Journal of Biomechanics

Affiliated with the American Society of Biomechanics, the International Society of Biomechanics, the European Society of Biomechanics, the Japanese Society for Clinical Biomechanics and the Australian and New Zealand Society of Biomechanics.

Volume 43 Issue 1 **5 January 2010**

Contents

Special Issue on Cell Mechanobiology

Editorial

W.D. Merryman and A.J. Engler 1 **Innovations in *Cell Mechanobiology***

Special Issue Papers

K.N. Dahl, E.A. Booth-Gauthier and B. Ladoux 2 **In the middle of it all: Mutual mechanical regulation between the nucleus and the cytoskeleton**

J. Stricker, T. Falzone and M.L. Gardel 9 **Mechanics of the F-actin cytoskeleton**

Z. Qin, M.J. Buehler and L. Kreplak 15 **A multi-scale approach to understand the mechanobiology of intermediate filaments**

T. Hawkins, M. Mirigian, M. Selcuk Yasar and J.L. Ross 23 **Mechanics of microtubules**

P.E. Constantinou and M.R. Diehl 31 **The mechanochemistry of integrated motor protein complexes**

E.L. Baker and M.H. Zaman 38 **The biomechanical integrin**

S. Sen and S. Kumar 45 **Combining mechanical and optical approaches to dissect cellular mechanobiology**

G.C. Reilly and A.J. Engler 55 **Intrinsic extracellular matrix properties regulate stem cell differentiation**

L.A. Davidson, S.D. Joshi, H.Y. Kim, M. von Dassow, L. Zhang and J. Zhou 63 **Emergent morphogenesis: Elastic mechanics of a self-deforming tissue**

M.C. LaPlaca and G.R. Prado 71 **Neural mechanobiology and neuronal vulnerability to traumatic loading**

J.P. Califano and C.A. Reinhart-King 79 **Exogenous and endogenous force regulation of endothelial cell behavior**

W.D. Merryman 87 **Mechano-potential etiologies of aortic valve disease**

J.G. Jacot, J.C. Martin and D.L. Hunt 93 **Mechanobiology of cardiomyocyte development**

D.J. Tschumperlin, F. Boudreault and F. Liu 99 **Recent advances and new opportunities in lung mechanobiology**

J.-H. Chen, C. Liu, L. You and C.A. Simmons 108 **Boning up on Wolff's Law: Mechanical regulation of the cells that make and maintain bone**

S.D. McCullen, C.M. Haslauer and E.G. Loboa 119 **Musculoskeletal mechanobiology: Interpretation by external force and engineered substratum**

A.H. Huang, M.J. Farrell and R.L. Mauck 128 **Mechanics and mechanobiology of mesenchymal stem cell-based engineered cartilage**

A.H. Hsieh and J.D. Twomey 137 **Cellular mechanobiology of the intervertebral disc: New directions and approaches**

Continued on inside back cover

Available online at

ScienceDirect

www.sciencedirect.com

ELSEVIER

0021-9290(20100105)43:1;1-Q

Journal of Biomechanics

Affiliated with the American Society of Biomechanics, the International Society of Biomechanics, the European Society of Biomechanics, the Japanese Society for Clinical Biomechanics and the Australian and New Zealand Society of Biomechanics.

Volume 43 Issue 1 **5 January 2010**

Continued from outside back cover

B. Hinz	146	**The myofibroblast: Paradigm for a mechanically active cell**
G.M. Williams, E.F. Chan, M.M. Temple-Wong, W.C. Bae, K. Masuda, W.D. Bugbee and R.L. Sah	156	**Shape, loading, and motion in the bioengineering design, fabrication, and testing of personalized synovial joints**
F. Baaijens, C. Bouten and N. Driessen	166	**Modeling collagen remodeling**

Abstracted/indexed in: *Appl. Mech. Rev., Res. Alert, Biosis Data., Bioeng. Abstr., Cam. Sci. Abstr., Curr. Cont./Life Sci., EMBASEExcerpta Medica; Elsevier BIOBASE Current Awareness in Biological Sciences, COMPENDEX, Engin. Indx Ann., Ei Engin. Mtg, Eng. Ind., Ergon. Abstr., Excerp. Med., INSPEC Data., Curr. Cont. ISI/BIOMED Database, MEDLINE, Mechanics, Oper. Res. Manage. Sci., PASCAL-CNRS Data., Curr. Cont. Sci. Cit. Ind., Curr. Cont. SCISEARCH Data., Ind. Med., Review. Also covered in the abstract and citation database SCOPUS®. Full text available on ScienceDirect®.*

ISSN 0021-9290