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Extracellular Vesicles

Clinical application in orthopaedic diseases

Hydrogel Biomaterials

Pathological mechanisms of diabetic wound healing

Nanotube Arrays

Surface nanopographies on cellular response

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Titanium dioxide nanotube array can be readily fabricated with controlled surface topography at the nanometre scale, which offers an ideal model scaffold to study how the surface topography and surface energy influence the cellular behaviours. This is reported by Monchupa Kingsak et al. in their Research Article on page 221.

Cover image: by Florence R. Wang

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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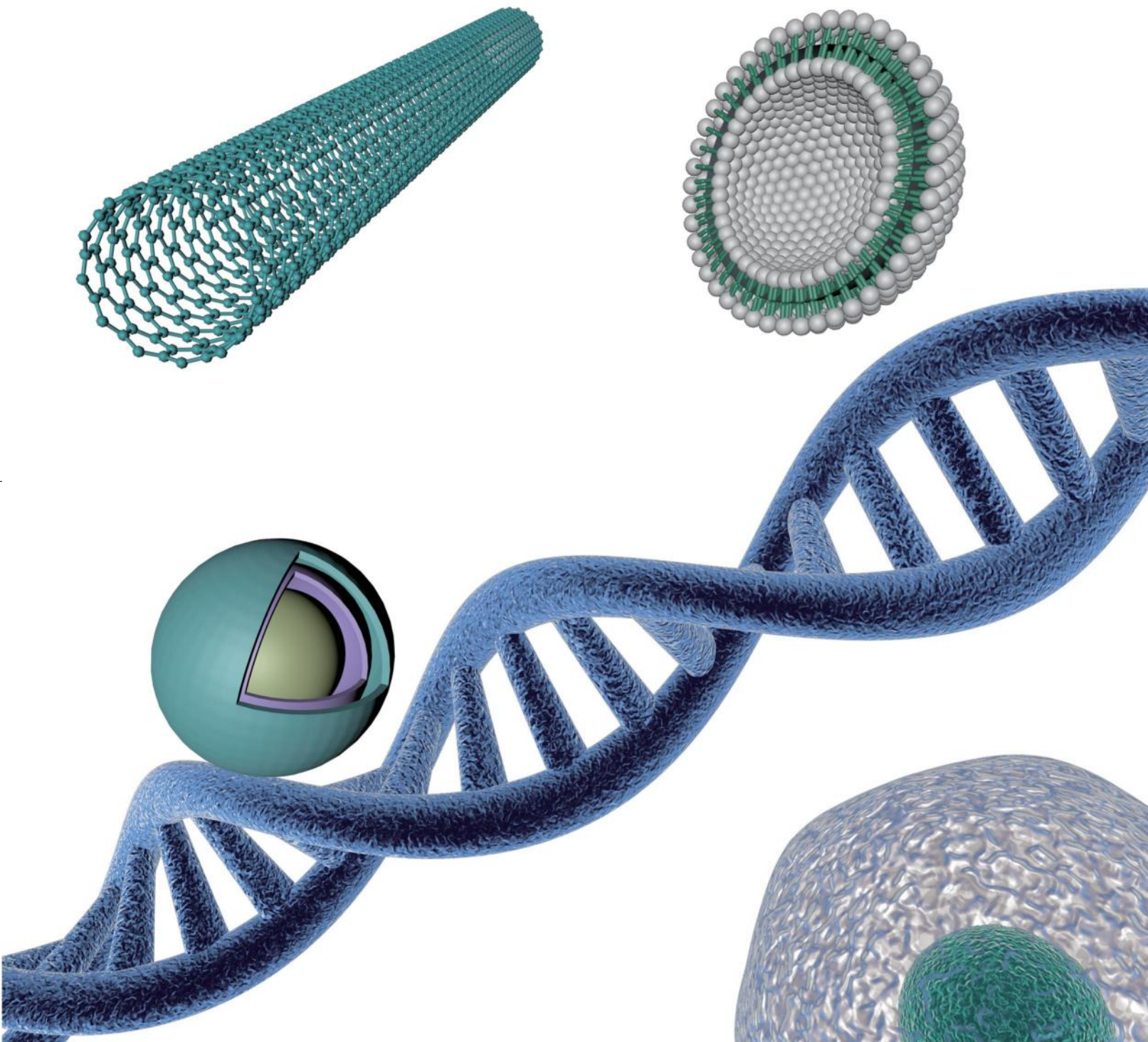
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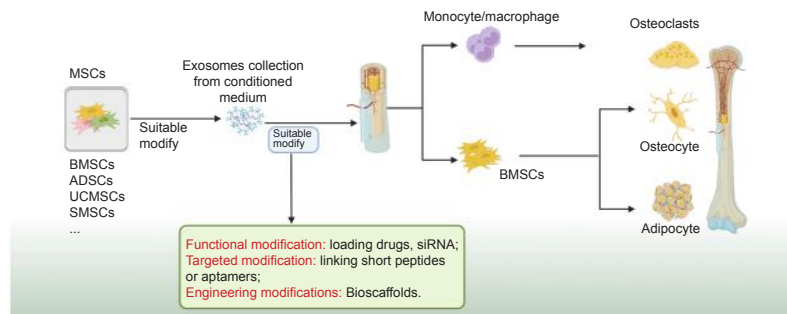


EDITORIAL

- 173 **A milestone towards a successful scientific journal: celebrating the inclusion of *Biomaterials Translational* by PubMed**
Qian Wang

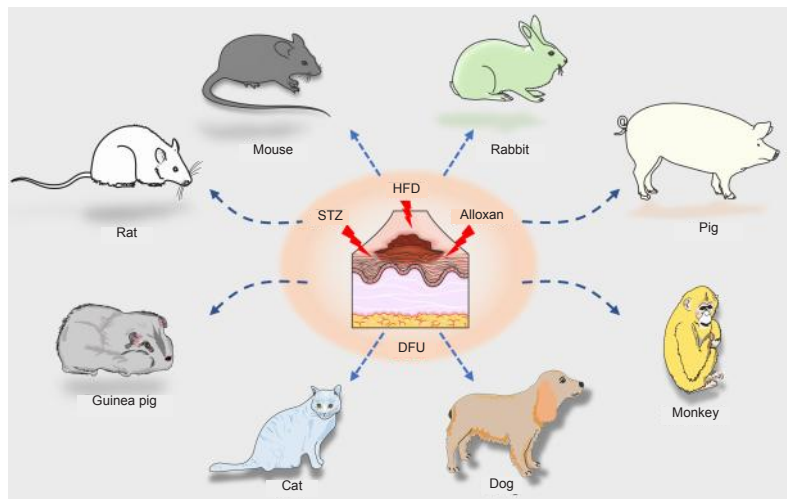
REVIEWS

- 175 **Mesenchymal stem cell-derived extracellular vesicles: a possible therapeutic strategy for orthopaedic diseases: a narrative review**
Zhao-Lin Zeng, Hui Xie



Mesenchymal stem cell-derived extracellular vesicles (MSC-EVs) have great prospects for application in orthopaedic diseases by transporting substances such as proteins, lipids, and nucleic acids. The use of modified MSC-EVs combined with materials science can realise cell-free treatment of bone diseases.

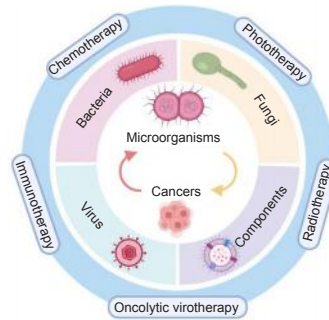
- 188 **Advances and perspective on animal models and hydrogel biomaterials for diabetic wound healing**
Yiqiang Hu, Yuan Xiong, Ranyang Tao, Hang Xue, Lang Chen, Ze Lin, Adriana C. Panayi, Bobin Mi, Guohui Liu



Diabetic wound models are induced in different animals including rat, mouse, rabbit, pig, monkey, dog, cat and guinea pig with streptozotocin (STZ), high-fat diet (HFD) and alloxan. These diabetic wound models were used can be simulated the physiological mechanism of diabetic wounds, which providing a theory for translational research in treating diabetic wound healing.

201 **Engineered microorganisms-based delivery systems for targeted cancer therapy: a narrative review**

Xin Huang, Haoyu Guo, Lutong Wang, Zengwu Shao

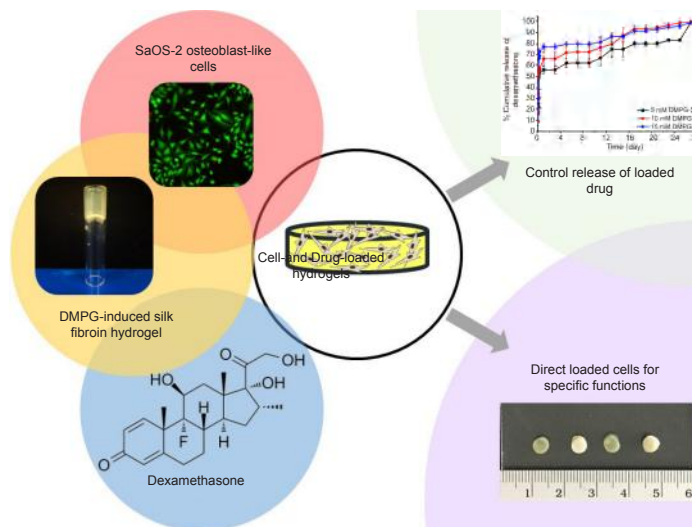


To investigate the developments of engineered microorganisms-based delivery systems for targeted cancer therapy, this review concluded the main types and characteristics of microorganisms such as bacteria, viruses, fungi, microalgae, and their components. Moreover, innovative attempts and therapies such as chemotherapy, phototherapy, immunotherapy, radiotherapy, and oncolytic virotherapy were further concluded.

RESEARCH ARTICLES

213 **Osteogenic differentiation of encapsulated cells in dexamethasone-loaded phospholipid-induced silk fibroin hydrogels**

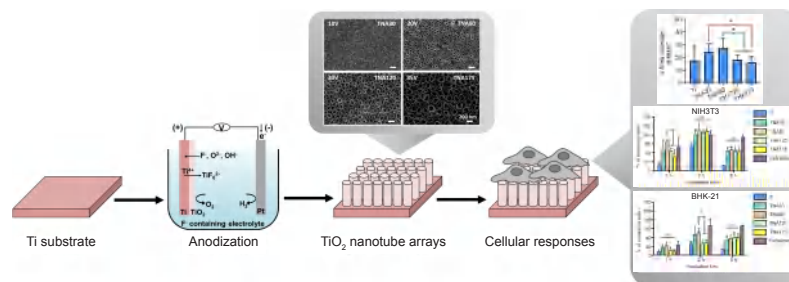
Chavee Laomeephol, Helena Ferreira, Sorada Kanokpanont, Jittima Amie Luckanagul, Nuno M Neves, Siriporn Damrongsakkul



Cell- and drug-loaded hydrogels were developed based on phospholipid-induced silk fibroin hydrogels to serve as scaffolds conforming to tissue-engineering concepts. The controlled release of drug loaded in the hydrogels was shown to promote the osteogenic differentiation of encapsulated cells. The dual encapsulation could synergise in enhancing cellular activities.

221 **Cellular responses to nanoscale substrate topography of TiO₂ nanotube arrays: cell morphology and adhesion**

Monchupa Kingsak, Panita Maturavongsadit, Hong Jiang, Qian Wang



The comprehensive assessment of cell adhesion on well-defined and controllable titanium dioxide (TiO₂) nanotube arrays with a wide range of pore sizes. An 80-nm pore size of TiO₂ nanotube arrays (TNAs) showed a promising effect on cell adhesion, and pore sizes of 30 and 80 nm enhanced cell spreading and percentage cell area coverage.