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An update on technical method of cartilage decellularization: (a physical-based protocol)

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making them more suitable for use in tissue engineering and regenerative medicine applications. Non-chemical protocols for decellularization can also reduce the risk of immune rejection when used in transplantation, as they eliminate the need for harsh chemical agents that can cause tissue damage and inflammation. Additionally, non-chemical protocols can be more cost-effective and environmentally friendly than chemical protocols, as they may require fewer reagents and generate less hazardous waste.

Conclusions

Preservation of the natural elements of the ECM can serve as a viable platform to explore cell behavior. Furthermore, the decellularized scaffolds can be employed as bioinks in 3D bioprinting or hydrogel fabrication. However, the success of this strategy depends on various factors, including tissue density and thickness, and the effectiveness of the decellularization procedure. Here, we developed a streamlined decellularization protocol for cartilage by using a combination of freezing-thawing and sonication without any chemical detergent. The resulting decellularized constructs have the potential to serve as effective graft alternatives for the regeneration of cartilage and the treatment of osteoarthritis or cartilage damage. Furthermore, a detergent-free technique can be employed to utilize cartilage fragments as scaffolds for cell sheet technology, which presents an invaluable asset for exploring regenerative medicine and tissue engineering.

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Ethical statement