

应用生物力学

YIYONG SHENGWU LIXUE

双月刊 1986年6月创刊 第37卷 第2期 2022年4月出版



[期刊基本参数] CN 31-1624/R * 1986 * b * A4 * 188 * zh+en * P * ¥25.00 * 2000 * 30 * 2022-04

主管
中华人民共和国教育部
主办
上海交通大学
承办
上海交通大学医学院附属
第九人民医院
出版
《医用生物力学》编辑部
编辑部
地址 上海市制造局路 639 号
邮编 200011
电话 (021) 53315397
传真 (021) 63137020
电子邮件
shengwulixue@163.com

网址
http://www.medbiomechanics.com
http://www.mechanobiology.cn
微博
http://weibo.com/u/2040064195

广告部 水汶

名誉主编

戴尅戎

主编

姜宗来

常务副主编

赵杰

副主编

陈维毅 樊瑜波 齐颖新

秦岭 郑诚功

编辑部主任

于志锋

E-mail: zfyu@outlook.com

责任编辑

徐绮

E-mail: 1534340082@qq.com

英文编辑

徐绮

编辑

《医用生物力学》编辑委员会

印刷

山西万方知网印刷有限公司

国内发行

上海市报刊发行局

国外总发行

中国国际图书贸易总公司

订购

全国各地邮局

邮发代号 4-633

定价 每期:25.00元 全年 150.00元

国内统一连续出版物号

CN 31-1624/R

国际标准连续出版物号

ISSN 1004-7220

CODEN YSLIBU

©2022 年版权归《医用生物力学》

编辑部所有

目次

述评

- 植介入生物材料的结构、力学特性与生物效应 (197)
樊瑜波

专家论坛

- 力学环境调控骨基质仿生矿化 (200)
马春阳, 杜田明, 牛旭锋, 樊瑜波
材料生物力学 2021 年研究进展 (211)
陈振银, 吕永钢

论著

- 灌流载荷作用下软骨支架降解仿真研究 (219)
魏莹, 谭沿松, 高丽兰, 李瑞欣, 张春秋
保存时间对兔髌韧带压缩力学性能的影响 (225)
刘力夫, 尹梦虹, 齐志明, 王鹏, 吴承伟, 张伟
离体猪气管异向力学特性及数值模拟研究 (231)
魏雯, 司利钢, 王亚君, 鲍玉冬, 齐东博
冲击载荷下脂肪层的压缩性能 (238)
刘荣华, 温垚珂, 闫文敏, 鲍振宇, 董方栋, 周俊羽
空心钉与锁定钢板治疗股骨颈骨折的振动特性 (244)
章浩伟, 徐昕晟, 刘颖, 吴升辉, 梅炯
骨盆微创内固定生物力学分析与优化 (250)
吴明晖, 包钊华, 王建东, 毕春, 邓国英
下胫腓联合新型微动弹性植入物背伸位力学分析 (256)
梁成, 李春艳, 张瀚文, 薛建强, 段可, 王冠, 鲁晓波
飞行员机动飞行过程中颈椎动力学响应仿真及损伤预测
..... (262)
王家涛, 包佳仪, 周前祥, 郭攀, 张景飞
半蹲式跳伞胫腓骨及踝关节骨折损伤分型及骨折区段分析
..... (268)
罗陈宇, 田山, 江天云, 柳松杨, 张浩, 张家康, 王丽珍,
樊瑜波
附件磨损对牙齿移动影响的有限元分析 (274)
李文龙, 毕绍洋, 郭子源, 石广玉, 张锡忠

不同稳定咬合板厚度对可复性前移位患者颞下颌关节应力分布影响	(280)
鄢梨,王为,邱嘉旋	
可折叠微板测量单细胞三维状态下的牵张力	(287)
赵丽君,王晨艳,张全有,黄棣,侯晋川,陈维毅	
放疗中肿瘤生长数学模型及放射敏感性分析	(292)
张萌,赵改平,夏费一,许海飞,俞晓立	
10周北欧腓绳肌运动对膝关节离心控制屈曲角度和离心肌力的影响	(299)
王文锦,朱仁坤,马冉冉,田斐,朱婷,赵雅琦,李霖欣,王少白	
下肢外骨骼人机耦合交互力特性分析	(305)
周泽世,朱钧,朱云超,张鑫彬,陈文明,马昕	
老年人坐立转换时股骨近端应力分布的有限元分析	(312)
王攀,霍洪峰	
正常国人盂肱关节在不同手臂抬高平面的运动学研究	(317)
袁施挺,竺思远,谷雪莲,王少白,王建华	
1例Stanford B型主动脉夹层TEVAR术后新发破口的血流动力学分析	(323)
李矜燕,李达,樊瑜波,袁丁,王家嵘,张颖慈,郑庭辉	
一种模拟血液循环系统实验研究	(329)
赵怡铭,李军,许剑	
生理性周期性张应变通过激活AMPK磷酸化抑制血管平滑肌细胞迁移	(335)
范洋晶,李之音,姜宗来,齐颖新,韩悦	
基于Matlab无创正压通气下呼吸道气阻与顺应性的在线测算方法研究	(342)
袁越阳,胡兴硕,罗鑫,周理,马小林,刘炜,戴征	
四点跪位和手足位训练中躯干肌肉激活和共收缩模式比较	(348)
常晓倩,王宽,陈新鹏,王乐军,牛文鑫	
膝骨关节炎患者本体感觉特征	(355)
石静楠,薛雅月,张宽,张昊华,闫松华	
护踝类型对落地时下肢运动学的影响:Meta分析和系统评价	(361)
张泽毅,李文彦,范婷,刘卉,张美珍,武晓刚,陈维毅	

综 述

外泌体在力相关牙周炎症反应中的作用	(369)
张轶凡,胥春	
细胞因子介导的骨骼肌系统与免疫系统间调控网络	(374)
张子涵,杨欢,黄庆生,杨慧	
鼓膜穿孔与鼓膜修补材料的有限元分析及临床研究进展	(379)
张楠,刘璟,别旭	

《医用生物力学》杂志由中华人民共和国教育部主管、上海交通大学主办,所发表之图文、版权(含翻译权)均归《医用生物力学》编辑部(出版人)所有。未经出版人书面许可,不得对本刊内容进行任何目的和形式的转载、转播及复制,包括转换成用于资料信息处理设施的机械、电子语言。

本刊实行通讯作者负责制,每篇论文均由2~3位同行评委(peer reviewer)独立审稿。发表的图文中所表达的任何内容与观点,均属作者个人的见解与意见,并不反映和代表《医用生物力学》编辑部的立场和观点。有关所发表文章的任何问题,均由作者负责解释,出版人不承担任何与之相关的责任。

本刊是中国科技核心期刊,已被北京大学图书馆《中文核心期刊要目总览》、《中国科学引文数据库》、荷兰《文摘与引文数据库》等国内外多家知名数据库收录。

本杂志采用无酸纸(acid-free)印刷。

Supervised by

Ministry of Education of
People's Republic of China

Sponsored by

Shanghai Jiao Tong University

Organized by

Shanghai Ninth People's Hospital,
Shanghai Jiao Tong University
School of Medicine

Published by

Editorial Office of
Journal of Medical Biomechanics

Editorial Office

No. 639 Zhizaoju Rd.,
Shanghai 200011, China
Tel: + 86 21 53315397
Fax: + 86 21 63137020

E-mail: shengwulixue@163.com

Website:

<http://www.medbiomechanics.com>

<http://www.mechanobiology.cn>

Microblog:

<http://weibo.com/u/2040064195>

Advertising division: SHUI Wen

Honorary Editor-in-Chief

DAI Kerong

Editor-in-Chief

JIANG Zonglai

Executive Vice Editor-in-Chief

ZHAO Jie

Associate Editors-in-Chief

CHEN Weiji CHENG Chengkung
FAN Yubo QI Yingxin QIN Ling

Editorial Director

YU Zhifeng

E-mail: zfyu@outlook.com

Executive Editor

XU Qi

E-mail: 1534340082@qq.com

English Editor

XU Qi

Edited by

Editorial Board of

Journal of Medical Biomechanics

Printed by

Shanxi Tongfang Knowledge Network
Printing Co., Ltd.

Overseas Distributor

China International Book
Trading Cooperation

China Standard Serial Numbering

ISSN 1004-7220

CN 31-1624/R

CODEN YSLIBU

Subscription

Yearly Subscription Rates: 150.00 RMB

Single Issue: 25.00 RMB

Copyright © 2022 by the Editorial

Board of *Journal of Medical Biomechanics*

Contents

Invited Review

- Structure, Mechanical Properties and Biological Effects of Implant
Biomaterials (197)
FAN Yubo

Expert Forum

- Biomechanical Environment Regulates Biomimetic Mineralization of Bone
Matrix (200)
MA Chunyang, DU Tianming, NIU Xufeng, FAN Yubo
- Progress in Biomechanics of Materials in 2021 (211)
CHEN Zhenyin, LÜ Yonggang

Original Articles

- Numerical Analysis on Degradation of Cartilage Scaffold under Perfusion
Loading (219)
WEI Ying, TAN Yansong, GAO Lilan, LI Ruixin, ZHANG Chunqiu
- Effects of Storage Duration on Compressive Mechanical Properties of
Rabbit Patellar Ligament (225)
*LIU Lifu, YIN Menghong, QI Zhiming, WANG Peng, WU Chengwei,
ZHANG Wei*
- Study on Anisotropy Properties of *in vitro* Pig Trachea and Numerical
Simulation (231)
WEI Wen, SI Ligang, WANG Yajun, BAO Yudong, QI Dongbo
- Compression Properties of Fat Layer under Impact Loading (238)
*LIU Ronghua, WEN Yaoke, YAN Wenmin, BAO Zhenyu, DONG Fangdong,
ZHOU Junyu*
- Vibration Characteristics of Hollow Screws and Locking Plates for Treating
Femoral Neck Fractures (244)
ZHANG Haowei, XU Xinsheng, LIU Ying, WU Shenghui, MEI Jiong
- Biomechanical Analysis and Optimization of Minimally Invasive Pelvic
Internal Fixation (250)
WU Minghui, BAO Zhaohua, WANG Jiandong, BI Chun, DENG Guoying
- Mechanics Analysis on Novel Micro-Movement Elastic Implant of Distal
Tibiofibular Syndesmosis in Dorsiflexion Position (256)
*LIANG Cheng, LI Chunyan, ZHANG Hanwen, XUE Jianqiang, DUAN Ke,
WANG Guan, LU Xiaobo*
- Dynamic Response Simulation and Damage Prediction of Pilot Cervical
Vertebra During Maneuver Flight (262)
WANG Jiatao, BAO Jiayi, ZHOU Qianxiang, GUO Pan, ZHANG Jingfei
- Fracture Classification and Injury Segment Analysis of Tibiofibula and
Ankle in Half-Squat Parachuting Landing (268)
*LUO Chenyu, TIAN Shan, JIANG Tianyun, LIU Songyang, ZHANG Hao,
ZHANG Jiakang, WANG Lizhen, FAN Yubo*
- Effects of Attachment Wear on Tooth Movement: A Finite Element
Analysis (274)
LI Wenlong, BI Shaoyang, GUO Ziyuan, SHI Guangyu, ZHANG Xizhong
- Effects of Different Stabilization Splint Thicknesses on Stress Distribution
in Temporomandibular Joint for Patients with Anterior Disc Displacement
with Reduction (279)
YAN Li, WANG Wei, QIU Jiaxuan

Single Cell Traction Force Measured by Foldable Microplates	(287)
<i>ZHAO Lijun, WANG Chenyan, ZHANG Quanyou, HUANG Di, HOU Jinchuan, CHEN Weiyi</i>	
Mathematical Model of Tumor Growth in Radiotherapy and Radiosensitivity Analysis	(292)
<i>ZHANG Meng, ZHAO Gaiping, XIA Feiyi, XU Haipei, YU Xiaoli</i>	
Effects of 10-Week Nordic Hamstring Training on Knee Eccentric Control Angle and Muscle Strength	(299)
<i>WANG Wenjin, ZHU Renkun, MA Ranran, TIAN Fei, ZHU Ting, ZHAO Yaqi, LI Jixin, WANG Shaobai</i>	
Characteristic Analysis on Human-Machine Interaction Force of Lower Limb Exoskeleton	(305)
<i>ZHOU Zeshi, ZHU Jun, ZHU Yunchao, ZHANG Xinbin, CHEN Wenming, MA Xin</i>	
Finite Element Analysis on Stress Distributions of Proximal Femur in the Elderly During Sit-to-Stand Transition	(312)
<i>WANG Pan, HUO Hongfeng</i>	
Kinematics Study of Glenohumeral Joint at Different Arm Elevation Planes in Normal Chinese	(317)
<i>YUAN Shiting, ZHU Siyuan, GU Xuelian, WANG Shaobai, WANG Jianhua</i>	
Hemodynamic Analysis of Redissection after Endovascular Repair for One Stanford Type B Aortic Dissection Case	(323)
<i>LI lingyan, LI Da, FAN Yubo, YUAN Ding, WANG Jiarong, ZHANG Yingci, ZHENG Tinghui</i>	
Simulation Experimental Study on Mock Circulation System	(329)
<i>ZHAO Yiming, LI Jun, XU Jian</i>	
Physiological Cyclic Stretch Inhibits Vascular Smooth Muscle Cell Migration via Activating AMPK Phosphorylation	(335)
<i>FAN Yangjing, LI Zhiyin, JIANG Zonglai, QI Yingxin, HAN Yue</i>	
Matlab-Based Study on Online Monitoring of Respiratory Resistance and Compliance under Noninvasive Positive Airway Pressure Ventilation	(342)
<i>YUAN Yueyang, HU Xingshuo, LUO Xing, ZHOU Li, MA Xiaolin, LIU Wei, DAI Zheng</i>	
Comparison of Muscle Activation and Co-Contraction Patterns for Trunk Muscles During Four-Point Hand-Knee and Hand-Foot Kneeling Positions	(348)
<i>CHANG Xiaolian, WANG Kuan, CHEN Xinpeng, WANG Lejun, NIU Wenxin</i>	
Characteristics of Proprioception in Patients with Knee Osteoarthritis	(355)
<i>SHI Jingnan, XUE Yayue, ZHANG Kuan, ZHANG Haohua, YAN Songhua</i>	
The Effect of Ankle Brace on Biomechanics of the Lower Extremity During Landing: A Systematic Review and Meta Analysis	(361)
<i>ZHANG Zeyi, LI Wenyan, FAN Ting, LIU Hui, ZHANG Meizhen, WU Xiaogang, CHEN Weiyi</i>	

Review Articles

The Role of Exosomes in Force-Related Periodontal Inflammatory Response	(369)
<i>ZHANG Yifan, XU Chun</i>	
Cytokine-Mediated Regulatory Networks Between Skeletal Muscle System and Immune System	(374)
<i>ZHANG Zihan, YANG Huan, HUANG Qingsheng, YANG Hui</i>	
Finite Element Analysis and Clinical Research Progress of Tympanic Membrane Perforation and Tympanic Membrane Repair Materials	(379)
<i>ZHANG Nan, LIU Jing, BIE Xu</i>	

The *Journal of Medical Biomechanics* (JMB) is sponsored by Shanghai Jiao Tong University and supervised by Ministry of Education of People's Republic of China. The copyright is reserved by Editorial Office of *Journal of Medical Biomechanics*. No contents are allowed to be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the written permission from the publisher.

All manuscripts are reviewed by two or three independent expert reviewers. The information presented in the papers and the opinions expressed therein are those of the individual authors and not necessarily reflect the views of the Editorial Board of *Journal of Medical Biomechanics*. The publisher assumes no liability for any materials published in the journal. All statements are the responsibilities of the authors, particularly the corresponding author (s).

JMB is the source journal for Chinese Scientific and Technical Papers and Citations, and is selected in the *Guide to the Core Journals of China* by Peking University Library. It has been included in certain famous databases such as China Science Citation Database (CSCD) and Scopus.

This journal is printed on acid-free papers.