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POLYMETRIC BIOMATERIALS & TISSUE ENGINEERING

BIOACTIVE SCAFFOLDS

Tissue engineering and 3D surface functionalization

Composite polymeric scaffolds

Conductive scaffolds

Injectable microspheres for tissue regeneration

Growth factor delivery



J Colloid and Interface Sci 518:252-262 (2018).
Biomater 156:40-50 (2018).
Acta Biomater 68:190-203 (2018).
Biomater 131:86-97 (2017).
ACS Nano 11:5646-5659 (2017).
Acta Biomater 59:68-81 (2017).
Adv Funct Mat 25(3):350-360 (2015).
J Mat Chem B, 2:6119-6130 (2014).
Pharm Res 28(6):1273-1281 (2011).

REGENERATION OF 3D FUNCTIONAL TISSUE

Polymer-cell interactions and signal and substrate requirements

Protein and pathway functions in tissue regeneration

MiRNA effects on tumorigenesis and angiogenesis

Scaffold morphology and osteogenesis

Conductive materials and myogenesis



Bone Res 6(1):10 (2018).
Biomacromol 18 (9), 2808-2819 (2017).
Cancer Lett 397: 111-119 (2017).
Biomater 87, 18-31 (2016).
J Cell Biochem 117(7):1556-1567 (2016).
ACS Appl Mat Interfaces 9(35): 29595-29611 (2017).
Biomater 31(21):5526-5535 (2010).

PHASE-SEPARATION

Thermally-induced phase separation for 3D ordered structure formation



Porous, nanofibrous scaffolds

Channeled, nanofibrous scaffolds

Macromol Biosci 12(6): 761-769 (2012).
Biomater 31(2):259-269 (2010).
Biomater 30(25): 4094- 4103 (2009).
Biomater 30(32): 6426-6434 (2009).

SELF-ASSEMBLY

Biomedical applications of ordered 3D structure formation at the nanometer scale

Nanofibrous microspheres

Stretchable, electroactive elastomers

Nanoclusters for cancer therapy

ACS Nano 12:2017-2026 (2018).
Carbon 116:325-337 (2017).
Macromol Rapid Comm 33(8): 664-671 (2012).
Nature Mater 10(5):398-406 (2011).
J Controlled Release 145(2):116-123 (2010).
ACS Nano 4(2): 1049-1059 (2010).
Soft Matter 6: 610-617 (2010).
Angew Chem Int Ed Engl 48(5): 964-968 (2009).



Ma Group Featured Current Projects

CONTROLLED RELEASE

Targeted, sustained, pulsatile, and environmentally responsive drug release

Featured: Long term, pulsatile drug release
Biomaterials, 114:1-9 (2017).

Environment responsive drug release

Nonviral vectors for RNA delivery

Acta Biomater. in press (2018).
Eur J Orthd, in press (2018).
Int J Bio Sci 13(12):1549-46 (2017).
Biomater 167:132-142 (2018).
ACS Appl Mater Interfaces 10:4471-4480 (2018).
Adv Biosyst 1:12 (2017).
Acta Biomater 54: 69-80 (2017).
ACS Appl Mater Interfaces 9(35): 29595-29611 (2017).



BIOMIMETIC MATERIALS

Novel and synthetic materials inspired by natural materials

Self-healing hydrogels

Materials for immune-mediate tissue regeneration

Chem Mater 30(5):1729-1742 (2018).
Biomater 30(12): 2252-2258 (2009).
J Mater Chem B, 4:6644- 6651 (2016).

