# 居用生物力学

YIYONG

**SHENGWU** 

LIXUF

双月刊 1986年6月创刊 第35卷 第 5 期 2020 年 10 月出版



「期刊基本参数」 CN 31-1624/R \* 1986 \* b \* A4 \* 128 \* zh+en \* P \* ¥ 25.00 \* 2000 \* 19 \* 2020-10

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 批出 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 http://weibo.com/u/2040064195 广告部 水 汶 主 编 戴討戎 常务副主编 姜宗来 副主编 陈维毅 樊瑜波 龙 勉 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 吴晓芸 编 辑 《医用生物力学》编辑委员会 山西同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 全国各地邮局 邮发代号 4-633 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

编辑部所有

©2020 年版权归《医用生物力学》

# 次

论	<b>当</b>	
	涂层修饰的柔性神经电极力学综合性能评估	(389)
	谢颉,张文光,李伟,周旭晖	
	钻头刃型结构和钻削参数对骨骼钻削过程的影响	(396)
	程肖,程正,杜兴泽,杜茂华	
	新型组合式锁定钢板治疗 Sanders Ⅱ 型及 Ⅲ 型跟骨骨折的	
	有限元分析	(401)
	郭万恺,崔崟,李昊伟,王秀会	
	内侧副韧带修补与冠状突骨折固定对恐怖三联征肘关节	
	稳定性的影响	(408)
	范鑫斌,宋超,丁志宏,吴亮,周文超,冯刚,刘粤,	
	孔德策,杨铁毅,张岩	
	砍击案件中刀器锋利程度对前臂损伤的影响	(414)
	郝卫亚,山松俊杰,石屹,杨超鹏,吴成亮,何卫,	
	辛振芳,王坚,王明直	
	低密度脂蛋白在颈动脉中输运与沉积的数值模拟及其	
	影响因素	(421)
	周鑫栋,梁夫友	
	基于冠状动脉形状阻力的血流储备分数数值模拟	(430)
	张宏辉,乔爱科	
	一种体外贴壁细胞应变加载装置的研制	(436)
	崔路,王鑫,高丽兰,张春秋,张西正	
	微创电动吻合器的优化设计、功能分析与离体实验	(442)
	葛文明,王佩瑶,刘晨旭,凌宇秀,潘贞,胡钟欣,周宇,	
	宋成利	

	数值分析力矩比对尖牙平移移动的影响	(449)
	蔡永清	
	基于躯干细化模型腰椎间盘突出症患者与健康人群在3种日常活动下的运动学差异	(455)
	徐明鑫,朱紫薇,蒯声政,廖振华,刘伟强	
	兔单椎轴向动态冲击的实验研究	(463)
	杜一铭,张绪树,郭媛,徐凡丁,盛文倩	
	不同手术方法治疗老年股骨粗隆间骨折效果及其生物力学研究	(470)
	张全,曾勇,舒鑫	
	自主研制胸锁关节解剖锁定钢板的生物力学对比	(476)
	周举,杨琨,孙远林,向飞帆,刘煊文,阳运康	
	基于表面肌电分析老年人负重跨障行走跌倒风险	(483)
	王新亭,伊国富,张峻霞,苏海龙,任建平,邱念	
	应用动态双平面成像技术研究在体肘关节主动屈伸运动特征	(490)
	邹第洋,胡项俊,胡海,龚伟华,蔡宗远	
综	述	
	肺高压相关肺循环血流动力学计算模拟研究进展	(497)
	王丽平,张明杰,刘金龙,徐卓明	
	力学调控长链非编码 RNA 对间充质干细胞成骨分化作用的研究进展	(504)
	程威,林祥龙,张扬,刘洋,朱双龙,刘迎节,李瑞欣,徐云强,张西正	
	腰椎旋转中心的研究进展及联合评估	(511)

《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。

朱紫薇,廖振华,刘伟强

## JOURNAL OF MEDICAL BIOMECHANICS

**Published Bimonthly** 

Founded in June, 1986

Volume 35 Number 5, Oct. 2020

Journal Basic Information CN 31-1624/R \* 1986 \* b \* A4 \* 128 \* zh+en \* P \* ¥25,00 \* 2000 \* 19 \* 2020-10

[ Journal Basic Information ] CN 31-162	4/R*
Supervised by	$C_{i}$
Ministry of Education of	
People's Republic of China	
Sponsored by	Ori
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	
Editor-in-Chief	
DAI Kerong	
Executive Vice Editor-in-Chief	
JIANG Zonglai	
Associate Editors-in-Chief	
CHEN Weiyi CHENG Chengkung	
FAN Yubo LONG Mian	
QIN Ling	
Editorial Director	
YU Zhifeng	
E-mail: zfyu@ outlook.com	
Executive Editor	
XU Qi	
E-mail: 1534340082@ qq.com	
English Editor	
WU Xiaoyun	
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 © 2020 by the Editorial	
Copyright @ 2020 by the Eultonal	1

Board of Journal of Medical Biomechanics

#### **Contents**

### **Original Articles**

CAI Yongqing

ginal Articles		
Evaluation on Mechanical Comprehensive Performance of Flexible		
Neural Electrodes Modified by Coatings	(389)	
XIE Jie, ZHANG Wenguang, LI Wei, ZHOU Xuhui		
The Influence of Drill Bit Structure and Drilling Parameters on		
Bone Drilling Process	(396)	
CHENG Xiao , CHENG Zheng , DU Xingze , DU Maohua		
Finite Element Analysis on Sanders II and III Calcaneal Fractures		
Treated with the Novel Composite Locking Plate	(401)	
GUO Wankai, CUI Yin, LIU Haowei, WANG Xiuhui		
Effects on Elbow Stability of the Terrible Triad Using Medial		
Collateral Ligament Repair and Ulnar Coronoid Process Fixation	(408)	
FAN Xinbin, SONG Chao, DING Zhihong, WU Liang, ZHOU Wenchao	ο,	
FENG Gang, LIU Yue, KONG Dece, YANG Tieyi, ZHANG Yan		
The Influence of Knife Sharpness on Forearm Wounds in Knife		
Slash Cases	(414)	
HAO Weiya, SHAN Sonjunjie, SHI yi, YANG Chaopeng, WU Chengliang,		
HE Wei, XIN Zhenfang, WANG Jian, WANG Mingzhi		
Numerical Study on Low-Density Lipoprotein Transport and Deposit	tion	
in Carotid Arteries and the Associated Factors	(421)	
ZHOU Xindong, LIANG Fuyou		
Numerical Simulation of Fractional Flow Reserve Based on Shape		
Resistance of Coronary Artery	(430)	
ZHANG Honghui, QIAO Aike		
Development of Strain Loading Device for Adherent Cells in vitro	(436)	
CUI Lu , WANG Xin , GAO Lilan , ZHANG Chunqiu , ZHANG Xizheng		
Design Optimization, Function Analysis and in vitro Experiments of		
Design Optimization, Function Analysis and in vitro Experiments of	f	
Design Optimization, Function Analysis and <i>in vitro</i> Experiments of an Electric Stapler for Minimally Invasive Surgery	f (442)	
an Electric Stapler for Minimally Invasive Surgery		
an Electric Stapler for Minimally Invasive Surgery  GE Wenming, WANG Peiyao, LIU Chenxu, LING Yuxiu, PAN Zhen,		
an Electric Stapler for Minimally Invasive Surgery  GE Wenming, WANG Peiyao, LIU Chenxu, LING Yuxiu, PAN Zhen,  HU Zhongxin, ZHOU Yu, SONG Chengli		

	Kinematic Differences Between Patients with Lumbar Disc Herniation and Healthy People in Three Daily Activities		
	Based on Refined Trunk Model	(455)	
	XU Mingxin, ZHU Ziwei, KUAI Shengzheng, LIAO Zhenhua, LIU Weiqiang		
	Experimental Study on Axial Dynamic Impact of Rabbit Single Vertebra	(463)	
	DU Yiming, ZHANG Xushu, GUO Yuan, XU Fanding, SHENG Wenqian		
	Effects of Different Surgical Methods for Treating Femoral Intertrochanteric Fracture in the Elderly and		
	Biomechanical Study	(470)	
	ZHANG Quan, ZENG Yong, SHU Xin		
	Biomechanical Comparison of Self-Developed Anatomical Locking Plate for Sternoclavicular Joint		
	ZHOU Ju, YANG Kun, SUN Yuanlin, XIANG Feifan, LIU Xuanwen, YANG Yunkang	(476)	
	Fall Risk Analysis of Elderly People with Different Load Distributions during Obstacle Crossing Based on		
	Surface Electromyography	(483)	
	WANG Xinting, YI Guofu, ZHANG Junxia, SU Hailong, REN Jianping, QIU Nian		
	In vivo Kinematic Characteristics of the Elbow during Active Flexion-Extension Motion Using Dual Fluoroscopic		
	Imaging System	(490)	
	ZOU Diyang, HU Xiangjun, HU Hai, GONG Weihua, TSAI Tsungyuan		
Re	Review Articles		
	Research Progress on Computational Hemodynamics of Pulmonary Hypertension	(497)	
	WANG Liping, ZHANG Mingjie, LIU Jinlong, XU Zhuoming		
	Research Advances in the Effect of Mechanical Regulation of Long-Chain Non-Coding RNAs on		
	Osteogenic Differentiation of Mesenchymal Stem Cells	(504)	
	CHENG Wei, LIN Xianglong, ZHANG Yang, LIU Yang, ZHU Shuanglong, LIU Yingjie, LI Ruixin, XU Yunqiang,		
	ZHANG Xizheng		
	Research Progress and Joint Evaluation on Center of Rotation for Lumbar Vertebrae	(511)	
	ZHU Ziwei, LIAO Zhenhua, LIU Weiqiang		

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.