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Electroconductive Scaffold
Improve peripheral nerve regeneration

Nanoparticle-based Nanosystems
A carrier in osteoarthritis treatment and diagnosis

Injectable Hydrogel
Application in complex structures and various injuries

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Electrical stimulation is a promising approach to promote peripheral nerve regeneration. However, whether a single proximal electrical stimulation can directly polarize macrophages towards a regenerative phenotype and thereby remodel the nerve environment remains unclear. This issue features a study utilizing an electrically conductive scaffold (PCL/SF fiber with PPy coating) to stimulate crushed sacral nerves in rats. The results demonstrate that a single round of electrical stimulation can effectively polarize macrophages towards a pro-regenerative state. The cover image visually depicts the scaffold morphology and the shift in macrophage polarization.

Biomaterials Translational is an international journal publishing research at the interface of translational medicine, biomaterials science and engineering. The journal publishes original, high-quality, peer-reviewed papers including original research articles, reviews, viewpoints and comments. Translational medicine is an interdisciplinary field that applies emerging new technologies and sciences to the prevention, diagnosis and treatment of human disease, with a particular focus on animal disease models in the application of biomaterials for treatments. Thus, the journal highlights breakthrough discoveries in basic science and clinical application of biomaterials, as well as other significant findings related to the translation of biomaterials.

The scope of the journal covers a wide range of physical, biological and chemical sciences that underpin the design of biomaterials and the clinical disciplines in which they are used.

Original articles will be considered for publication within, but not limited to, the following domains:

- Investigation of human biology and pathogenesis of diseases with potential applications of biomaterials in treatment
- Synthesis, characterization and biomedical potential of metallic, ceramic, polymeric, composite and hybrid biomaterials
- Physical, chemical, biological, pharmaceutical and toxicological features of biomaterials
- Drug and gene delivery system design, with a focus on its application to disease conditions
- Short-term and long-term biocompatibility of biomaterials
- *In vivo* disease models and the biology of the host response in application of novel biomaterials
- Biomaterials design for modern diagnosis and therapeutic clinical practice (bioimaging, biosensing, biotherapy)
- Stem cell–biomaterial-based tissue engineering

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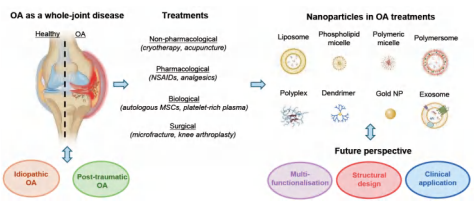
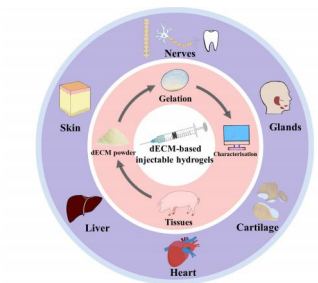
EDITORIAL

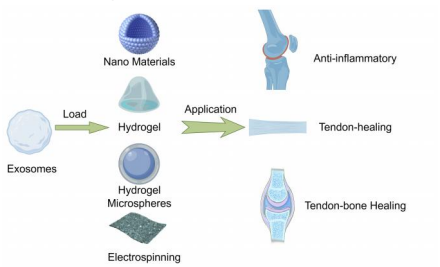
REVIEWS



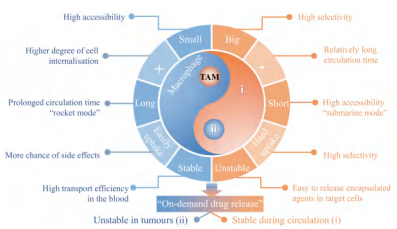
In this review, we begin by outlining the pathogenesis of osteoarthritis (OA) and the treatments currently available. We then highlight recent advances in the utilisation of nanoparticles as a drug delivery platform for OA therapy and diagnosis. The review concludes with our perspective on the challenges faced and future directions in this rapidly evolving field.



Schematic representation of decellularised extracellular matrix (dECM)-based injectable hydrogels for tissue engineering applications. dECM is an exquisite biomaterial that has attracted considerable attention from tissue engineering researchers. And dECM-based injectable hydrogels hold great promise for application in complex organ structures and various tissue injury models.

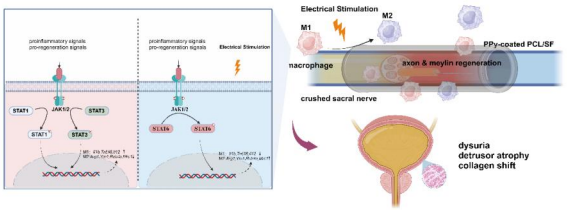


Conceptual diagram of exosome-based biomaterials in tendon/ligament repair. Exosome-based biomaterials mainly contain hydrogel microspheres, nanomaterials, hydrogels, and electrospinning, and they exert anti-inflammatory effects, promote tendon healing and tendon-bone healing. Created with Figdraw.

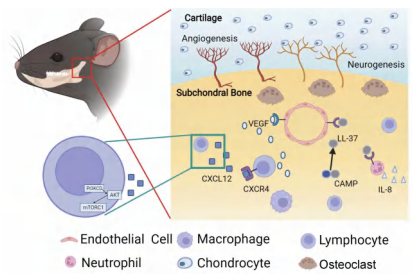


Both "*Yin*" and "*Yang*" of each physicochemical properties have pros and cons for drug delivery, the balance of which should be considered before the final design. An ideal drug delivery system should be stable during circulation (i), while unstable when reach target tumour issues and cells (ii). Macrophages act as a major limitation for nanotherapeutic delivery, while tumour-associated macrophages (TAM) might be utilized for drug delivery, as "*Yin* is within, but not against *Yang*".

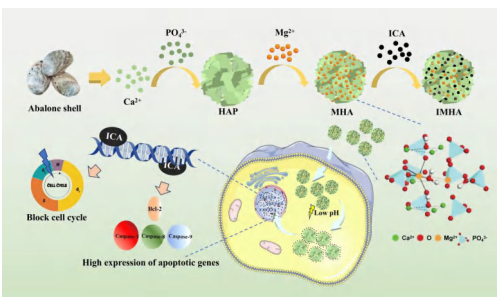
Research Articles



Our work described construction and authentication of polyprrole (PPy)-coated polycaprolactone (PCL)/silk fibroin (SF) scaffold for electrical stimulation over crushed sacral nerves. The electrical stimulation boosted nerve regeneration by polarising the macrophages towards the M2 phenotype. Bioinformatics analysis showed that signal transducer and activator of transcription (STAT) expressions were differentially regulated in a way that promoted M2-related genes expression.



The osteoarthritic pain in the temporomandibular joint is due to the interaction among angiogenesis, neurogenesis and inflammation at subchondral bone. Several signal transductions, including mammalian target of rapamycin/nuclear factor-κB/tumour necrosis factor signalling and phosphoinositide 3-kinase-protein kinase B/vascular endothelial growth factor/hypoxia-inducible factor 1 signalling, may be the efficient targets for curing temporomandibular joint osteoarthritis. And phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit delta (*Pi3kcd*), cathelicidin antimicrobial peptide (*Camp*), C-X-C motif chemokine receptor 4 (*Cxcr4*), and MYB proto-oncogene transcription factor (*Myb*) appear to play important roles in the signal interactions.



Mg^{2+}-doped abalone shell-derived mesoporous hydroxyapatite microspheres (MHA) for dual stable release of Mg^{2+} and icariin (IMHA) and application in drug delivery and tumour therapy by stimulating rapid proliferation of bone marrow mesenchymal stem cells and inducing high expression of apoptotic genes in osteosarcoma cells (MG63).

Commentaries

Corrigendum