nature biomedical engineering

1st ANNIVERSARY

In the first anniversary of the launch of *Nature Biomedical Engineering*, the editors have selected 10 pieces of content that exemplify the interdisciplinarity of the subject area and the need for closer collaboration between bench researchers, clinicians and medical engineers to solve outstanding health challenges. All 10 articles are free to read for one month.

Designing nanomedicine for immuno-oncology

Drawing from recent successes in cancer immunotherapy, this Perspective discusses that effective cancer-nanomedicine therapies can be designed to prime antitumour immunity far from the site of disease.

Glial responses to implanted electrodes in the brain

This Review discusses the role of glia as an effector of the performance and integration of devices implanted in the brain, and the implications of this for device development.

Light-sheet microscopy for slide-free non-destructive pathology of large clinical specimens

A light-sheet microscope images large surgical and biopsy specimens non-destructively over large fields of view in two and three dimensions, with the same level of detail as traditional slide-based histopathology.

Rapid intraoperative histology of unprocessed surgical specimens via fibre-laser-based stimulated Raman scattering microscopy

By taking advantage of stimulated Raman spectroscopy and fibre-laser technology, virtual histology images can be obtained in real time in the operating room, with diagnostic quality comparable with that achieved via conventional histopathology.

***In situ* activation of platelets with checkpoint inhibitors for post-surgical cancer immunotherapy**

By targeting the surgical bed and circulating tumour cells, platelets conjugated with an antibody against an immune checkpoint protein prevent tumour recurrence and metastasis following resection of the primary tumour.

Fast-forming hydrogel with ultralow polymeric content as an artificial vitreous body

A hydrogel made of crosslinked clusters of highly branched polymers that has ultralow swelling pressure and that forms in 10 minutes despite its low polymer content functions as an artificial vitreous body for over one year without inducing adverse effects.

Single-impulse panoramic photoacoustic computed tomography of small-animal whole-body dynamics at high spatiotemporal resolution

Single-impulse photoacoustic computed tomography can, at deep penetration and high resolution and contrast, image the whole-body dynamics of small animals in real time, and track injected cancer cells and image the vasculature of whole rat brains.

Localization of microscale devices in vivo using addressable transmitters operated as magnetic spins

The location of microdevices in the body of anaesthetized mice can be retrieved with sub-millimetre precision by adopting principles from nuclear magnetic resonance.

Capacitively coupled arrays of multiplexed flexible silicon transistors for long-term cardiac electrophysiology

Capacitive coupling between tissue and flexible integrated electronics through a sealing dielectric layer facilitates long-term electrophysiology measurements, as demonstrated in *ex vivo* Langendorff heart models.

Nanoparticle delivery of Cas9 ribonucleoprotein and donor DNA in vivo induces homology-directed DNA repair

Gold nanoparticles carrying Cas9 ribonucleoprotein and donor DNA, and complexed with endosomal disruptive polymers, correct the DNA mutation that causes Duchenne muscular dystrophy in mice, with minimal off-target effects.