

目次

细胞与生理学

生物钟节律与机体睡眠及免疫力交互作用的研究进展

..... 辛利清, 王朝霞, 王福媛, 赵乐(377)

海马在慢性疼痛发生发展过程中的退行性病变

..... 胡睿涵, 张衍楠, 于心同, 冯晨晨, 魏绪强, 周嘉, 王珂(383)

技术与应用

基于生物打印技术构建的化妆品功效评价三维模型应用研究

..... 李洋, 蔡茂, 张波, 惠涛涛, 郑东梅, 梁雨桐, 王琳(389)

表观遗传学在法医学物证学中的研究现状 张博, 原昱, 狄谱旭, 许凤玲, 林子清, 张璐(395)

光遗传学工具在神经系统疾病和运动中的应用研究

..... 郑益坤, 林理涵, 郑婕, 胡国鹏(402)

生态学专栏

湖南德夯地质公园林溪交错带草本群落物种多样性

..... 龙姿羽, 王志成, 赵蕊, 刘冰, 王璐, 陈功锡(409)

湖南高望界国家级自然保护区两栖爬行动物多样性调查及区系分析

..... 黄杰, 杨鑫宇, 唐依萍, 刘昕, 刘慧, 刘陈义, 谭叶琛, 张自亮, 徐培培, 张佑祥, 吴涛(419)

湖南省新邵县两栖爬行动物多样性调查及分析

..... 马艺涵, 李辉, 李松文, 李旭丰, 张贤, 张志强, 莫小阳(430)

栗瘿蜂体内一种合成生长素细菌的全基因组测序

..... 谢佳宜, 杨雪梅, 惠羽, 朱道弘, 曾杨, 杨筱慧(437)

高校教改研究与实践

基于成果导向教育理念的医学微生物学课程思政教学模式的设计与实践

..... 刘寅, 郭全乐, 赵国星, 王艳凤(444)

FC-TBL教学模式在生物制品学课程中的实践研究

..... 蒋倩倩, 刘莉莉, 李慧玲, 高宁, 程玉鹏(452)

成果导向教育下微生物学课程教学实践研究 刘艳辉, 张维强, 李佳洳(459)

图尔敏论证模型在高中生物 SSI 教学中的应用研究——以器官移植为例 高健, 阙文昕(465)

《生命科学研究》生态学专栏征稿启事 (封二)

公益广告 (封三)

CONTENTS

CELL AND PHYSIOLOGY

- Advances in the Study of Circadian Rhythms Interacting with Sleep and Immunity
..... *XIN Liqing, WANG Zhaoxia, WANG Fuyuan, ZHAO Le* (377)
- Neurodegeneration in the Hippocampus During the Progression of Chronic Pain
..... *HU Ruihan, ZHANG Ya'nan, YU Xintong, FENG Chenchen, WEI Xuqiang, ZHOU Jia, WANG Ke* (383)

TECHNOLOGY AND APPLICATION

- Application of the 3D Models for Cosmetic Efficacy Evaluation Based on Bioprinting
..... *LI Yang, CAI Mao, ZHANG Bo, XI Taotao, ZHENG Dongmei, LIANG Yutong, WANG Lin* (389)
- Research Status of Epigenetics in Forensic Genetics
..... *ZHANG Bo, YUAN Yu, DI Puxu, XU Fengling, LIN Ziqing, ZHANG Lu* (395)
- Application of Optogenetic Tools in Neurological Disorders and Physical Exercise
..... *ZHENG Yikun, LIN Lihan, ZHENG Jie, HU Guopeng* (402)

ECOLOGY

- Species Diversity of Herbaceous Communities in the Forest–creek Ecotone in Hunan Dehang Geopark
..... *LONG Ziyu, WANG Zhicheng, ZHAO Rui, LIU Bing, WANG Lu, CHEN Gongxi* (409)
- Species Diversity and Faunal Characteristics of Amphibians and Reptiles in Gaowangjie National Nature Reserve, Hunan Province
..... *HUANG Jie, YANG Xinyu, TANG Yiping, LIU Xin, LIU Hui, LIU Chenyi, TAN Yechen, ZHANG Ziliang, XU Peipei, ZHANG Youxiang, WU Tao* (419)
- Diversity Survey and Analysis of Amphibians and Reptiles in Xinshao County, Hunan Province
..... *MA Yihan, LI Hui, LI Songwen, LI Xufeng, ZHANG Xian, ZHANG Zhiqiang, MO Xiaoyang* (430)
- Whole Genome Sequencing of an Auxin–synthesizing Bacterium in *Drycosmusk kuriphilus*
..... *XIE Jiayi, YANG Xuemei, HUI Yu, ZHU Daohong, ZENG Yang, YANG Xiaohui* (437)

REFORMATION AND PRACTICE OF HIGHER EDUCATION

- Design and Application of Ideological and Political Teaching Model in Medical Microbiology Course Based on Outcome–based Education Concept
..... *LIU Yin, GUO Quanle, ZHAO Guoxing, WANG Yanfeng* (444)
- Exploration of Flipped Classroom and Team–based Learning in Bioproducts Teaching
..... *JIANG Qianqian, LIU Lili, LI Huiling, GAO Ning, CHENG Yupeng* (452)
- Teaching Practice in Microbiology Course Using Outcome–based Education
..... *LIU Yanhui, ZHANG Weiqiang, LI Jiaru* (459)
- Application of Toulmin’s Argument Model in SSI Teaching of High School Biology: Taking “Organ Transplantation” as an Example
..... *GAO Jian, KAN Wenxin* (465)