Biomaterials Translational

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Volume 2 Issue 1 March 2021

COVID-19:

Challenges and Opportunities to Biomaterials Science and Translational Medicine

Respiratory Droplets
Main carrier for COVID-19 transmission

Biomaterial Source for Diagnosis
Plant-produced recombinant SARS-CoV-2 receptor-binding domain

Enveloped Viruses in Indoor
Fate and transport of microbes in indoor built spaces

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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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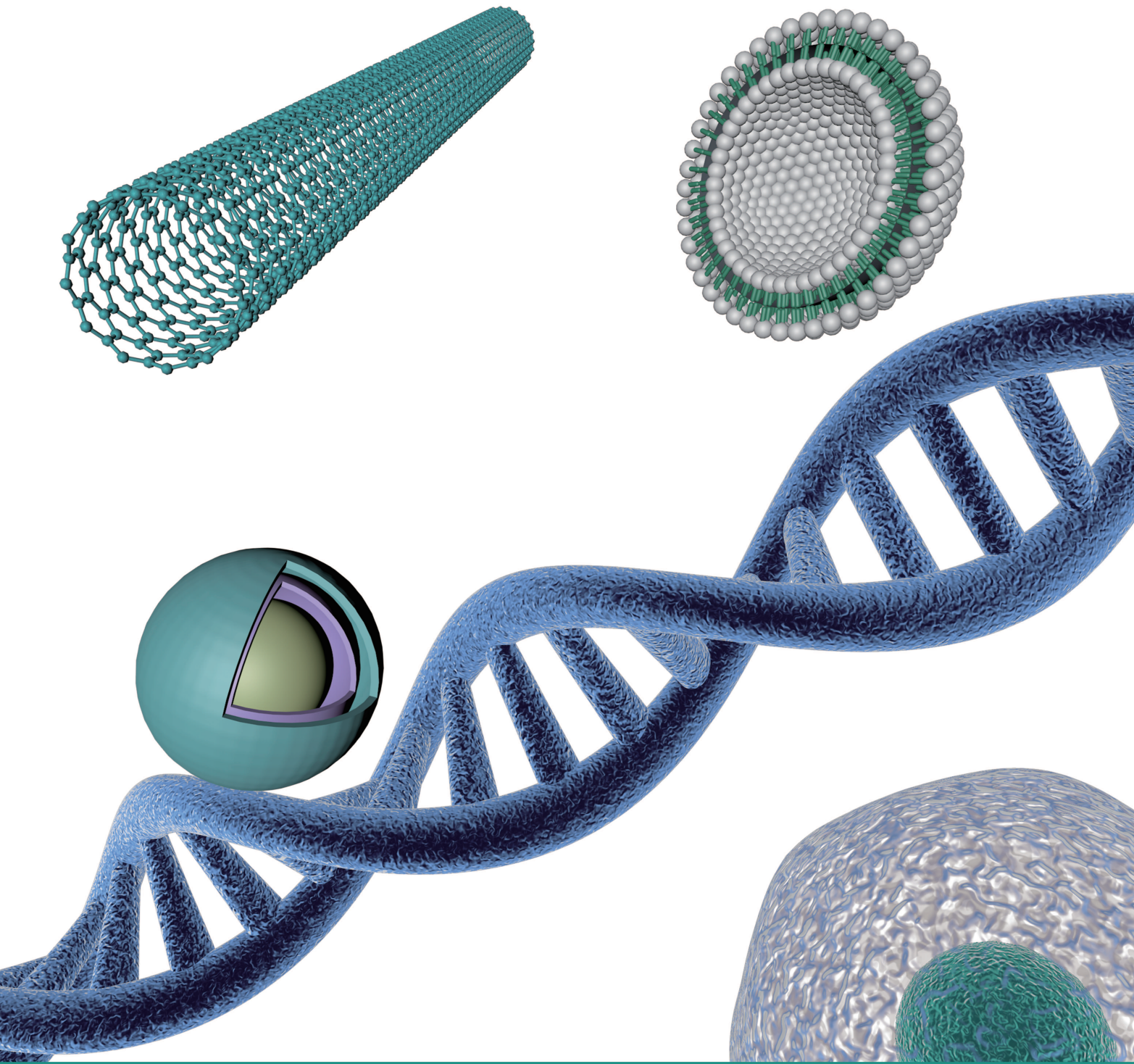

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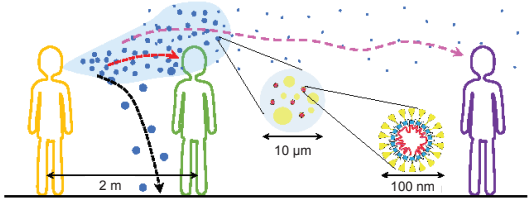
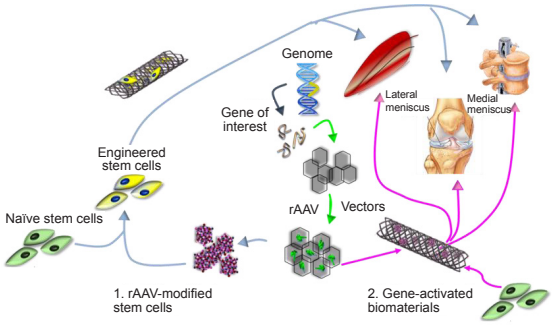
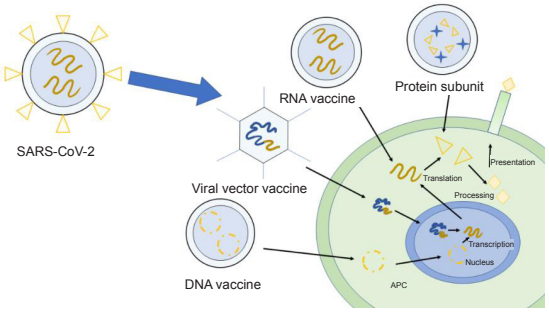
Special Issue



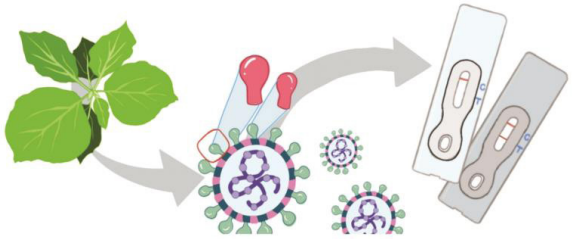
The coronavirus causing COVID-19 relies on respiratory droplets as the main carrier for its transmission. Understanding the physical characteristics of respiratory droplets and their fate after being released into air plays a crucial role in helping develop mitigating measures and policies to fight the ongoing pandemic that plagues the world.



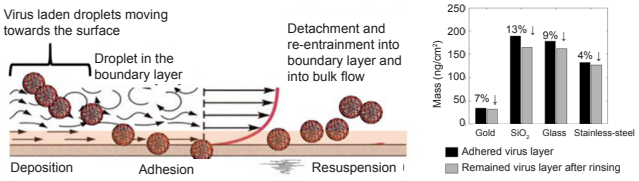
A schematic diagram illustrating recombinant adeno-associated viral (rAAV)-based gene therapy combined with a tissue-engineered biomaterial scaffold. rAAV-modified stem cells and gene-activated biomaterials can be applied to bone, vertebral disc, cartilage or muscle to treat multiple musculoskeletal disorders.



Four vaccine types derived from the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus are depicted, namely, DNA-based, viral vector, RNA-based, and protein subunit vaccines. Vaccine uptake, processing, and presentation by an antigen-presenting cell (APC) are also illustrated for these four vaccine mechanisms.

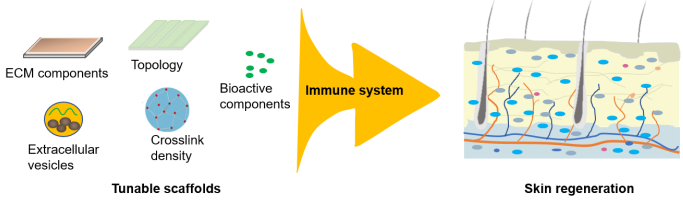


Plant-produced recombinant severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) receptor-binding domain (RBD) was used to develop a lateral flow immunoassay strip (LFIA) for detecting IgM/IgG antibodies.

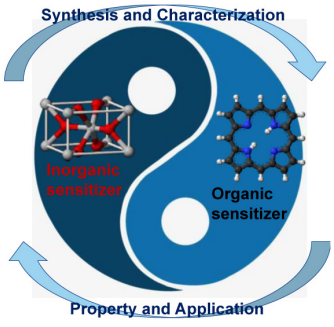


To limit transmission due to infectious droplets we must understand, "What factors control the transport, deposition, adhesion, and persistence of pathogens indoors?" The pandemic has reinforced the necessity of establishing baseline information on how viruses under indoor environmental conditions optimize survivability and transmission. Virus-surface interactions investigations using vaccinia virus sheds light on part of the picture.

REVIEWS



The immune system plays significant roles in tissue engineering and regenerative medicine. The immunomodulatory potential of biomaterial scaffolds can be achieved by tailoring their chemical, physical and biological properties. Engineering immune-responsive pro-regenerative biomaterial scaffolds would greatly advance cutaneous wound healing.



This review article highlights representative research progress on the development of porphyrin and titanium dioxide sonosensitizers for sonodynamic cancer therapy. These sonosensitizers are rationally designed according to inherent characteristics of the tumour microenvironment in order to achieve efficient therapeutic outcome, demonstrating their promising application potential in the cancer treatment.