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### 2018

#### **Hierarchical Biomineralization: from Nature's Designs to Synthetic Materials for Regenerative Medicine and Dentistry.**

Elsharkawy S and Mata A. *Adv Healthc Mater.*

#### **Protein disorder-order interplay to guide the growth of hierarchical mineralized structures.**

Elsharkawy S, Al-Jawad M, Pantano MF, Tejada-Montes E, Mehta K, Jamal H, Agarwal S, Shuturminska K, Rice A, Tarakina NV, Wilson RM, Bushby AJ, Alonso M, Rodriguez-Cabello JC, Barbieri E, Del R -o Hern -ndez A, Stevens MM, Pugno NM, Anderson P and Mata A. *Nat Commun vol. 9, (1).*

#### **Claim to FAME.**

Mata A. *Nat Chem vol. 10, (5) 485-487.*

#### **Multicomponent self-assembly as a tool to harness new properties from peptides and proteins in materials design.**

MATA A. *Chemical Society Reviews. Royal Society of Chemistry.*

#### **3D Electrophoresis-Assisted Lithography (3DEAL): 3D Molecular Printing to Create Functional Patterns and Anisotropic Hydrogels.**

Aguilar JP, Lipka M, Primo GA, Licon-Bernal EE, Fern -ndez-Pradas JM, Yaroshchuk A, Albericio F and Mata A. *Advanced Functional Materials vol. 28, (15).*

#### **A fluidic device for the controlled formation and real-time monitoring of soft membranes self-assembled at liquid interfaces.**

MATA A. *Scientific Reports. Nature Publishing Group.*

### 2017

#### **Nanostructured interfacial self-assembled peptide-polymer membranes for enhanced mineralization and cell adhesion.**

Ribeiro S, Radvar E, Shi Y, Borges J, Pirraco RP, Leonor IB, Mano JF, Reis RL, Mata   and Azevedo HS. *Nanoscale vol. 9, (36) 13670-13682.*

#### **Trauma induces overexpression of Cx43 in human fetal membrane defects.**

Barrett DW, Kethees A, Thrasivoulou C, Mata A, Virasami A, Sebire NJ, Engels AC, Deprest JA, Becker DL, David AL and Chowdhury TT. *Prenat Diagn.*

#### **Elastin-Like Protein, with Statherin Derived Peptide, Controls Fluorapatite Formation and Morphology.**

Shuturminska K, Tarakina NV, Azevedo HS, Bushby AJ, Mata A, Anderson P and Al-Jawad M. *Front Physiol vol. 8, 368-368.*

#### **Cross-linking of a biopolymer-peptide co-assembling system.**

Inostroza-Brito KE, Collin EC, Majkowska A, Elsharkawy S, Rice A, Del R -o Hern -ndez AE, Xiao X, Rodr -guez-Cabello J and Mata A. *Acta Biomater vol. 58, 80-89.*

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**Bone and cartilage differentiation of a single stem cell population driven by material interface.**

Donnelly H, Smith CA, Sweeten PE, Gadegaard N, Meek D, D'Este MD, MATA A, Eglin D and Dalby MJ. *Journal of Tissue Engineering* vol. 8, Sage Publications.

**New Bioengineering Breakthroughs and Enabling Tools in Regenerative Medicine.**

MATA A, Azevedo HS, Botto L, Gavara N and Su L. *Current Stem Cell Reports*.

**2016**

**Preferential nucleation and crystal growth on micro fabricated topography.**

Elsharkawy S, Tejada-Montes E, Al-Jawad M and MATA A. *Materials Today*.

**Connexin 43 is overexpressed in human fetal membrane defects after fetoscopic surgery.**

Barrett DW, David AL, Thrasivoulou C, Mata A, Becker DL, Engels AC, Deprest JA and CHOWDHURY TT. *Prenatal Diagnosis*.

**2015**

**Development of tailored and self-mineralizing citric acid-crosslinked hydrogels for in situ bone regeneration.**

Sánchez-Ferrero A, Mata A, Mateos-Timoneda MA, Rodríguez-Cabello JC, Alonso M, Planell J and Engel E. *Biomaterials* vol. 68, 42-53.

**Co-assembly, spatiotemporal control and morphogenesis of a hybrid protein-peptide system.**

Inostroza-Brito KE, Collin E, Sison-Mendelson O, Smith KH, Monge-Marcet A, Ferreira DS, Rodríguez RP, Alonso M, Rodríguez-Cabello JC, Reis RL, Sagués F, Botto L, Bitton R, Azevedo HS and Mata A. *Nat Chem* vol. 7, (11) 897-904.

**Injectable Hyaluronan Hydrogels with Peptide-Binding Dendrimers Modulate the Controlled Release of BMP-2 and TGF- $\beta$ 1.**

Seelbach RJ, Fransen P, Pulido D, D'Este M, Düttenhoefer F, Sauerbier S, Freiman TM, Niemeyer P, Albericio F, Alini M, Royo M, Mata A and Eglin D. *Macromol Biosci* vol. 15, (8) 1035-1044.

**Effective and durable genetic modification of human mesenchymal stem cells via controlled release of rAAV vectors from self-assembling peptide hydrogels with a maintained differentiation potency.**

Rey-Rico A, Venkatesan JK, Frisch J, Schmitt G, Monge-Marcet A, Lopez-Chicon P, Mata A, Semino C, Madry H and Cucchiari M. *Acta Biomater* vol. 18, 118-127.

**Bimolecular based heparin and self-assembling hydrogel for tissue engineering applications.**

Fernández-Muñoz T, Recha-Sancho L, López-Chicón P, Castells-Sala C, Mata A and Semino CE. *Acta Biomater* vol. 16, 35-48.

**Copper catalyst efficiency for the CuAAC synthesis of a poly(N-isopropylacrylamide) conjugated hyaluronan.**

Seelbach RJ, D'Este M, Alini M, Mata A and Eglin D. *Clin Hemorheol Microcirc* vol. 60, (1) 25-37.

**2014**

**Multivalent dendrimers presenting spatially controlled clusters of binding epitopes in thermoresponsive hyaluronan hydrogels.**

Seelbach RJ, Fransen P, Peroglio M, Pulido D, Lopez-Chicon P, Düttenhoefer F, Sauerbier S, Freiman T, Niemeyer P, Semino C, Albericio F, Alini M, Royo M, Mata A and Eglin D. *Acta Biomater* vol. 10, (10) 4340-4350.

**Mineralization and bone regeneration using a bioactive elastin-like recombinamer membrane.**

Tejada-Montes E, Klymov A, Nejadnik MR, Alonso M, Rodríguez-Cabello JC, Walboomers XF and Mata A. *Biomaterials* vol. 35, (29) 8339-8347.

**3D electrophoresis-assisted lithography (3DEAL) for patterning hydrogel environments.**

Aguilar Aleman JP, Licon Bernal EE, Fernandez Pradas JM, Yaroshchuk A, Albericio F and Mata A. *Journal of Tissue Engineering and Regenerative Medicine* vol. 8, 375-375.

**Binding epitope decorated dendrimers in thermoresponsive hyaluronic acid hydrogels influence stem cells.**

Seelbach R, Peroglio M, Fransen P, Royo M, Albericio F, Alini M, Eglin D and Mata A. *Journal of Tissue Engineering and Regenerative Medicine* vol. 8, 215-216.

**Bioactive membranes for bone regeneration applications: effect of physical and biomolecular signals on mesenchymal stem cell behavior.**

Tejeda-Montes E, Smith KH, Rebollo E, Gómez R, Alonso M, Rodriguez-Cabello JC, Engel E and Mata A. *Acta Biomater* vol. 10, (1) 134-141.

## 2013

**Fabrication of hierarchical micro-nanotopographies for cell attachment studies.**

López-Bosque MJ, Tejeda-Montes E, Cazorla M, Linacero J, Atienza Y, Smith KH, Lladó A, Colombelli J, Engel E and Mata A. *Nanotechnology* vol. 24, (25).

**Co-assembled and microfabricated bioactive membranes.**

Mendes AC, Smith KH, Tejeda-Montes E, Engel E, Reis RL, Azevedo HS and Mata A. *Advanced Functional Materials* vol. 23, (4) 430-438.

**TISSUE ENGINEERING FOR ARTICULAR CARTILAGE REPAIR - THE STATE OF THE ART.**

Johnstone B, Alini M, Cucchiari M, Dodge GR, Eglin D, Guilak F, Madry H, Mata A, Mauck RL, Semino CE and Stoddart MJ. *European Cells & Materials* vol. 25, 248-267.

## 2012

**A top-down/bottom-up strategy to develop a bioactive periosteum graft.**

Tejeda-Montes E, Smith KH, Rebollo E, Gomez R, Alonso M, Engel E and Mata A. *Journal of Tissue Engineering and Regenerative Medicine* vol. 6, 19-19.

**Spontaneous co-assembly of molecularly designed building blocks into hierarchically ordered, dynamic, hybrid macrotubes.**

Smith KH, Inostroza KE, Alonso M, Reis RL, Azevedo HS and Mata A. *Journal of Tissue Engineering and Regenerative Medicine* vol. 6, 224-225.

**Biofunctionalization of biopolymers with peptide conjugated dendrons.**

Fransen P, Pulido D, Seelbach R, Mata A, Eglin D, Royo M and Albericio F. *Journal of Peptide Science* vol. 18, S25-S25.

**Engineering membrane scaffolds with both physical and biomolecular signaling.**

Tejeda-Montes E, Smith KH, Poch M, López-Bosque MJ, Martín L, Alonso M, Engel E and Mata A. *Acta Biomaterialia* vol. 8, (3) 998-1009.

**Design of biomolecules for nanoengineered biomaterials for regenerative medicine.**

Mata A, Palmer L, Tejeda-Montes E and Stupp SI. *Methods in Molecular Biology* vol. 811, 39-49.

## 2011

**Preparation and characterization of glutaraldehyde-cross-linked RGD-containing elastin-like polymer matrices.**

Sánchez-Ferrero A, Mata A, Alonso M, Rodríguez-Cabello JC, Planell J and Engel E. *24th European Conference On Biomaterials - Annual Conference of The European Society For Biomaterials*.

**Designing a multifunctional, thermoreversible hyaluronan-based hydrogel scaffold for tissue regeneration.**

Seelbach R, Peroglio M, Fransen P, Royo M, Mata A, Alini M and Eglin D. *24th European Conference On Biomaterials - Annual Conference of The European Society For Biomaterials*.

**Integrating top-down and self-assembly in the fabrication of peptide and protein-based biomedical materials.**

Smith KH, Tejeda-Montes E, Poch M and Mata A. *Chemical Society Reviews* vol. 40, (9) 4563-4577.

**Micro and nanotechnologies for bioengineering regenerative medicine scaffolds.**

Mata A. *International Journal of Biomedical Engineering and Technology* vol. 5, (2-3) 266-291.

**Toward multifaceted biomaterials that guide stem cell behaviour: Injectable, bioactive hyaluronan-based hydrogel scaffolds.**

Seelbach R, Peroglio M, Fransen P, Royo M, Mata A, Alini M and Eglin D. *European Cells and Materials* vol. 22, (SUPPL.4).

## 2010

### **Bone regeneration mediated by biomimetic mineralization of a nanofiber matrix.**

Mata A, Geng Y, Henrikson KJ, Aparicio C, Stock SR, Satcher RL and Stupp SI. *Biomaterials* vol. 31, (23) 6004-6012.

### **A self-assembly pathway to aligned monodomain gels.**

Zhang S, Greenfield MA, Mata A, Palmer LC, Bitton R, Mantei JR, Aparicio C, De La Cruz MO and Stupp SI. *Nature Materials* vol. 9, (7) 594-601.

### **Post microtextures accelerate cell proliferation and osteogenesis.**

Kim EJ, Boehm CA, Mata A, Fleischman AJ, Muschler GF and Roy S. *Acta Biomaterialia* vol. 6, (1) 160-169.

## 2009

### **A three-dimensional scaffold with precise micro-architecture and surface micro-textures.**

Mata A, Kim EJ, Boehm CA, Fleischman AJ, Muschler GF and Roy S. *Biomaterials* vol. 30, (27) 4610-4617.

### **Micropatterning of bioactive self-assembling gels.**

Mata A, Hsu L, Capito R, Aparicio C, Henrikson K and Stupp SI. *Soft Matter* vol. 5, (6) 1228-1236.

## 2008

### **Self-assembly of biomaterials at an interface: Formation of sacs, membranes, and strings.**

Capito RM, Azevedo HS, Velichko Y, Mata A and Stupp SI. *8th World Biomaterials Congress 2008* vol. 1,.

### **Peptide amphiphile microtextures for in vitro osteoblastic differentiation.**

Mata A, Hsu L, Capito R, Aparicio C and Stupp SI. *8th World Biomaterials Congress 2008* vol. 3,.

### **Peptide amphiphiles for bone regeneration.**

Mata A, Geng Y, Henrikson K, Sergeant T, Aparicio C, Satcher RL and Stupp SI. *8th World Biomaterials Congress 2008* vol. 3,.

### **Bioactive nanofibers instruct cells to proliferate and differentiate during enamel regeneration.**

Huang Z, Sargeant TD, Hulvat JF, Mata A, Bringas P, Koh CY, Stupp SI and Snead ML. *Journal of Bone and Mineral Research* vol. 23, (12) 1995-2006.

### **Self-assembly of large and small molecules into hierarchically ordered sacs and membranes.**

Capito RM, Azevedo HS, Velichko YS, Mata A and Stupp SI. *Science* vol. 319, (5871) 1812-1816.

### **Hybrid bone implants: Self-assembly of peptide amphiphile nanofibers within porous titanium.**

Sargeant TD, Guler MO, Oppenheimer SM, Mata A, Satcher RL, Dunand DC and Stupp SI. *Biomaterials* vol. 29, (2) 161-171.

## 2007

### **Connective tissue progenitor cell growth characteristics on textured substrates.**

Mata A, Boehm C, Fleischman AJ, Muschler GF and Roy S. *Int J Nanomedicine* vol. 2, (3) 389-406.

## 2006

### **Fabrication of multi-layer SU-8 microstructures.**

Mata A, Fleischman AJ and Roy S. *Journal of Micromechanics and Microengineering* vol. 16, (2) 276-284.

## 2005

### **Characterization of polydimethylsiloxane (PDMS) properties for biomedical micro/nanosystems.**

Mata A, Fleischman AJ and Roy S. *Biomedical Microdevices* vol. 7, (4) 281-293.

### **Fabrication of 3D micro-textured scaffolds for tissue engineering.**

Mata A, Fleischman AJ and Roy S. *Proceedings - Aspe Spring Topical Meeting On Precision Micro/Nano Scale Polymer Based Component and Device Fabrication, Aspe* 200 15-19.

**Expanding Frontiers in Biomaterials.**

Stupp SI, Donners JJM, Li L-S and Mata A. *Mrs Bulletin* vol. 30, (11) 864-873.

**Microfabricated 3D scaffolds for tissue engineering applications.**

Mata A, Fleischman AJ and Roy S. *Materials Research Society Symposium Proceedings* vol. 845, 97-103.

**2003**

**Osteoblast attachment to a textured surface in the absence of exogenous adhesion proteins.**

Mata A, Su X, Fleischman AJ, Roy S, Banks BA, Miller SK and Midura RJ. *Ieee Trans Nanobioscience* vol. 2, (4) 287-294.

**2002**

**Growth of connective tissue progenitor cells on microtextured polydimethylsiloxane surfaces.**

Mata A, Boehm C, Fleischman AJ, Muschler G and Roy S. *Journal of Biomedical Materials Research* vol. 62, (4) 499-506.

**Analysis of connective tissue progenitor cell behavior on polydimethylsiloxane smooth and channel micro-textures.**

Mata A, Boehm C, Fleischman AJ, Muschler G and Roy S. *Biomedical Microdevices* vol. 4, (4) 267-275.