; **Editor assigned:** 04 November, 2022, PreQC No. P-84799; **Reviewed:** 16 November, 2022, QC No. Q-84799; **Revised:** 21 November, 2022, Manuscript No. R-84799; **Published:** 28 November, 2022, DOI: 10.37421/2165-8064.2022.12.512

How to cite this article: Zhu, Wanqing. "Submission of Textile Skill in Tissue Manufacturing." J Textile Sci Eng 12 (2022): 512.