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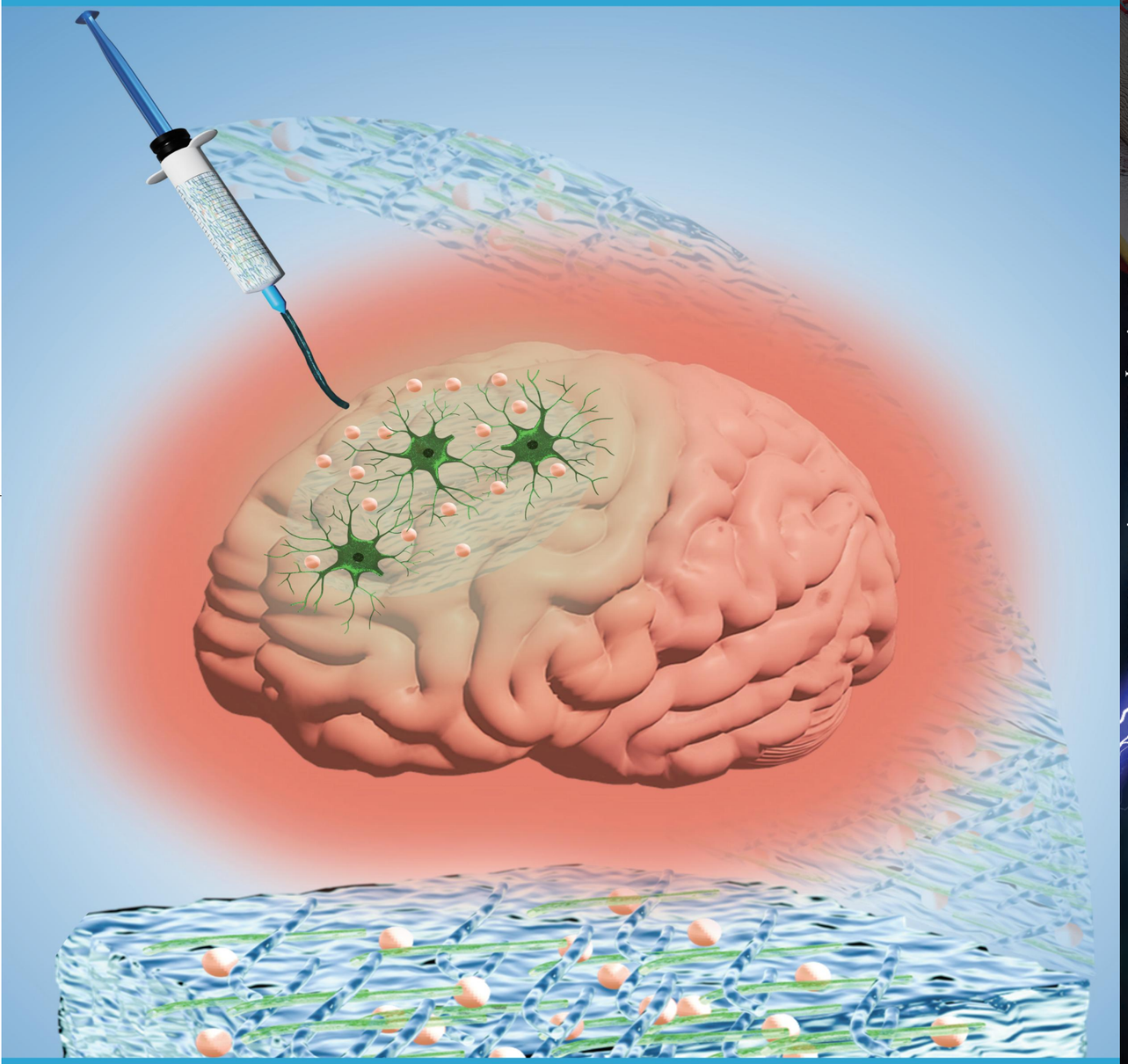

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VOL 05

生物材料转化电子杂志（英文）
Volume 5 Issue 3 September 2024

Hydrogel microspheres
Comprehensive regulation of bone regeneration microenvironment

Body temperature responsive hydrogels
Long-term anti-inflammation at cranial defects

Hydrogel microsphere delivery carriers
Effective therapeutic delivery carriers to enhance tissue regeneration in regenerative medicine

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Contact
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99 Shangda Road, Baoshan District, Shanghai, China
Email: editors@biomat-trans.com
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Biomaterials Translational is an electronic journal, which will be printed on demand of readers.

The bone regeneration microenvironment, comprising physiological, chemical, and physical microenvironments, is critical to bone regeneration process. The cover shows hydrogel microspheres (HMS) modulating the physiological microenvironment by releasing bioactives that modulate the functional expression of osteoblasts, endothelial cells, and neuronal cells while improving local oxygen and acid-base conditions in the chemical microenvironment. Besides HMS modulate the physical microenvironment by integrating physical signals such as ultrasound, near-infrared, and electric stimulus. Therefore, the HMS system is expected to promote bone regeneration by integrally modulating bone regeneration microenvironment.

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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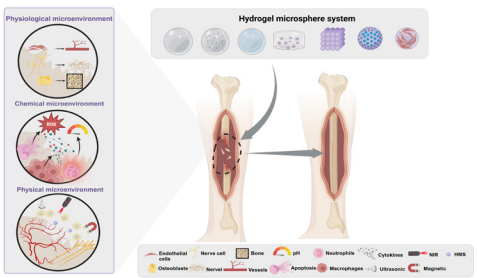
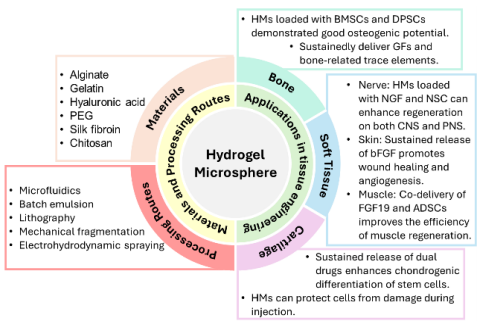
EDITORIAL

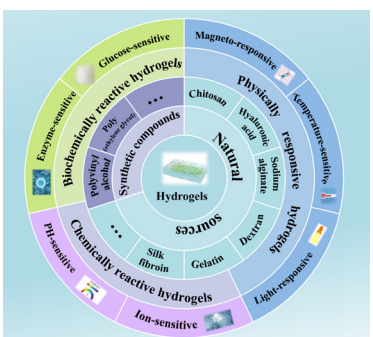
REVIEWS



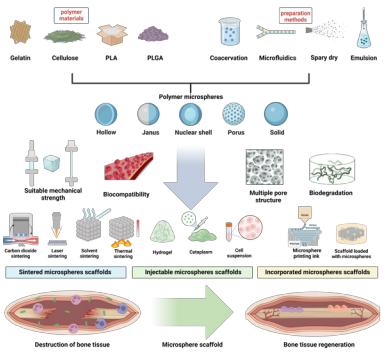
Hydrogel microspheres (HMS) system promotes bone regeneration by participating in the regulation of the physiological, chemical and physical microenvironment of bone regeneration.



The material characteristics, processing routes along with the applications of hydrogel microspheres as cell and drug delivery carriers for bone, cartilage, nerve, skin, and muscle tissue regeneration have been summarised and discussed.

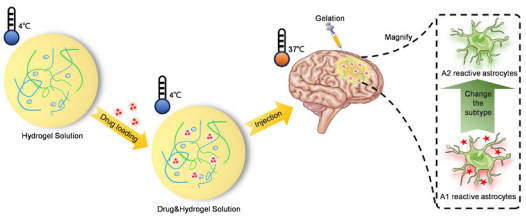


According to the different stimuli-responsive types, they were classified into three categories: physical, chemical and biochemical responses, and the applications of different stimuli-responsive hydrogels in bone tissue engineering were summarised.

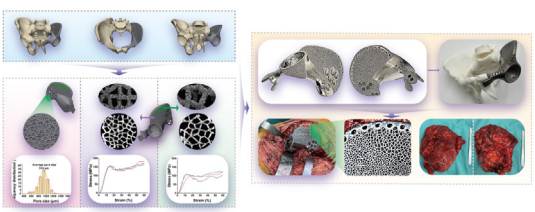


Through the selection of materials and preparation methods, polymer microspheres with different structures and functions can be obtained, and then different stacking systems can be used to construct different types of microsphere scaffolds to achieve bone tissue regeneration and repair.

Research Articles



A novel strategy for the treatment of encephalitis. Encapsulation of dexmedetomidine in liposomes to form nanomedicines, loading using an injectable thermosensitive hydrogel system, targeting and sustained release of the drug in the intracerebral environment by injecting into cranial defects for the treatment of encephalitis through inhibition of neuroinflammation and modulation of astrocyte subtypes in the central nervous system.



This study presents the design and application of a novel biomimetic hemipelvic prosthesis using the Voronoi diagram method. The approach provides wide pore size distribution, adequate mechanical properties, favourable osseointegration, and satisfactory function.

Commentaries