

İleri Hücre Biyolojisi

56902001

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Doku Mühendisliği

Doğal ECM bileşimi in-vitro şartlarda taklit edilebilir mi?

M. Parmaksiz

Doku Mühendisliği

DESELÜLERİZASYON TEKNOLOJİSİ



Hücreleştirme teknolojinin temel prensibi, çeşitli kaynaklardan elde edilen doku veya organların uygun yöntemler ile hücrelerinden arındırılmasına ve bu yolla biyoyumlu doğal üç-boyutlu yapıya sahip biyoiskelelerin elde edilmesine dayanmaktadır.

Journal of Cellular Biochemistry 99, 74-82 (2005)

Small Intestinal Submucosa as a Large Diameter Vascular Graft in the Dog

Elizabeth F. Bost-Lax, PhD, PhD, MS, MEd, Gary C. Lavin, DVM, DABVP, American College of Veterinary Pathologists, University of Georgia, GA, USA

Michael S. Bost, PhD, PhD, MS, MEd, Gary C. Lavin, DVM, DABVP, American College of Veterinary Pathologists, University of Georgia, GA, USA

Published online 16 June 2005

Dokulardan elde edilecek ECM'nin doğal üç-boyutlu yapısı ve çok yönlü aktif bileşiminin önemli ölçüde korunabilmesi sayesinde in-vitro şartlarda doğal ECM üretimi potansiyeli yüksektir.

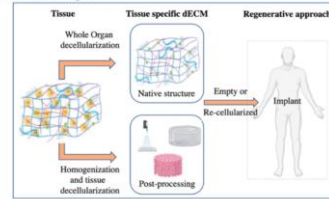
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DESELÜLERİZASYON TEKNOLOJİSİ

Tissue-Specific Decellularization Methods: Rationale and Strategies to Achieve Regenerative Compounds

Ural Mondilil^{1,2}, Raquel Ruiz-Hernandez^{1,2,3}, Angel Regal-Castano^{1,2,3}, Norma Garcia-Lopez^{1,2}, Beatriz Villeda-Cuevas^{1,2} and Andor Akarsoy^{1,2,3,4}



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DESELÜLERİZASYON TEKNOLOJİSİ

Optimal doku işleyişini sağlamada etkin roller üstlenen kollajen tüpleri, glikozaminoglikanlar ile, döndürücü büyüme faktörü- β (TGF- β), bazik fibroblast büyüme faktörü (b-FGF), vasküler endotelial büyüme faktörü (VEGF) gibi çeşitli büyüme faktörlerinin doğal yapılarında aktif durumda korunabildiği gösterilmiştir.

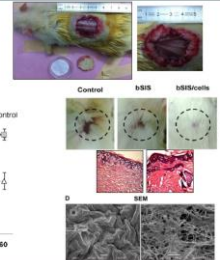
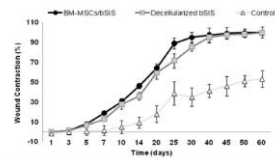


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Doku Mühendisliği

DESELÜLERİZASYON TEKNOLOJİSİ

Decellularization of bovine small intestinal submucosa and its use for the healing of a critical-sized full-thickness skin defect, alone and in combination with stem cells, in a small rodent model



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Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

TÜRK PATENT ENSTİTÜSÜ

Decellularization of Bovine Small Intestinal Submucosa and Its Use for the Healing of a Critical-sized Full-thickness Skin Defect, Alone and in Combination with Stem Cells, in a Small Rodent Model

Decellularized SIS-ECM as a Regenerative Biomaterial for Skin Wound Repair
Mehmet Parmakçı, Ayşe Esen Eğin, and Yasar Murat Eğin

M. Parmakçı

Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

Decellularization of Bovine Small Intestinal Submucosa
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Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

Hücre Kültürü Temelli Çalışmalar

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Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

Magnesium-oxidative decellularized bovine matrix with or without low frequency-pulsed electrostatic field exposure for the healing of a critical-size bone defect
Mehmet Parmakçı, Ayşe Esen Eğin, Yasar Murat Eğin, Ayşe Esen Eğin, Yasar Murat Eğin, Yasar Murat Eğin

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Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

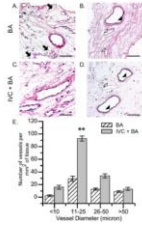
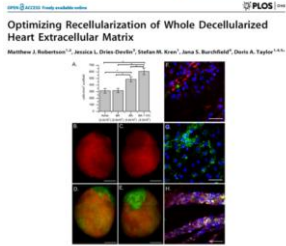
Bilateral Critical-Size Rat Cranial Defect Model

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Doku Mühendisliği **DESELÜLERİZASYON TEKNOLOJİSİ**

Preparation and characterization of human size whole heart for organ engineering: scaffold microangiographic imaging
Ayşe Esen Eğin, Mehmet Parmakçı, Yasar Murat Eğin, Ayşe Esen Eğin, Yasar Murat Eğin, Yasar Murat Eğin

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Biomedical Materials

Topical Review
Clinical applications of decellularized extracellular matrices for tissue engineering and regenerative medicine
Mehmet Parmakçiz¹, Arzu Doğan², Seda Özkan³, A. Evren Elçi⁴ and T. Murat Dığın^{1,2}

- I. Ortopedik ve dental uygulamalar**
Tendon, ligament, bone, muscle, oral, maxillofacial etc.
- II. Plastik ve rekonstrüktif cerrahi uygulamalar**
Skin, Hernia, Pelvis, Breast tissue etc.
- III. Kardiyovasküler uygulamalar**
Hearh valve, cardiac patches etc.

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- I. Ortopedik ve dental uygulamalar**
Tendon, ligament, bone, muscle, oral, maxillofacial etc.

Kemik, kıkırdak ve tendon/ligament dokularında mekanik hasarlar, enfeksiyonlar veya tümör rezeksiyonları nedeniyle oluşan doku kaybının onarımında kullanılmaktadır.

Decellularized and Acellular biomaterials in orthopedic and dental surgery.	
Product/Company	Source
AlloDerm® (LifeCell corp., USA)	Human Dermis
Conexa™ (Tornier, Inc., The Netherlands)	Porcine Dermis
TissueMend® (Stryker Orthopaedics, USA)	Fetal Bovine Dermis
CuffPatch™ (Organogenesis, USA)	Porcine SIS
Cancello-Pure® (Wright Medical, USA)	Bovine bone

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Table 1. Clinical use of decellularized and acellular biomaterials in orthopedic and dental surgery.

Product/company	Tissue/ECM source	Applications
GraftJacket® (Wright Medical Inc., USA)	Human dermis	Augmentation of massive rotator cuff tears, arthroscopic rotator cuff and achilles tendon repairs, lateral ankle stabilization, and posterior tibial tendon reconstruction
Puro® DBM (Zimmer, RTI Biologics, Inc., USA)	Human cortical cancellous DBM	Dental intranasous, oral & maxillofacial defects, sinus lifting, intranasous, pelvic and spine defect repair, interbody, and posterolateral spine fusion procedures
BioSeal™ (Regeneration Technologies, USA)	Human DBM/natural gelatin	Ossous gaps and bone defects
Grafton® (BioFortisum IPFL Inc., USA)	Allograft DBM	Ridge, sinus and bone augmentation, bone defects, periodontal regeneration
DRX® (MTT/Synthes Inc., USA)	Human DBM/sodium hyaluronate	Periodontal & endo-dental augmentation, maxilla & mandibula fractures, mandibular reconstruction, oral/maxillofacial and dental intranasous defects, osseous defects in the cranium
Acell Collagen® & TBM® (Integra Lifesciences Corp., USA)	Human DBM and total bone matrix	Bone graft extender in the spine, cranium and pelvis, voids or gaps defects or the result of traumatic injury to the bone

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- I. Plastik ve rekonstrüktif cerrahi uygulamalar**
Skin, Hernia, Pelvis, Breast tissue etc.

Decellularized and Acellular biomaterials in Plastic and reconstructive surgical applications	
Product/Company	Source
AlloDerm® (LifeCell corp., USA)	Human Dermis
MatrisStem® (Acell Inc., USA)	Porcine UBM
Oasis® (Cook Biotech Inc., USA)	Porcine SIS
Endoform™ (Aroa Biosurgery, New Zealand)	Ovine forestomach submucosa
Ventlas® (Synovis Surgical Innovations, USA)	Bovine pericardium

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Table 2. Clinical application of decellularized and acellular biomaterials in plastic and reconstructive surgery.

Product/company	Tissue/ECM source	Applications
AlloDerm® (LifeCell Corp., USA)	Human dermis	Wound, hernia, pelvic and breast reconstruction
FlexiHP® (Ethicon/Johanson & Johnson, USA)	Human dermis	Wound, hernia and breast reconstruction
Tutopatch® (RTI Surgical, Inc., USA)	Bovine pericardium	Diaphragm, oral-maxillofacial surgery, hernia and pelvic repair
Vertas® (Synovis Surgical Innovations, USA)	Bovine pericardium	Pelvic floor, pelvic/rectal prolapse, and hernia repair
Axi® (Coleplast Corp., USA)	Human dermis	Pelvic floor repair and urethral sling implantation
Repliflex® (Boston Scientific, USA)	Human dermis	Enteroctes, rectoctes, cystoctes and pelvic floor repair
EpiFlex® (Hannover Medical School, Germany)	Human dermis	Burns/wars treatment and breast reconstruction
DermaMatrix® (synthes CME, USA)	Human dermis	Replacement, repair or reinforcement of soft tissues

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I. Kardiyovasküler uygulamalar

Heart valve, cardiac patches etc..

Table 3. Clinical use of decellularized and acellular biomaterials in cardiovascular applications.

Product/company	Tissue/ECM source	Applications
Phospho™ / CryoLife Inc., USA	Bovine pericardium	It can be used in atrial and ventricle repair, great vessel repair, congenital defects and pericardial closure
CryoValve® SG Pulmonary Heart Valve / CryoLife Inc., USA	Human pulmonary valve	Valve replacement during flow, congenital reconstruction, repair of the right ventricular outflow tract, pediatric pulmonary valve replacement
CryoValve® Aortic Valve / CryoLife Inc., USA	Human aortic valves	Aortic valve endocarditis, valve replacement, small aortic root requiring aortic valve replacement
CorMatrix® ECM, USA	Porcine SIS	Coronary repair, pericardial repair and reconstruction, cardiac tissue repair
SIM™ Pericardial Patch / St. Jude Medical, USA	Bovine pericardium	Annular reconstruction, endocarditis, leaflet and septal defect repairs, aortic root enlargement, and other vascular repairs
TuboPatch® / Med & Care, Poland	Bovine pericardium	Pericardial and thoracic wall replacement, suture buttress in pulmonary resections and esophageal tumors, retro-peritoneum closure