

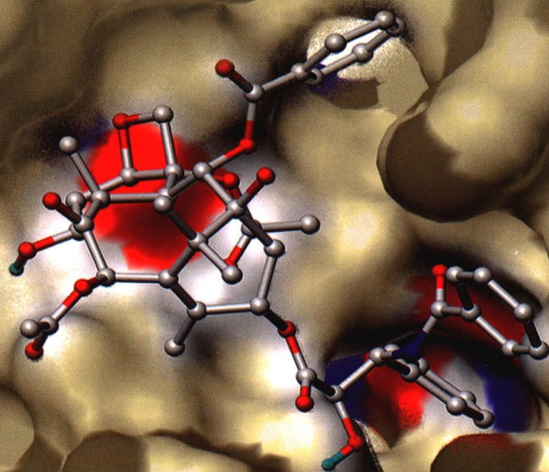
# 药 学 学 报

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本卷卷终



# Acta Pharmaceutica Sinica

### 专题报道

谭 鹏, 肖小河等

效应成分指数在中药大黄质量评价中的应用研究

张定堃, 王伽伯等

基于生物毒效检测的附子不同炮制品质量评价研究



中国药学会  
中国医学科学院药物研究所

# 药 学 学 报

第 54 卷 第 12 期 2019 年 12 月

图 文 摘 要

## 专题报道：中药质量生物评价与精准控制

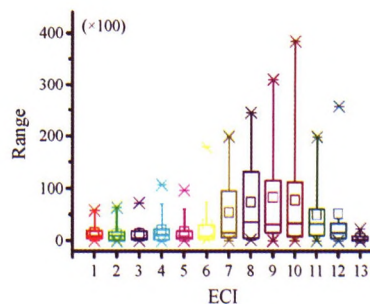
2141

### 效应成分指数在中药大黄质量评价中的应用研究

谭鹏<sup>1,2</sup>, 王伽伯<sup>3</sup>, 张定堃<sup>2</sup>, 周永峰<sup>3</sup>, 牛明<sup>3</sup>, 王梅<sup>4</sup>, 赵军宁<sup>1\*</sup>, 肖小河<sup>3\*</sup>

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这篇文章构建和应用了一种基于生物效应权重系数加权的多组分化学定量分析的大黄质量评价方法: 致泻效应成分指数。



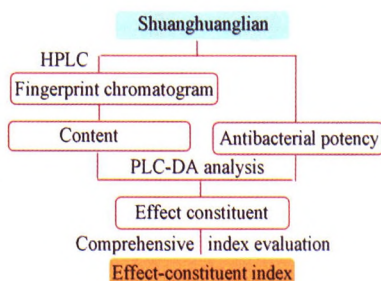
2149

### 基于效应成分指数的双黄连制剂质量控制研究

张慧, 李思雨, 冯宏玲, 李穆睿, 裴志东\*, 康廷国\*

(辽宁中医药大学药学院, 辽宁 大连 116600)

本研究借鉴抗生素抑菌效价检验方法, 结合定量指纹图谱技术, 建立了一种以临床功效为导向的、将功效作用与成分含量关联的、基于效应成分指数的双黄连制剂质量控制方法。



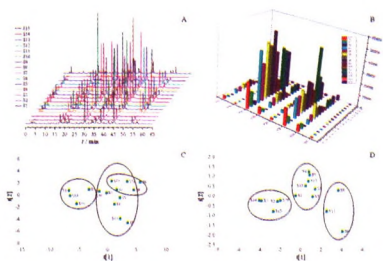
2155

### 基于抑菌效应成分指纹谱的黄芩质量评价研究

任永申\*, 邓鑫#, 雷蕾, 梁帅, 郑尧, 艾娇, 李燕, 廖矛川\*

(中南民族大学药学院, 湖北 武汉 430070)

本研究构建了直接关切黄芩抑菌活性且信息简化的抑菌效应成分指纹谱, 显著提高了中药指纹图谱的功效专属性和质量辨识能力。



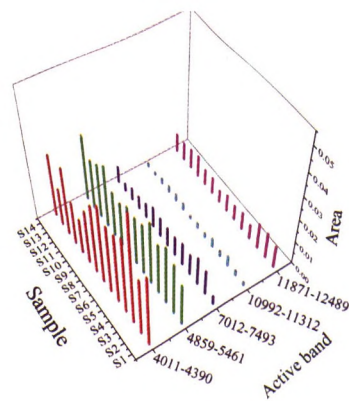
2162

### 中药效应近红外谱的构建及应用——以大黄配方颗粒为例

张萍<sup>1\*</sup>, 牛明<sup>1</sup>, 谭鹏<sup>2,3</sup>, 韩延忠<sup>1,3</sup>, 张定堃<sup>3</sup>, 孙磊<sup>4</sup>, 房吉祥<sup>1</sup>, 崔园园<sup>1</sup>, 马艳芹<sup>1</sup>, 马双成<sup>4</sup>, 周永峰<sup>1\*</sup>

(1. 中国人民解放军总医院第五医学中心, 全军中医药研究所, 北京 100039; 2. 四川省中医药科学院国家中医药管理局中药质量生物评价重点实验室, 四川 成都 610041; 3. 成都中医药大学药学院, 四川 成都 611137; 4. 中国食品药品检定研究院, 北京 100050)

通过整合生物效应和近红外光谱, 构建效应近红外谱, 并将其应用于大黄配方颗粒的质量一致性评价。

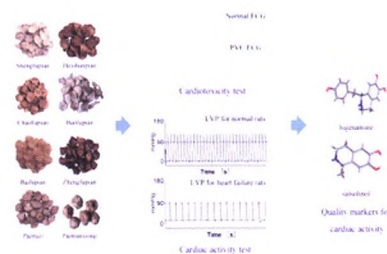


2169

基于生物毒效检测的附子不同炮制品质量评价研究

张定堃<sup>1,6</sup>, 赵志浩<sup>2</sup>, 李春雨<sup>3</sup>, 牛明<sup>2</sup>, 谭鹏<sup>4</sup>, 裴瑾<sup>1,6</sup>, 杨明<sup>5</sup>, 彭成<sup>1</sup>, 张萍<sup>2</sup>, 肖小河<sup>2</sup>, 王伽伯<sup>2\*</sup>

(1. 成都中医药大学药学院, 西南特色中药资源国家重点实验室, 四川 成都 611137; 2. 解放军总医院第五医学中心, 全军中医药研究所, 北京 100039; 3. 中国医学科学院、北京协和医学院肿瘤医院, 北京 100021; 4. 四川省中医药科学院, 国家中医药管理局中药质量生物评价重点实验室, 四川 成都 610041; 5. 江西中医药大学, 江西 南昌 330004; 6. 四川好医生攀西药业有限责任公司, 四川 西昌 615000)



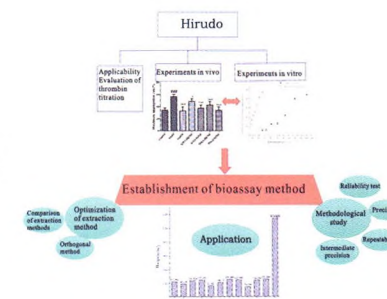
建立附子生物毒价与生物效价的质量评价方法, 发现生附片毒效均最强, 去甲乌药碱与去甲猪毛菜碱是区分生附片与各种制附片的强心质量标志物。

2178

水蛭抗血小板聚集生物效价检测方法研究

王玄<sup>1,2</sup>, 甘奇超<sup>3</sup>, 史景彦<sup>3</sup>, 胡黄婉茵<sup>2</sup>, 郝俊杰<sup>2</sup>, 邬国松<sup>2</sup>, 高倩<sup>1</sup>, 李响<sup>1</sup>, 牛明<sup>2\*</sup>, 王伽伯<sup>2\*</sup>, 马莉<sup>1\*</sup>, 肖小河<sup>2</sup>

(1. 首都医科大学中医药学院, 北京 100069; 2. 解放军总医院第五医学中心, 全军中医药研究所, 中西医结合诊疗与研究中心, 北京 100039; 3. 重庆多普泰制药股份有限公司, 重庆 401420)



采用体内体外活性关联的方法建立关联功效的水蛭的新的生物评价方法, 以评控其质量。

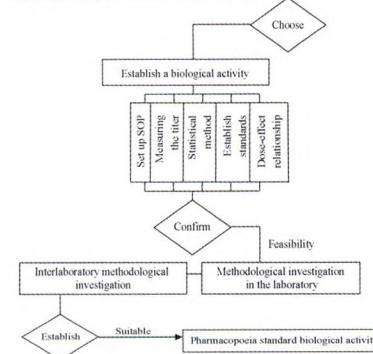
2184

复方丹参片体外抑制血小板聚集的生物活性测定法

郭玉东<sup>1</sup>, 胡宇驰<sup>1</sup>, 曹春然<sup>1</sup>, 王志斌<sup>2\*</sup>, 左泽平<sup>1</sup>, 高阳<sup>1</sup>, 娄天宇<sup>2</sup>, 马贝贝<sup>2</sup>

(1. 北京市药品检验所, 中药成分分析与生物评价北京市重点实验室, 北京 102206; 2. 北京中医药大学, 北京 100102)

The combination of internal and external tests, choose a good dose-effect relationship, reflect the function of the test system



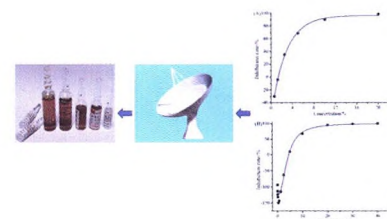
建立复方丹参片体外抑制血小板聚集的生物活性测定法, 量化复方丹参片的药理作用, 补充其质量控制方法。

2189

基于微小毒性检测的中药注射剂质量波动及安全风险预警研究进展

鄢良春, 华桦, 罗茜, 赵军宁\*

(四川省中医药科学院, 四川省中医药转化医学中心, 国家中医药管理局中药质量生物评价重点实验室, 四川省道地药材系统开发工程技术研究中心, 中药品质评价与创新中药研究四川省重点实验室, 四川省中医药管理局中药毒性快速检测实验室, 四川 成都 610041)



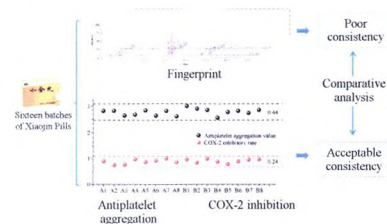
Microtox (微毒) 技术有望作为一种新的生物活性检定方法用于中药注射剂的质量波动检测及安全风险预警, 提高中药注射剂质量控制的可靠性。

2195

化学指纹图谱与活血、抗炎生物效价在小金丸整体质量评价中的适宜性对比研究

冯碧<sup>1</sup>, 曹波<sup>1</sup>, 谭鹏<sup>2</sup>, 宋娇<sup>1</sup>, 张海珠<sup>3</sup>, 许洪<sup>4</sup>, 杜晓娟<sup>4</sup>, 牛明<sup>5</sup>, 许润春<sup>1</sup>, 杨明<sup>6</sup>, 韩丽<sup>1\*</sup>, 张定堃<sup>1\*</sup>

(1. 成都中医药大学药学院, 西南特色中药资源国家重点实验室, 四川 成都 611137; 2. 四川省中医药科学院, 国家中医药管理局中药质量生物评价重点实验室, 四川 成都 610041; 3. 大理大学药学与化学学院, 云南 大理 671000; 4. 成都永康制药有限公司, 四川 成都 611137; 5. 中国人民解放军总医院第五医学中心, 全军中医药研究所, 北京 100039; 6. 江西中医药大学, 江西 南昌 330004)



测定了 16 个批次小金丸的指纹图谱和抗血小板聚集、COX-2 活性抑制生物效价, 发现化学评价结果差异大而生物效应差异较小的特殊问题, 为小金丸的整体质量评控提供了重要信息。

综述

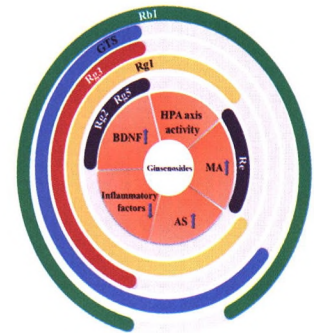
2204

人参皂苷抗抑郁作用研究进展

任思宇<sup>1,2</sup>, 王真真<sup>2</sup>, 陈乃宏<sup>1,2\*</sup>

(1. 湖南中医药大学药学院, 湖南省中药饮片标准化及功能工程技术研究中心, 湖南 长沙 410208; 2. 中国医学科学院药物研究所, 神经科学中心, 北京 100050)

人参皂苷抗抑郁作用机制。



2209

开关型嵌合抗原受体 T 细胞的研究进展

王秋霞<sup>1</sup>, 时丽丽<sup>2\*</sup>

(1. 西安交通大学医学部药学院, 陕西 西安 710061; 2. 启德医药科技(苏州)有限公司, 江苏 苏州 215000)

针对传统型 CAR-T 在体内快速大量增殖导致的不良作用, 研究人员构建了能够控制 CAR-T 细胞在体内增殖的开关型 CAR-T。此外, 开关型 CAR-T 无需重新制备 CAR-T 细胞就能够快速切换靶标, 从而节约时间和生产成本。本文将现有的开关型 CAR-T 进行总结分类。



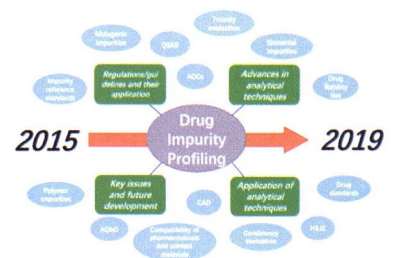
2214

化学药品杂质谱控制的现状与展望

胡昌勤\*, 张夏

(中国食品药品检定研究院, 北京 100050)

本文综述了 2015 年以来化学药品杂质控制领域在质控理念、法规、分析技术及应用等方面的进展, 并阐述亟待解决的问题和发展前景。



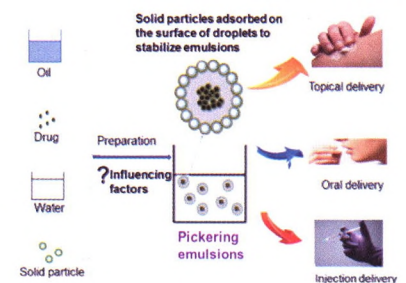
2232

Pickering 乳液给药系统的研究进展

张继芬<sup>1</sup>, 王艳华<sup>1</sup>, 李清清<sup>1</sup>, 王帆<sup>1</sup>, 易涛<sup>2\*</sup>

(1. 西南大学药学院, 重庆 400716; 2. 澳门理工学院健康科学及体育高等学校, 澳门 999078)

本文综述了 Pickering 乳液在局部、口服和注射给药方面的应用, 探讨了影响 Pickering 乳液给药系统构建的因素及其评价。



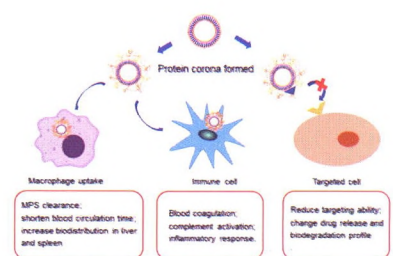
2240

血浆蛋白对脂质体体内性能的调控

官娟<sup>1,2</sup>, 陆伟跃<sup>2</sup>, 占昌友<sup>1,2\*</sup>

(1. 复旦大学基础医学院, 上海 200032; 2. 复旦大学药学院, 智能化递药教育部和全军重点实验室, 上海 201203)

脂质体进入血液循环后迅速吸附血浆蛋白, 其表面形成的蛋白冠直接影响脂质体体内各项性能。



## 研究论文

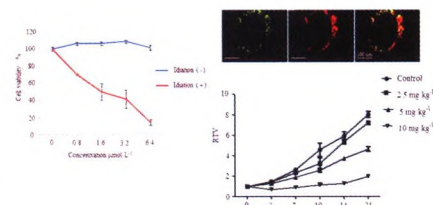
2251

### 新型光敏剂 BF01 光动力治疗人肝癌机制初步研究

谷长维\*, 张玲, 谷鸣

(上海百菲生物医药科技有限公司, 上海 201203)

光敏剂 BF01 对人肝癌细胞株 BEL-7402 的体外杀伤作用、体内抑瘤作用及其机制, 体外杀伤率为 86%, BF01 在 BEL-7402 细胞中高度特异性定位于线粒体中, BF01 介导肝癌细胞光动力治疗, 抑制小鼠肿瘤生长。



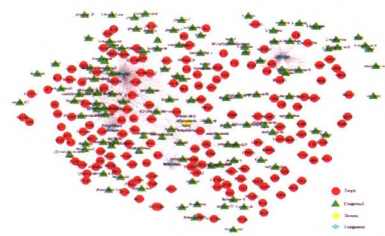
2256

### 芪蛭降糖片对链脲佐菌素诱导大鼠糖尿病足溃疡的保护作用

张舒慧<sup>1</sup>, 杜金城<sup>2</sup>, 李海云<sup>1</sup>, 林玉坤<sup>1</sup>, 杜钢军<sup>1\*</sup>

(1. 河南大学药学院药物研究所, 河南 开封 475004; 2. 湖南中医药大学中医学学院, 湖南 长沙 410208)

网络药理学解释了芪蛭降糖片复杂成分多途径多靶点防治糖尿病及其并发症的作用机制, 为其临床应用提供了理论依据。



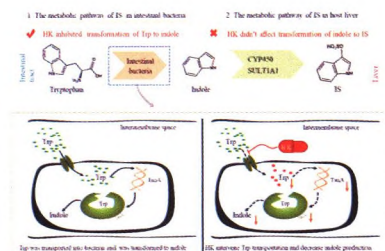
2267

### 黄葵减轻慢性肾病模型大鼠体内尿毒素蓄积的作用及机制研究

王颖异, 李建萍, 陆静波, 李成曦, 于金高, 张森, 江曙, 郭建明\*, 段金厥\*

(南京中医药大学, 江苏省中药资源产业化过程协同创新中心, 江苏 南京 210023)

黄葵通过靶向肠道菌群中的尿素素代谢通路, 干扰色氨酸向细菌内转运, 抑制细菌合成硫酸吲哚酚前体物质吲哚, 发挥降低慢性肾病大鼠体内硫酸吲哚酚蓄积的作用。



2277

### 丹桂中的一个新降倍半萜苷

江虹雨, 钟思雨, 吴利苹, 俞雅芮, 陆世惠, 李玲蕊, 李成容, 安梦琪, 黄静\*

(四川大学华西药学院, 四川 成都 610041)

从丹桂干花 95%乙醇提取物中分离得到 1 个新化合物和 5 个已知化合物, 新化合物被鉴定为 (9S)-9-hydroxymengastigm-5-en-4-one-9-O-primeveroside。



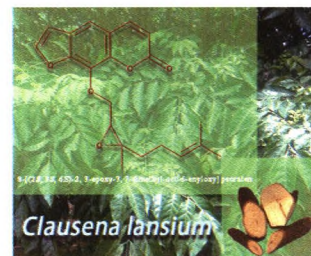
2282

### 黄皮中的新呋喃香豆素

孙兴妍, 马洁, 李创军, 黄积武, 王楠, 沈苍颀, 张东明\*

(中国医学科学院、北京协和医学院药物研究所, 天然药物活性物质与功能国家重点实验室, 北京 100050)

对黄皮 [*Clausena lansium* (Lour.) Skeels] 茎枝进行分离纯化, 得到了 3 个呋喃香豆素类化合物, 确定其结构为 psoralen8-[(2S,3S,6E)-2,3-epoxy-3,7-dimethyl-oct-6-enyloxy] psoralen (1)、8-(7',8'-epoxygeranyloxy) psoralen (2) 和 8-[(2E)-6-oxo-3,7-dimethyloct-2-enyloxy] psoralen (3), 其中化合物 1 为新化合物。化合物 2 对人大细胞肺癌细胞 (H460) 具有抑制活性 ( $IC_{50} = 43.94 \mu\text{mol}\cdot\text{L}^{-1}$ ); 化合物 3 对子宫癌细胞 (HeLa) 具有抑制活性 ( $IC_{50} = 33.76 \mu\text{mol}\cdot\text{L}^{-1}$ )。



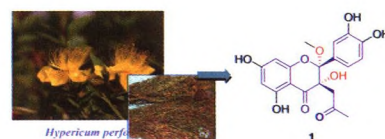
2286

### 贯叶金丝桃中一个新的 2,3-二氧代黄酮

马洁, 吉腾飞, 田晋, 王彦改, 杨建波, 苏亚伦, 王爱国\*

(中国医学科学院、北京协和医学院药物研究所, 天然药物活性物质与功能国家重点实验室, 北京 100050)

从贯叶金丝桃植物中分离得到 1 个具有罕见骨架的 2,3-二氧代黄酮化合物。



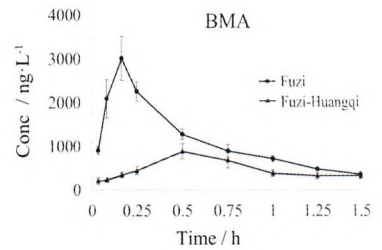
2289

**LC-MS 法研究黄芪对附子 6 种乌头生物碱大鼠药代动力学的影响**

刘玉婷<sup>1</sup>, 蒋且英<sup>2</sup>, 黄国勇<sup>1</sup>, 陈绪龙<sup>1</sup>, 廖正根<sup>1\*</sup>

(江西中医药大学 1. 现代中药制剂教育部重点实验室, 2. 实验动物科技中心, 江西 南昌 330004)

附子配伍黄芪后附子 6 种生物碱的药代动力学参数显著改变。



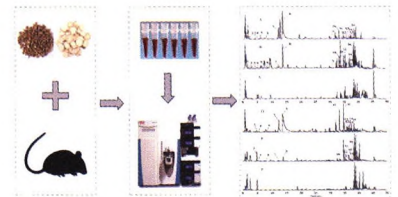
2296

**基于 UPLC-QE-Orbitrap-MS 技术的柴胡-白芍药对血清药物化学分析**

阴奇材<sup>1,2</sup>, 陈聪聪<sup>1,2</sup>, 田俊生<sup>1</sup>, 高晓霞<sup>1</sup>, 秦雪梅<sup>1</sup>, 杜冠华<sup>1,3</sup>, 周玉枝<sup>1\*</sup>

(山西大学 1. 中医现代研究中心, 2. 化学化工学院, 山西 太原 030006; 3. 中国医学科学院、北京协和医学院药物研究所, 北京 100050)

本文以中药血清药物化学为基础, 结合 UPLC-QE-Orbitrap-MS 技术, 对柴胡-白芍药对进入大鼠体内后的血中移行成分进行分析, 为后期该药对的药效物质基础及配伍规律研究提供一定的借鉴与依据。



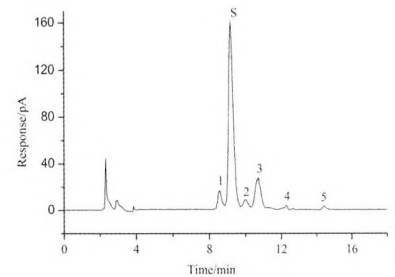
2303

**HPLC-CAD 法对黄杨宁片原料中环维黄杨星 D 和有关物质的定性定量研究**

叶晓芸<sup>1</sup>, 郭青<sup>2\*</sup>, 郭斌<sup>1</sup>, 谭力<sup>2</sup>, 黄青<sup>2</sup>, 张艳海<sup>3</sup>, 杨丹丹<sup>4</sup>, 施海蔚<sup>2</sup>

(1. 南京中医药大学, 江苏 南京 210023; 2. 江苏省食品药品监督检验研究院, 江苏南京 210019; 3. 赛默飞世尔科技(中国)有限公司, 上海 201206; 4. 中国药科大学, 江苏 南京 211198)

建立高效液相色谱-电喷雾检测 (HPLC-CAD) 法对黄杨宁片原料中环维黄杨星 D 及有关物质进行定量分析, 并用高效液相色谱串联四极杆-静电场轨道阱高分辨质谱仪联用技术 (HPLC-Q-Exactive) 对 CAD 检测中出现的有关物质进行了定性研究。



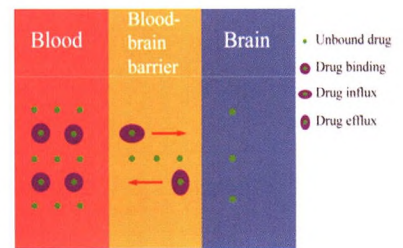
2308

**CQ 止痛复方中青藤碱和川芎嗪的脑通透性研究**

李涛, 赵小亮, 聂颖兰, 焦玥, 刘洋, 张美玉, 李玉娟, 王志国, 王丹巧<sup>\*</sup>

(中国中医科学院医学实验中心, 北京市中医药防治重大疾病基础研究重点实验室, 北京 100700)

膜通透性、血浆蛋白结合率和血脑屏障转运体外排等是影响药物脑通透性的重要因素, 本研究通过分析 CQ 止痛复方 (Chuanxiong Qingfengteng mixture, CQM) 在大鼠和小鼠的血浆、脑组织以及 Caco-2 细胞单层膜上经时变化过程, 分析各组分的血浆蛋白结合率, 从整体动物和细胞层面评估其脑通透性, 以期 CQM 发挥的中枢性作用机制提供依据。



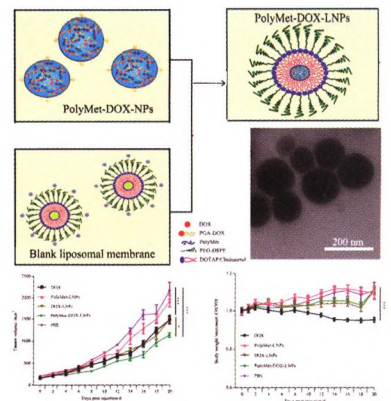
2316

**共载新型二甲双胍聚合物和多柔比星的核膜型脂质纳米粒制备及治疗乳腺癌的研究**

郑爽<sup>1#</sup>, 俞建东<sup>1,2#</sup>, 陈礼迎<sup>1</sup>, 范露慧<sup>1</sup>, 祝露佳<sup>1,3</sup>, 唐超园<sup>1</sup>, 钱柯<sup>1</sup>, 熊阳<sup>1\*</sup>

(1. 浙江中医药大学药学院, 浙江 杭州 311402; 2. 浙江康佰裕生物科技有限公司, 浙江 杭州 310051; 3. 绍兴文理学院附属医院, 浙江 绍兴 312000)

共载新型二甲双胍聚合物和多柔比星的核膜型脂质纳米粒可用于治疗乳腺癌, 并减轻多柔比星引起的毒性。



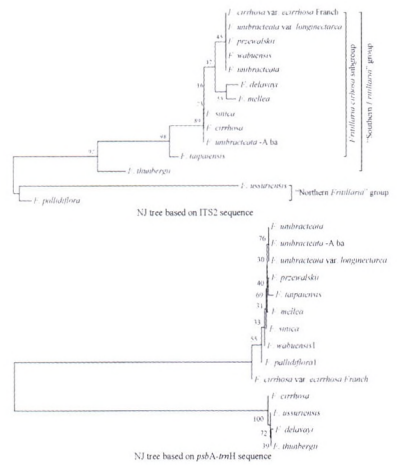
2326

基于 DNA 条形码的川贝母及其近缘种的分子鉴定与亲缘关系研究

郑辉<sup>1</sup>, 邓楷煜<sup>1</sup>, 陈安琪<sup>1</sup>, 付绍兵<sup>2</sup>, 周德<sup>3</sup>, 王威威<sup>1</sup>, 倪典墨<sup>1</sup>, 任瑶瑶<sup>1</sup>, 周嘉裕<sup>1\*</sup>, 廖海<sup>1\*</sup>

(1. 西南交通大学生命科学与工程学院, 四川 成都 610031; 2. 青海绿康生物开发有限公司, 青海 西宁 810003; 3. 阿坝州食品药品检验所, 四川 阿坝 624000)

基于 ITS2 与 *psbA-trnH* 条形码序列, 对川贝母及其近缘种开展分子生物学鉴定与亲缘关系研究, 为川贝母分子标记的开发、药用植物资源的有效保护和合理开发利用提供重要的理论依据。



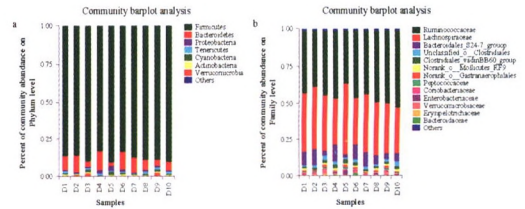
2335

基于 16S rRNA 基因测序的陕西商洛区五灵脂菌群结构分析

胡小松<sup>1</sup>, 姜丹<sup>1</sup>, 李婷<sup>1</sup>, 许贞<sup>1</sup>, 刘敬阁<sup>2\*</sup>, 刘春生<sup>1\*</sup>

(1. 北京中医药大学中药学院, 北京 102488; 2. 尚方堂中药有限公司, 甘肃 兰州 730030)

为研究五灵脂的菌群结构, 以 16s rRNA V3-V4 片段进行高通量测序发现厚壁菌门、拟杆菌门为优势菌门, 在属水平上与产短链脂肪酸高度相关, 结果显示五灵脂中携带的菌群可能为其有效成分之一。



2340

一种检测安丝菌素效价的生物检定方法——木霉平板法

李书芬<sup>#</sup>, 王静<sup>#</sup>, 孙桂芝, 张涛, 余利岩, 江冰娅, 武临专<sup>\*</sup>

(中国医学科学院、北京协和医学院医药生物技术研究所, 卫健委抗生素生物工程重点实验室, 中国医学科学院药物合成生物学重点实验室, 北京 100050)

本文报道了一种安全高效的安丝菌素生物检定方法。



1-6: Inhibition zones produced on *Trichoderma* CPCC 400749 plate by fermentation culture of *Actinosynnema pretiosum* with different ansamitocin potency

新药发现与研究实例简析

2345

以选择性为突破口的帕布昔利布的研制

郭宗儒

(中国医学科学院、北京协和医学院药物研究所, 北京 100050)

信息

《药学报》英文刊 2019 年第 6 期图文摘要

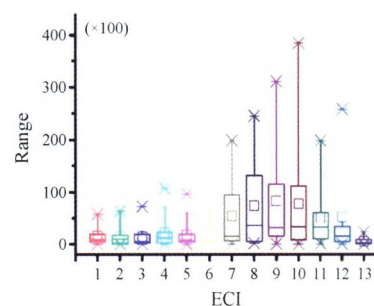
## Special Reports: Biological Evaluation and Precise Control for the Quality of Traditional Chinese Medicines

2141

### Application of an effect-constituents index for the quality evaluation of the traditional Chinese medicine rhubarb

TAN Peng<sup>1,2</sup>, WANG Jia-bo<sup>3</sup>, ZHANG Ding-kun<sup>2</sup>, ZHOU Yong-feng<sup>3</sup>, NIU Ming<sup>3</sup>, WANG Mei<sup>4</sup>, ZHAO Jun-ning<sup>1\*</sup>, XIAO Xiao-he<sup>3\*</sup>

(1. Sichuan Academy of Traditional Chinese Medicine, State Key Laboratory of Quality Evaluation of Traditional Chinese Medicine, Chengdu 610041, China; 2. College of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 3. the Fifth Medical Center of PLA General Hospital, China Military Institute of Chinese Medicine, Beijing 100039, China; 4. LU-European Center for Chinese Medicine and Natural Compounds, Institute of Biology, Leiden University, Leiden 2333BE, Netherlands)



This article developed and applied a quality evaluation method for rhubarb based on multi-components chemical quantitative analysis combined with the biopotency weight coefficients, named the diarrhea effect-constituents index.

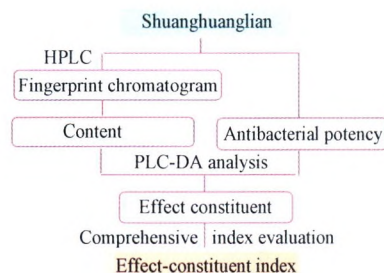
2149

### Quality control of Shuanghuanglian preparations using an effect-constituent index

ZHANG Hui, LI Si-yu, FENG Hong-ling, LI Mu-rui, PEI Zhi-dong\*, KANG Ting-guo\*

(College of Pharmacy, Liaoning University of Traditional Chinese Medicine, Dalian 116600, China)

In the study, detection method of antibiotic bacteriostatic potency and technology of quantitative fingerprint Chromatogram were used to establish a quality evaluation method of Shuanghuanglian preparations based on effect-constituent index (ECI), which is guided by clinical efficacy of Shuanghuanglian and dose-efficacy correlation.



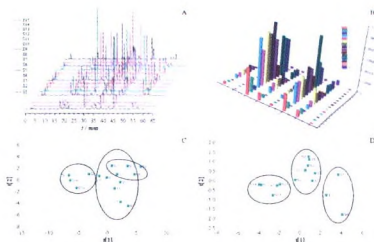
2155

### Establishment of an antibacterially effective components fingerprint for quality evaluation of Scutellariae Radix (Huangqin)

REN Yong-shen<sup>#</sup>, DENG Xin<sup>#</sup>, LEI Lei, LIANG Shuai, ZHENG Yao, AI Jiao, LI Yan, LIAO Mao-chuan\*

(School of Pharmaceutical Science, South-central University For Nationalities, Hubei Wuhan 430070, China)

In this study, the antibacterial effective components fingerprint was constructed, which directly concerned with the antibacterial activity of *Scutellaria baicalensis* with simplified information, and could significantly improve the effective specificity and quality discriminative ability of fingerprint for traditional Chinese medicine.



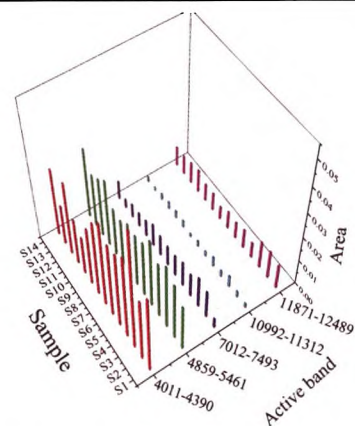


2162

### Construction and application of effect-related near-infrared spectroscopy for traditional Chinese medicines — Exemplification by rhubarb dispensing granules

ZHANG Ping<sup>1\*</sup>, NIU Ming<sup>1</sup>, TAN Peng<sup>2,3</sup>, HAN Yan-zhong<sup>1,3</sup>, ZHANG Ding-kun<sup>3</sup>, SUN Lei<sup>4</sup>, FANG Ji-xiang<sup>1</sup>, CUI Yuan-yuan<sup>1</sup>, MA Yan-qin<sup>1</sup>, MA Shuang-cheng<sup>4</sup>, ZHOU Yong-feng<sup>1\*</sup>

(1. The Fifth Medical Center of PLA General Hospital, China Military Institute of Chinese Medicine, Beijing 100039, China; 2. Sichuan Academy of Traditional Chinese Medicine, State Key Laboratory of Quality Evaluation of Traditional Chinese Medicine, Chengdu 610041, China; 3. Pharmacy College, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 4. National Institutes for Food and Drug Control, Beijing 100050, China)



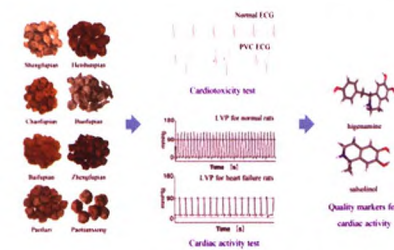
Integrating bioavailability and near infrared spectroscopy, an effective near infrared spectroscopy was constructed and applied to the quality consistency evaluation of rhubarb formula granules.

2169

### Quality evaluation of different processed products of Aconiti Lateralis Radix Praeparata combining bioassay and toxicity detection

ZHANG Ding-kun<sup>1,6</sup>, ZHAO Zhi-hao<sup>2</sup>, LI Chun-yu<sup>3</sup>, NIU Ming<sup>2</sup>, TAN Peng<sup>4</sup>, PEI Jin<sup>1,6</sup>, YANG Ming<sup>5</sup>, PENG Cheng<sup>1</sup>, ZHANG Ping<sup>2</sup>, XIAO Xiao-he<sup>2</sup>, WANG Jia-bo<sup>2\*</sup>

(1. State Key Laboratory of Characteristic Chinese Medicine Resources in Southwest China, College of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 2. China Military Institute of Chinese Medicine, the Fifth Medical Centre of Chinese People's Liberation Army General Hospital, Beijing 100039, China; 3. Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100021; 4. State Key Laboratory of Quality Evaluation of Traditional Chinese Medicine, Sichuan Academy of Traditional Chinese Medicine, Chengdu 610041, China; 5. Jiangxi University of Traditional Chinese Medicine, Nanchang 330004, China; 6. Sichuan Good Doctor Panxi Pharmaceutical Co., Ltd., Xichang 615000, China)



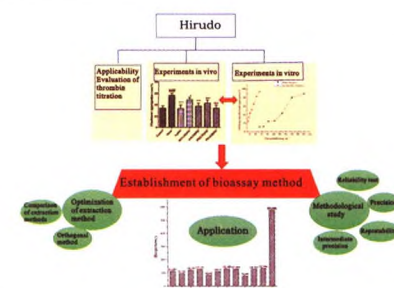
This study established the novel quality evaluation method of biological toxicity and biopotency for Aconiti Lateralis Radix Praeparata (ALRP). The results found that the toxicity and cardiac activity of Shengfupian was the strongest, and higenamine and salsolinol were the quality markers to distinguish the Shengfupian and other processed products of ALRP.

2178

### Measurement of antiplatelet aggregation and potency of hirudo

WANG Xuan<sup>1,2</sup>, GAN Qi-chao<sup>3</sup>, SHI Jing-yan<sup>3</sup>, HU Huang-wan-yin<sup>2</sup>, HAO Jun-jie<sup>2</sup>, WU Guo-song<sup>2</sup>, GAO Qian<sup>1</sup>, LI Xiang<sup>1</sup>, NIU Ming<sup>2\*</sup>, WANG Jia-bo<sup>2\*</sup>, MA Li<sup>1\*</sup>, XIAO Xiao-he<sup>2</sup>

(1. School of Traditional Chinese Medicine, Capital Medical University, Beijing 100069, China; 2. China Military Institute of Chinese Medicine, Integrative Medical Center, Fifth Medical Center, General Hospital of Chinese PLA, Beijing 100039, China; 3. Chongqing Duoputai Pharmaceutical Co., Ltd., Chongqing 401420, China)



In order to evaluate and control the quality of hirudo, a new bioassay method related to efficacy was established by pharmacodynamics experiments *in vitro* and *in vivo*.

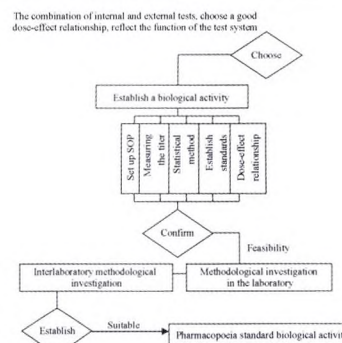
2184

### Bioassay method for Compound Danshen Tablets based on a platelet aggregation inhibition test

GUO Yu-dong<sup>1</sup>, HU Yu-chi<sup>1</sup>, CAO Cun-ran<sup>1</sup>, WANG Zhi-bin<sup>2\*</sup>, ZUO Ze-ping<sup>1</sup>, GAO Yang<sup>1</sup>, LOU Tan-yu<sup>2</sup>, MA Bei-bei<sup>2</sup>

(1. Beijing Key Laboratory of Analysis and Evaluation on Chinese Medicine, Beijing Institute for Drug Control, Beijing 102206, China; 2. Beijing University of Chinese Medicine, Beijing 100102, China)

The bioassay method for inhibiting platelet aggregation of Compound Danshen Tablets *in vitro* was established to quantify the pharmacological effects of Compound Danshen Tablets and supplement its quality control methods.

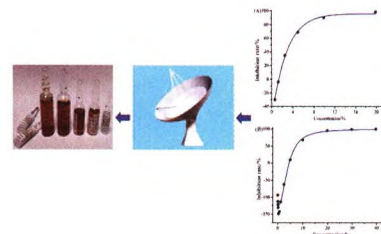


2189

**Quality evaluation and toxicity assay for injectable traditional Chinese medicine using Microtox technology**

YAN Liang-chun, HUA Hua, LUO Xi, ZHAO Jun-ning\*

(Sichuan Academy of Chinese Medicine Sciences, Sichuan Center for Translational Medicine of Traditional Chinese Medicine, Key Laboratory of Biological Evaluation of Traditional Chinese Medicine Quality of the State Administration of Traditional Chinese Medicine, Sichuan Engineering Technology Research Center of Genuine Regional Drug, Sichuan Provincial Key Laboratory of Quality Evaluation and New Drug Creation of Traditional Chinese Medicine, Laboratory for Rapid Detection of Toxicity of Traditional Chinese Medicine in Sichuan Provincial Administration of Chinese Medicine, Chengdu 610041, China)

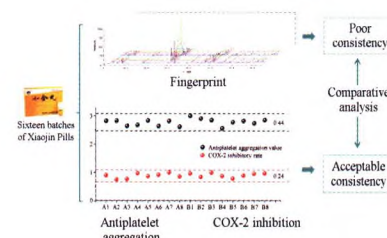


As a new method of bioactivity identification, the Microtox technology is expected to be used in the detection of quality fluctuation and safety risk early warning of traditional Chinese medicine injection, and to improve the reliability of quality control of traditional Chinese medicine injection.

2195

**Comparative study on the suitability of chemical fingerprint and anti-platelet aggregation/anti-inflammatory biopotency in the overall quality evaluation of Xiaojin pills**FENG Bi<sup>1</sup>, CAO Bo<sup>1</sup>, TAN Peng<sup>2</sup>, SONG Jiao<sup>1</sup>, ZHANG Hai-zhu<sup>3</sup>, XU Hong<sup>4</sup>, DU Xiao-juan<sup>4</sup>, NIU Ming<sup>5</sup>, XU Run-chun<sup>1</sup>, YANG Ming<sup>6</sup>, HAN Li<sup>1\*</sup>, ZHANG Ding-kun<sup>1\*</sup>

(1. State Key Laboratory of Characteristic Chinese Medicine Resources in Southwest China, College of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 2. State Key Laboratory of Quality Evaluation of Traditional Chinese Medicine, Sichuan Academy of Traditional Chinese Medicine, Chengdu 610041, China; 3. Department of Pharmacy and Chemistry, Dali University, Dali 671000, China; 4. Chengdu Yongkang Pharmaceutical Co., Ltd., Chengdu 611137, China; 5. China Military Institute of Chinese Medicine, the Fifth Medical Centre of Chinese People's Liberation Army General Hospital, Beijing 100039, China; 6. Jiangxi University of Traditional Chinese Medicine, Nanchang 330004, China)



The fingerprints and the antiplatelet aggregation, COX-2 activity inhibition biopotency were used to evaluate the quality of Xiaojin pills respectively. It was very interesting that there were obvious differences in chemical evaluation results but small differences in biological effects, which provided important information for the quality control of Xiaojin pills.

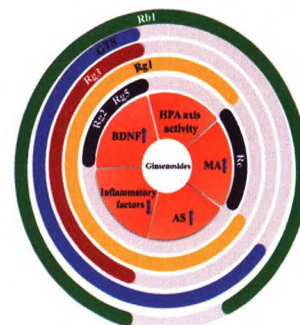
**Reviews**

2204

**Research progress on anti-depression effects of ginsenosides**REN Si-yu<sup>1,2</sup>, WANG Zhen-zhen<sup>2</sup>, CHEN Nai-hong<sup>1,2\*</sup>

(1. College of Pharmacy, Hunan University of Chinese Medicine, Hunan Engineering Technology Center of Standardization and Function of Chinese Herbal Decoction Pieces, Changsha 410208, China; 2. Institute of Materia Medica, Neuroscience Center, Chinese Academy of Medical Sciences, Beijing 100050, China)

The anti-depression mechanisms of ginsenosides.

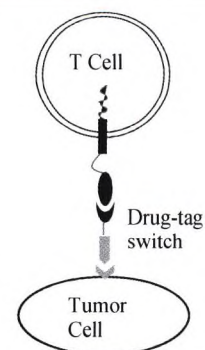


2209

**Progress in research of switchable chimeric antigen receptor T cells**WANG Qiu-xia<sup>1</sup>, SHI Li-li<sup>2\*</sup>

(1. School of Pharmacy, Health Science Center, Xi'an Jiaotong University, Xi'an 710061, China; 2. GeneQuantum Healthcare (Suzhou) Co., Ltd., Suzhou 215000, China)

In response to the side effects caused by the rapid proliferation of traditional CAR-T, researchers constructed a switchable CAR-T that controls the proliferation of CAR-T cells *in vivo*. In addition, the switchable CAR-T can replace targets rapidly without re-preparing CAR-T cells, thereby it can save time and production costs. We summarize and classify the existing switchable CAR-T in this article.

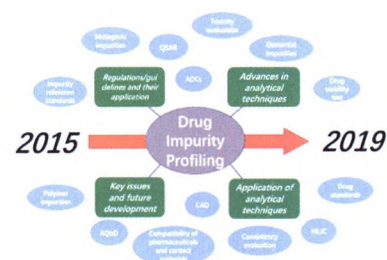


2214

**Current situation and the trend in impurity profiling of chemical drugs**HU Chang-qin<sup>\*</sup>, ZHANG Xia

(National Institutes for Food and Drug Control, Beijing 100050, China)

The progress of drug impurity profiling since 2015 in areas such as control concepts, regulations, analytical techniques and their application was reviewed in this paper and the views on future development of impurity profiling in drugs were also put forward.

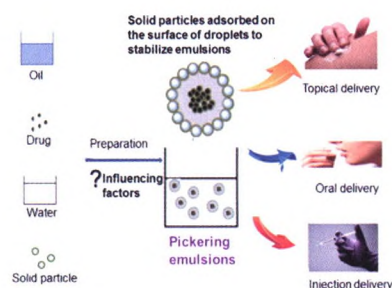


2232

**Research progress of Pickering emulsion drug delivery systems**ZHANG Ji-fen<sup>1</sup>, WANG Yan-hua<sup>1</sup>, LI Qing-qing<sup>1</sup>, WANG Fan<sup>1</sup>, YI Tao<sup>2\*</sup>

(1. College of Pharmaceutical Sciences, Southwest University, Chongqing 400716, China; 2. School of Health Sciences and Sports, Macao Polytechnic Institute, Macau 999078, China)

This article reviews the applications of Pickering emulsions in topical, oral and injectable administration, and discusses the factors affecting the preparation of Pickering emulsion drug delivery systems and their evaluations.

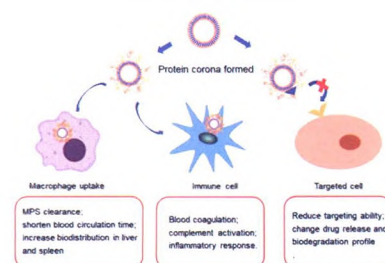


2240

**Plasma proteins regulating *in vivo* performance of liposomes**GUAN Juan<sup>2</sup>, LU Wei-yue<sup>2</sup>, ZHAN Chang-you<sup>1,2\*</sup>

(1. School of Basic Medical Sciences, Fudan University, Shanghai 200032, China; 2. Key Laboratory of Smart Drug Delivery, Ministry of Education and PLA, School of Pharmacy, Fudan University, Shanghai 201203, China)

Liposomes formed protein corona rapidly after entry into blood stream, which severely regulates *in vivo* performance of liposomes.

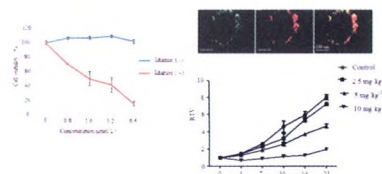
**Original Articles**

2251

**Experimental study of photodynamic therapy using a new photosensitizer BF01 for human liver cancer**GU Chang-wei<sup>\*</sup>, ZHANG Ling, GU Ming

(Shanghai Baifei Biomedical Technology Co., Ltd., Shanghai 201203, China)

*In vitro* killing effect and *in vivo* tumor inhibition effect and their mechanism on photodynamic therapy (PDT) of photosensitizer BF01 for human hepatocellular carcinoma cell line BEL-7402. The killing rate is 86%, the highly specific mitochondrial localization of BF01 in BEL-7402 cells. BF01 mediated photodynamic therapy of liver cancer cells and inhibited tumor growth in mice.

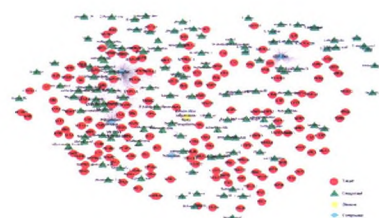


2256

**The protective effect of Qizhi hypoglycemic tablet on foot ulcer in streptozotocin-induced diabetes in rats**ZHANG Shu-hui<sup>1</sup>, DU Jin-cheng<sup>2</sup>, LI Hai-yun<sup>1</sup>, LIN Yu-kun<sup>1</sup>, DU Gang-jun<sup>1\*</sup>

(1. Institute of Pharmacy, Pharmaceutical College of Henan University, Kaifeng 475004, China; 2. College of Traditional Chinese Medicine, Hunan University of Chinese Medicine, Changsha 410208, China)

Network pharmacology explains the multi-pathway and multi-target mechanism of the complex components in Qizhi hypoglycemic tablet (QZHG) preventing and treating diabetes and its complications, and provides theoretical basis for clinical application of QZHG.



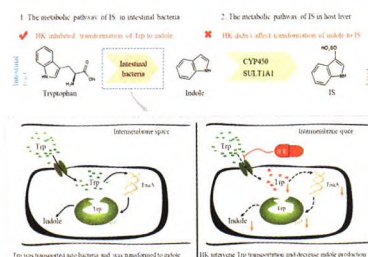
2267

**Effect and mechanism of Huangkui capsule on reduction of uremic toxin accumulation in an animal model of chronic kidney disease**

WANG Ying-yi, LI Jian-ping, LU Jing-bo, LI Cheng-xi, YU Jin-gao, ZHANG Sen, JIANG Shu, GUO Jian-ming\*, DUAN Jin-ao\*

*(Jiangsu Collaborative Innovation Center of Chinese Medicinal Resources, Nanjing University of Chinese Medicine, Nanjing 210023, China)*

By targeting the metabolic pathway of uremic toxins in gut bacteria, Huangkui capsule intervene tryptophan transportation and decrease indole production, reduce the accumulation of indoxyl sulfate in chronic kidney disease rats.



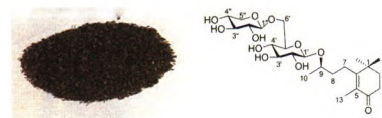
2277

**A new sesquiterpene glycoside from *Osmanthus fragrans* var. *aurantiacus***

JIANG Hong-yu, ZHONG Si-yu, WU Li-ping, YU Ya-ruj, LU Shi-hui, LI Ling-rui, LI Cheng-rong, AN Meng-qi, HUANG Jing\*

*(West China School of Pharmacy, Sichuan University, Chengdu 610041, China)*

One new compound ((9*S*)-9-hydroxymengastigm-5-en-4-one-9-*O*-primeveroside) and five known compounds were isolated from 95% ethanol extract of dried broccoli.



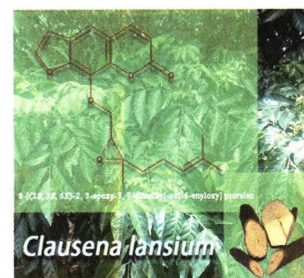
2282

**A new furocoumarin from the stems of *Clausena lansium***

SUN Xing-yan, MA Jie, LI Chuang-jun, HUANG Ji-wu, WANG Nan, SHEN Cang-jie, ZHANG Dong-ming\*

*(State Key Laboratory of Bioactive Substance and Function of Natural Medicines, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)*

One undescribed and two known furocoumarins were isolated from the stems of *Clausena lansium* through a series of isolation and purification. Their structures were determined to be 8-[(2*S*,3*S*,6*E*)-2,3-epoxy-3,7-dimethyl-oct-6-enyloxy] psoralen (**1**), 8-(7',8'-epoxygeranyloxy) psoralen (**2**) and 8-[(2*E*)-6-oxo-3,7-dimethyloct-2-enyloxy] psoralen (**3**). Compound **2** showed cytotoxicity to H460 ( $IC_{50} = 43.94 \mu\text{mol}\cdot\text{L}^{-1}$ ) and compound **3** showed cytotoxicity to HeLa ( $33.76 \mu\text{mol}\cdot\text{L}^{-1}$ ).



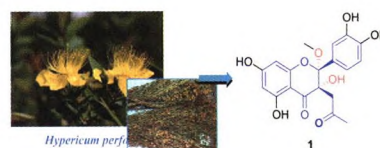
2286

**A new 2,3-dioxoflavonoid from the aerial part of *Hypericum perforatum***

MA Jie, JI Teng-fei, TIAN Jin, WANG Yan-gai, YANG Jian-bo, SU Ya-lun\*, WANG Ai-guo\*

*(State Key Laboratory of Bioactive Substance and Function of Natural Medicines, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)*

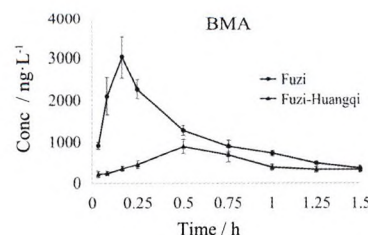
A new 2,3-dioxo-flavone with a rare skeleton isolated from *Hypericum perforatum* L.



2289

**Determining the effect of Huangqi on the pharmacokinetics of six different alkaloids from Fuzi in rats by LC-MS**LIU Yu-ting<sup>1</sup>, JIANG Qie-ying<sup>2</sup>, HUANG Guo-yong<sup>1</sup>, CHEN Xu-long<sup>1</sup>, LIAO Zheng-gen<sup>1\*</sup>*(1. Key Laboratory of Modern Preparation of Chinese Materia Medica, Ministry of Education, 2. Laboratory Animal Science and Technology Center of Jiangxi University of Traditional Chinese Medicine, Nanchang 330004, China)*

The pharmacokinetic parameters of 6 alkaloids of aconite were significantly changed after the compatibility of Fuzi with Huangqi.

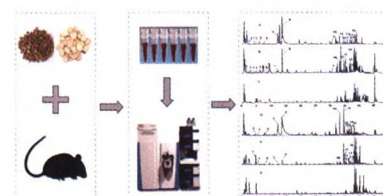


2296

### Analysis of serum pharmacochemistry from Radix Bupleuri-Radix Paeoniae Alba herb using UPLC-QE-Orbitrap-MS technology

YIN Qi-cai<sup>1,2</sup>, CHEN Cong-cong<sup>1,2</sup>, TIAN Jun-sheng<sup>1</sup>, GAO Xiao-xia<sup>1</sup>,  
QIN Xue-mei<sup>1</sup>, DU Guan-hua<sup>1,3</sup>, ZHOU Yu-zhi<sup>1\*</sup>

(1. Modern Research Center for Traditional Chinese Medicine, 2. College of Chemistry and Chemical Engineering, Shanxi University, Taiyuan 030006, China; 3. Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)



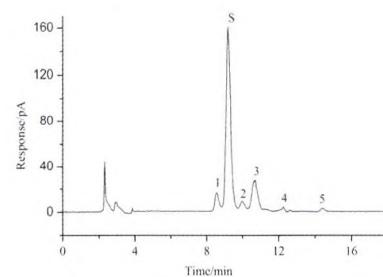
Based on the serum medicinal chemistry of traditional Chinese medicine and UPLC-QE-Orbitrap-MS technology, this paper analyzes the blood migration components of Radix Bupleuri-Radix Paeoniae Alba after entering the rat, which is the basis of the pharmacodynamics of the drug in the later stage. The study of compatibility law provides a certain reference and basis.

2303

### Qualitative and quantitative analysis of cyclovirobuxine D and related substances by HPLC-CAD in the active pharmaceutical ingredient of Huangyangning tablets

YE Xiao-yun<sup>1</sup>, GUO Qing<sup>2\*</sup>, GUO Bin<sup>1</sup>, TAN Li<sup>2</sup>, HUANG Qing<sup>2</sup>,  
ZHANG Yan-hai<sup>3</sup>, YANG Dan-dan<sup>4</sup>, SHI Hai-wei<sup>2</sup>

(1. Nanjing University of Traditional Chinese Medicine, Nanjing 210023, China; 2. Jiangsu Institute of Food and Drug Control, Nanjing 210019, China; 3. Thermo Fisher Scientific Corporation, Shanghai 201206, China; 4. China Pharmaceutical University, Nanjing 211198, China)



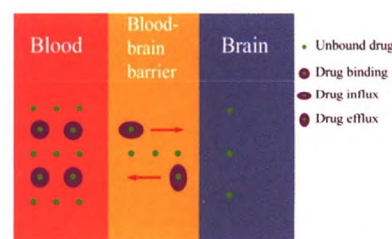
A new method was developed using HPLC-CAD (charged aerosol detector) on quantitative analysis of cyclovirobuxine D and related substances in the API of Huangyangning tablets. The related substances were further qualitatively studied by HPLC-Q-Exactive coupled with hybrid quadrupole-orbitrap mass spectrometry.

2308

### UHPLC quantification and brain permeability study of sinomenine and ligustrazine in CQM after single intravenous administration

LI Tao, ZHAO Xiao-liang, NIE Ying-lan, JIAO Yue, LIU Yang, ZHANG Mei-yu,  
LI Yu-juan, WANG Zhi-guo, WANG Dan-qiao\*

(Beijing Key Laboratory of Traditional Chinese Medicine Basic Research on Prevention and Treatment of Major Diseases, Experimental Research Center, China Academy of Chinese Medical Sciences, Beijing 100700, China)



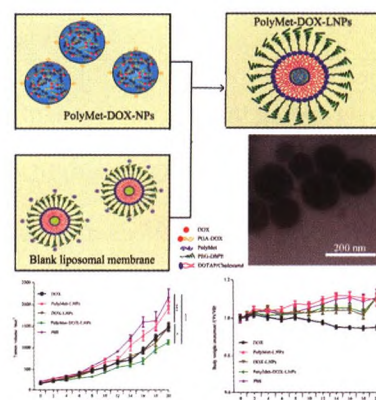
Membrane permeability, plasma protein binding rate and drug transporters in blood-brain barrier are important factors affecting drug brain permeability. The *in vivo* concentration-time profiles, plasma protein binding rate and membrane permeability of an analgesic Chuanxiong Qingfengteng mixture were systematically and thoroughly explored in this study using rats, mice and Caco-2 cells.

2316

### Preparation of lipid membrane-wrapped nanoparticles loaded with metformin polymer and doxorubicin and evaluation of their therapeutic effect on breast cancer

ZHENG Shuang<sup>1#</sup>, YU Jian-dong<sup>1,2#</sup>, CHEN Li-ying<sup>1</sup>, FAN Lu-hui<sup>1</sup>, ZHU Lu-jia<sup>1,3</sup>,  
TANG Chao-yuan<sup>1</sup>, QIAN ke<sup>1</sup>, XIONG Yang<sup>1\*</sup>

(1. College of Pharmaceutical Sciences, Zhejiang Chinese Medical University, Hangzhou 311402, China; 2. Carbiogene Therapeutics Co., Ltd., Hangzhou 310051, China; 3. Affiliated Hospital of Shaoxing University, Shaoxing 312000, China)



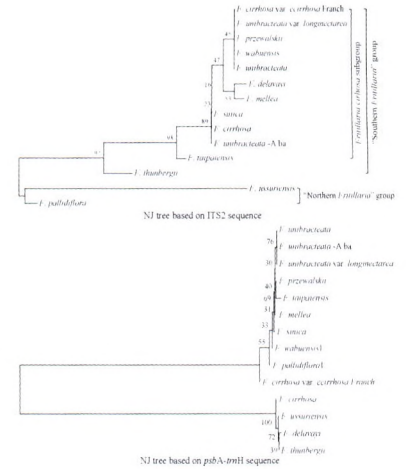
Lipid membrane-wrapped nanoparticles for the co-loading of doxorubicin (DOX) and polymeric metformin (PolyMet) to treat breast neoplasm while mitigating toxicities of DOX.

2326

**Molecular identification and genetic relationship of *Fritillaria cirrhosa* and related species based on DNA barcode**

ZHENG Hui<sup>1</sup>, DENG Kai-yu<sup>1</sup>, CHEN An-qi<sup>1</sup>, FU Shao-bing<sup>2</sup>, ZHOU De<sup>3</sup>, WANG Wei-wei<sup>1</sup>, NI Dian-mo<sup>1</sup>, REN Yao-yao<sup>1</sup>, ZHOU Jia-yu<sup>1\*</sup>, LIAO Hai<sup>1\*</sup>  
 (1. School of Life and Science, Southwest Jiaotong University, Chengdu 610031, China; 2. Qinghai Lukang Biological Development Co., Ltd., Xining 810003, China; 3. Aba Food and Drug Inspection, Aba 624000, China)

Based on the ITS2 and *psbA-trnH* sequences, molecular biological identification and genetic relationship of *Fritillaria cirrhosa* with its relative species were carried out. Therefore, it provided an important theoretical foundation for the development of molecular markers, effective protection, and rational development and utilization of *Fritillaria* resources.

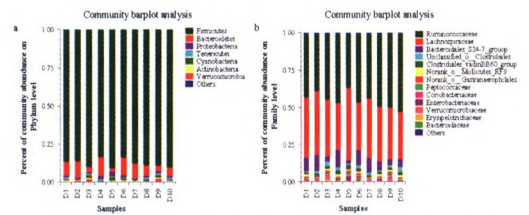


2335

**Diversity of microbiota composition of traditional Chinese medicine of Faeces Trogopterori from Shangluo, Shanxi province by sequence of the bacterial 16S rRNA gene**

HU Xiao-song<sup>1</sup>, JIANG Dan<sup>1</sup>, LI Ting<sup>1</sup>, XU Zhen<sup>1</sup>, LIU Jing-ge<sup>2\*</sup>, LIU Chun-sheng<sup>1\*</sup>  
 (1. School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing 102488, China; 2. Shang Fang Tang Traditional Chinese Medicine Limited Company, Lanzhou 730030, China)

To obtain the microbial composition of traditional Chinese medicine of Faeces Trogopterori, V3-V4 of 16S rRNA gene was used as molecular marker to explore the microbiome. The dominant phylum microbial communities in these samples were Firmicutes and the Bacteroidetes, and highly correlated with short-chain fatty acids at the genus level, provided that the beneficial bacteria in Faeces Trogopterori may be one of its active ingredients.

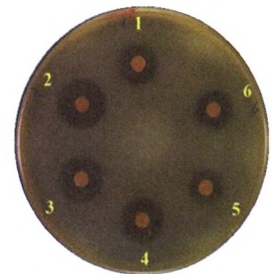


2340

**Bioassay of ansamitocin by *Trichoderma* plate**

LI Shu-fen<sup>#</sup>, WANG Jing<sup>#</sup>, SUN Gui-zhi, ZHANG Tao, YU Li-yan, JIANG Bing-ya, WU Lin-zhuan<sup>\*</sup>  
 (NHC Key Laboratory of Biotechnology of Antibiotics, CAMS Key Laboratory of Synthetic Biology for Drug Innovation, Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)

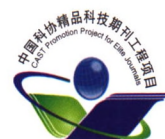
A bioassay method was developed to determine the fermentation potency of ansamitocin.



1-6: Inhibition zones produced on *Trichoderma* CPCC 400749 plate by fermentation culture of *Actinosynnema pretiosum* with different ansamitocin potency

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