

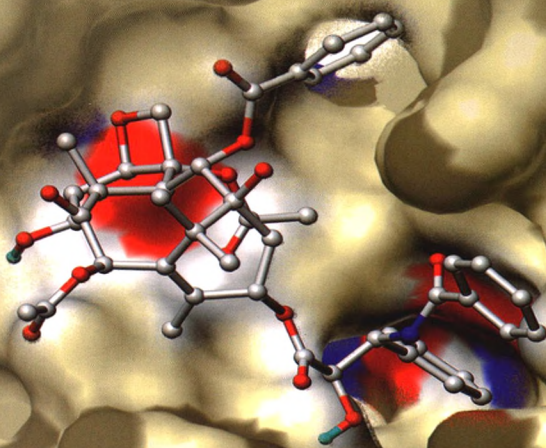


# 药 学 学 报

第55卷

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# Acta Pharmaceutica Sinica

### 专家论坛

顾 婧, 尤启冬等

靶向PRC2相关蛋白小分子抑制剂的  
研究进展

万方数据

### 研究论文

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细胞周期抑制因子p21活化巨噬细  
胞促进小鼠肺纤维化发生发展



中国药学会  
中国医学科学院药物研究所

# 药 学 学 报

第 55 卷 第 8 期 2020 年 8 月

## 图 文 摘 要

### 专家论坛

1707

#### 例解生物学驱动的药物设计

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)

本文以上市的或处于临床试验的药物研发要点, 尝试解析生物学驱动的研发理念。

1726

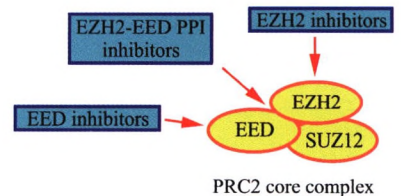
#### 靶向 PRC2 相关蛋白小分子抑制剂的研究进展

顾婧<sup>1,2</sup>, 郭小可<sup>1,2\*</sup>, 尤启冬<sup>1,2\*</sup>

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2. 中国药科大学药学院, 江苏 南京 211198)

本文简要介绍了 PRC2 复合物的生物学功能, 并综述了各类靶向 PRC2 相关蛋白小分子抑制剂的研究进展。



### 综述

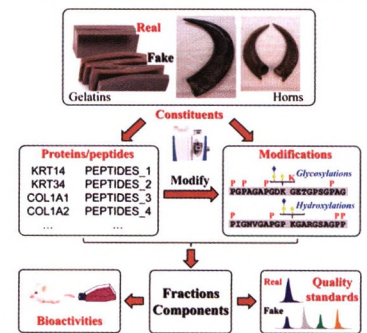
1735

#### 基于“蛋白质/肽组学-修饰组学”研究动物药功效物质基础的思路与方法

刘睿<sup>1,2,3</sup>, 赵明<sup>1,3</sup>, 段金庵<sup>1,3\*</sup>

(1. 南京中医药大学, 中药资源产业化与方剂创新药物国家地方联合工程研究中心/江苏省中药资源产业化过程协同创新中心, 江苏 南京 210023; 2. 南京中医药大学, 江苏省海洋药用生物资源研究与开发重点实验室, 江苏 南京 210023; 3. 南京中医药大学药学院, 江苏 南京 210023)

基于“蛋白质组-修饰组”研究思路揭示动物药传统功效与物质基础关联, 促进中药动物药现代化研究与应用。



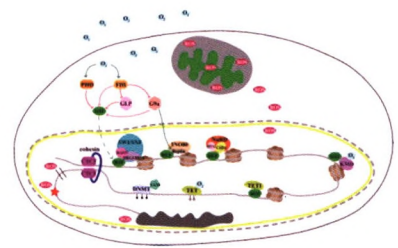
1744

#### 氧气对基因组的结构与化学影响

侯春英, 卢多\*

(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)

本文从活性氧、铁离子和缺氧 3 个方面汇总氧气对基因组产生的影响, 并简单讨论相关的药物。



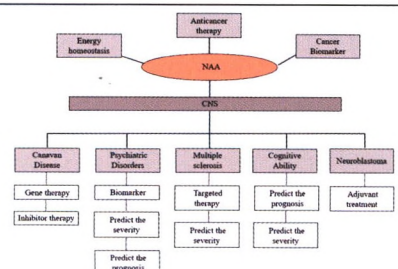
1754

#### N-乙酰天冬氨酸在中枢神经系统中的研究进展

曹琳玉, 丁虹琬, 姚开云, 张建军, 王贵彬\*

(中国医学科学院、北京协和医学院药物研究所, 新药作用机制研究和药效评价北京市重点实验室, 北京 100050)

N-乙酰天冬氨酸 (NAA) 对许多疾病具有预测、诊断的前景, 靶向治疗方式可能成为难治性疾病的突破口。



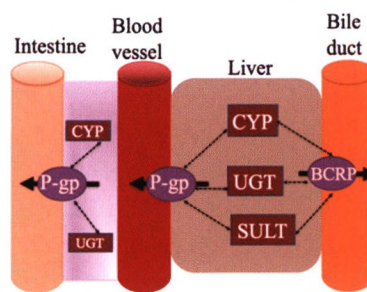
1762

药物转运体与代谢酶间的协作关系对肠肝药物处置的影响

周燕<sup>1,2</sup>, 武新安<sup>2</sup>, 邓毅<sup>1,3\*</sup>

(1. 甘肃中医药大学药学院, 甘肃 兰州 730000; 2. 兰州大学第一医院药剂科, 甘肃 兰州 730000; 3. 甘肃省高校中(藏)药化学与质量研究省级重点实验室, 甘肃 兰州 730000)

肠肝药物转运体与代谢酶间的协作关系。



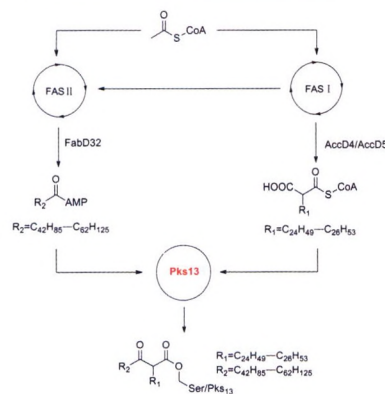
1768

结核分枝杆菌聚酮合成酶 13 抑制剂的研究进展

丁威, 赵文婷, 张东峰\*

(中国医学科学院、北京协和医学院药物研究所, 活性物质发现与适药化研究北京市重点实验室, 中国医学科学院抗耐药结核创新药物研究重点实验室, 北京 100050)

聚酮合成酶 13 (polyketide synthase 13, Pks13) 是非常有前景的抗结核药物作用靶标。本文将简要介绍目前 Pks13 抑制剂的研究进展。



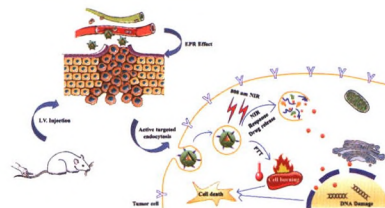
1774

基于纳米共载策略的光热治疗联合化疗抗肿瘤研究进展

胥海婷, 吴亿晗, 石金凤, 李佳鑫, 章津铭\*, 傅超美\*

(成都中医药大学药学院, 四川 成都 611137)

采用纳米载体共递送光热试剂和化疗药物可达到协同增效的抗肿瘤效果, 为肿瘤多模式联合治疗进一步发展提供参考。



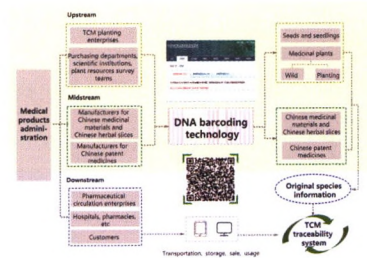
1784

DNA 条形码技术在中药全产业链的应用进展

娄千<sup>1,2</sup>, 辛天怡<sup>1</sup>, 宋经元<sup>1,3\*</sup>

(1. 中国医学科学院、北京协和医学院药用植物研究所, 国家中医药管理局中药资源保护重点研究室, 北京 100193; 2. 北京中医药大学, 北京 102488; 3. 中药资源教育部工程研究中心, 北京 100193)

本文从中药全产业链的角度综述 DNA 条形码技术在中药种植、生产、流通及使用等环节的应用现状。



研究论文

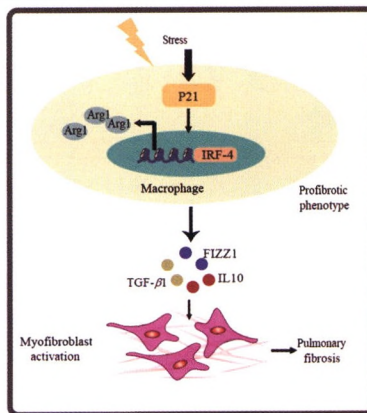
1792

细胞周期抑制因子 p21 活化巨噬细胞促进小鼠肺纤维化发生发展

魏旭鹏<sup>1</sup>, 王婉玉<sup>2</sup>, 李云炫<sup>2</sup>, 刘畅<sup>2</sup>, 吕晓希<sup>2</sup>, 赵燕燕<sup>1\*</sup>, 刘姗姗<sup>2\*</sup>

(1. 河北大学药学院, 河北 保定 071000; 2. 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)

本研究发现博来霉素损伤导致肺部巨噬细胞中 p21 表达增加, 过表达的 p21 通过诱导巨噬细胞活化促进肺纤维化发病。



1801

隐丹参酮改善小鼠化疗性肠黏膜炎的作用及机制研究

王霖<sup>1</sup>, 王睿<sup>2</sup>, 魏广义<sup>2</sup>, 王淑美<sup>2</sup>, 杜冠华<sup>1\*</sup>

(1. 中国医学科学院、北京协和医学院药物研究所, 药物靶点研究与新药筛选北京市重点实验室, 北京 100050; 2. 广东药科大学, 广东 广州 510006)

隐丹参酮可能通过调控粪便菌群及脂质代谢, 抑制炎症因子表达, 有效改善小鼠化疗性肠黏膜炎。



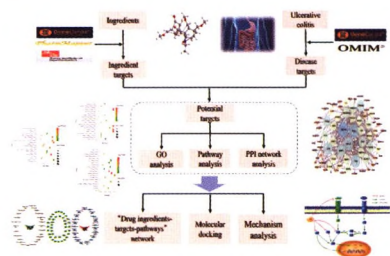
1812

基于网络药理-分子对接研究附子理中丸治疗溃疡性结肠炎的作用机制

黄友, 杨莎莎, 林夏, 赵生嘉, 魏馨怡, 傅超美\*, 张臻\*

(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)

本文通过网络药理学和生物信息学技术预测了附子理中丸治疗溃疡性结肠炎的关键靶点和作用机制。



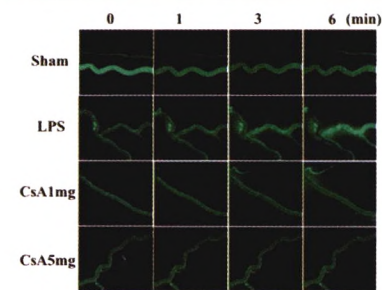
1823

环孢素 A 对脓毒症大鼠血管通透性的保护作用

吴跃, 朱娉, 张杰, 田昆仑, 彭小勇, 向鑫明, 刘良明, 李涛\*

(陆军军医大学大坪医院第二研究室, 创伤、烧伤与复合伤国家重点实验室, 重庆 400042)

环孢素 A (CsA) 可通过抑制线粒体通透性转换孔 (MPTP) 开放保护线粒体功能, 进而发挥对脓毒症大鼠血管通透性的保护作用。



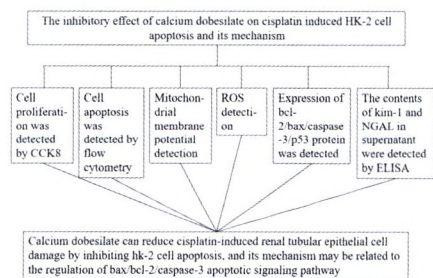
1830

羟苯磺酸钙对顺铂诱导的 HK-2 细胞凋亡的抑制作用及其机制

任春霞, 朱李飞, 余自成\*

(同济大学附属杨浦医院药学部, 上海 200090)

文章首次探讨了羟苯磺酸钙对顺铂所致肾小管上皮细胞损伤的作用及其作用机制。



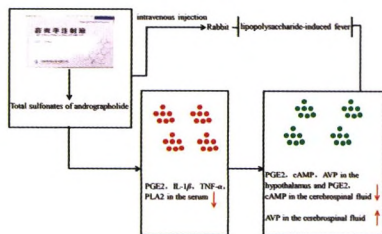
1836

喜炎平注射液对细菌内毒素脂多糖致热家兔的解热作用

郑晨<sup>1</sup>, 蒋春红<sup>2</sup>, 曾君南<sup>2</sup>, 戴岳<sup>1</sup>, 魏志凤<sup>1\*</sup>

(1. 中国药科大学中药学院, 江苏 南京 210000; 2. 江西青峰药业有限公司创新天然药物与中药注射剂国家重点实验室, 江西 赣州 341000)

喜炎平注射液可显著改善 LPS 所致家兔发热, 该作用与调节血清、下丘脑和脑脊液中 PGE2、TNF-α、IL-1β、PLA2、cAMP 和 AVP 水平密切相关。



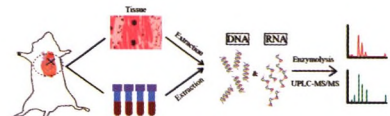
1841

液质联用法测定大鼠心力衰竭过程中全基因组 DNA 及总 RNA 的甲基化水平变化

常继硕<sup>1,2</sup>, 林忠晓<sup>1</sup>, 张燕芬<sup>1</sup>, 胡渊<sup>1</sup>, 余细勇<sup>1,2\*</sup>

(1. 广州医科大学药学院、广东省分子靶标与临床药理学重点实验室, 广东 广州 511436; 2. 广州医大新药创制有限公司, 广东 广州 511436)

对大鼠心梗前后组织及外周血淋巴细胞进行提取及酶解后, 利用液质检测各组 DNA 及 RNA 的甲基化水平变化, 发现两者的甲基化率增加且呈现同步性。



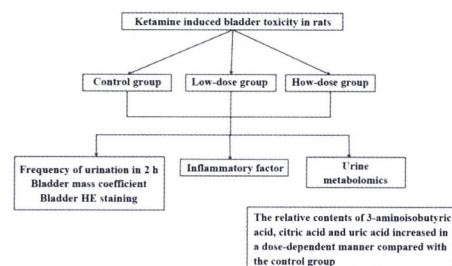
1849

## 基于代谢组学探索氯胺酮膀胱毒性相关的尿液差异代谢物

吴知桂<sup>1</sup>, 殷文贤<sup>2</sup>, 罗宏丽<sup>1</sup>, 司元楷<sup>1</sup>, 孙梦琦<sup>1</sup>, 廖林川<sup>3\*</sup>

(1. 西南医科大学附属第一医院药理学部, 四川 泸州 646000; 2. 西南医科大学附属中医医院药理学部, 四川 泸州 646000; 3. 四川大学华西基础与法医学院, 四川 成都 610041)

氯胺酮诱导膀胱毒性可能与 3-氨基异丁酸、柠檬酸和尿酸这 3 种代谢物及其相关代谢途径密切相关。

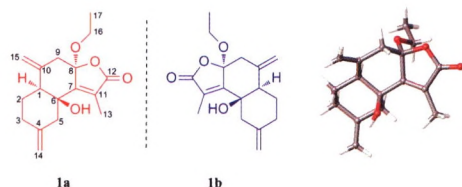


1855

宽叶金粟兰中 **1** 对具有神经保护活性的倍半萜对映体

陈芳有, 李宏焘, 陈杰, 双鹏程, 罗永明\*

(江西中医药大学药学院, 江西 南昌 330004)

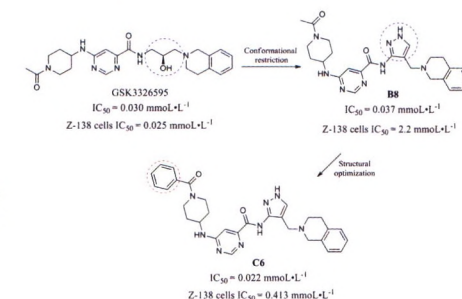
从宽叶金粟兰中分离得到 **1** 对具有神经保护活性的倍半萜对映体。

1859

## 蛋白质精氨酸甲基转移酶 5 抑制剂的设计、合成及活性评价

朱康乐<sup>1,2</sup>, 王亚洲<sup>2\*</sup>, 尤启冬<sup>1\*</sup>

(1. 江苏省药物分子设计与成药性优化重点实验室, 中国药科大学, 江苏 南京 210009; 2. 南京圣和药业股份有限公司, 江苏 南京 210000)

本文对 GSK3326595 进行结构优化, 使用构象限制原理设计合成了 16 个化合物, 经过生物学评价发现化合物 **B8** 和 C 系列 6 个化合物均具备与 GSK3326595 相当的 PRMT5 抑制活性。

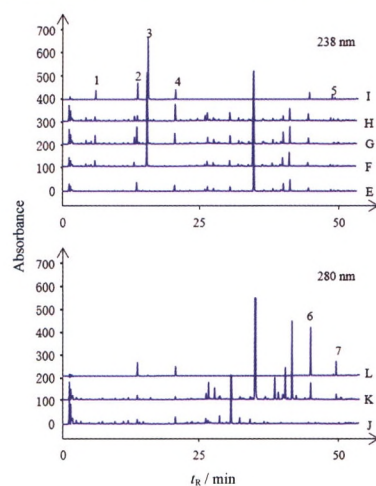
1872

## UHPLC 法测定经典名方清金化痰汤物质基准中多指标成分的含量

刘静, 刘然, 李丹丹, 许华容, 李清, 毕开顺\*

(沈阳药科大学, 辽宁 沈阳 110016)

建立了超高效液相色谱法测定经典名方清金化痰汤物质基准中山梔子苷 B、梔子苷、新芒果苷、芒果苷、黄芩素、汉黄芩素、甘草酸 7 个指标成分的含量。



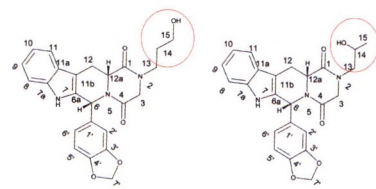
1877

## 一种他达拉非衍生物的发现与鉴定

冯亭亭<sup>1,2,3</sup>, 孙健<sup>2</sup>, 张静娴<sup>2</sup>, 于泓<sup>2</sup>, 冯睿<sup>2</sup>, 张甦<sup>2</sup>, 毛秀红<sup>2</sup>, 胡青<sup>2\*</sup>, 季申<sup>1,2\*</sup>

(1. 中国医药工业研究总院, 上海 201203; 2. 上海市食品药品检验所, 国家药品监督管理局中药质量控制重点实验室, 上海 201203; 3. 河北北方学院, 河北 张家口 075000)

采用超高效液相色谱串联四级杆-飞行时间高分辨质谱从两种咖啡饮品中检测到一种新型他达拉非衍生物。



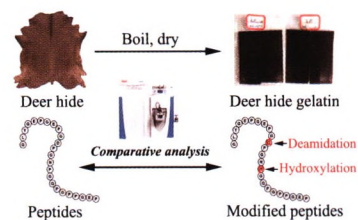
3-Hydroxypropylnortadalafilil 2-Hydroxypropylnortadalafilil

1882

基于“多肽组-修饰组”比较分析鹿皮与鹿皮胶物质基础

刘睿<sup>1,2,3</sup>, 朱悦<sup>1,3</sup>, 郑云枫<sup>1,3</sup>, 赵明<sup>1,3</sup>, 刘逊<sup>4</sup>, 黄勇<sup>5</sup>, 徐浩坤<sup>5</sup>, 段金殿<sup>1,3\*</sup>

(1. 南京中医药大学, 中药资源产业化与方剂创新药物国家地方联合工程研究中心/江苏省中药资源产业化过程协同创新中心, 江苏 南京 210023; 2. 南京中医药大学, 江苏省海洋药用生物资源研究与开发重点实验室, 江苏 南京 210023; 3. 南京中医药大学药学院, 江苏 南京 210023; 4. 苏州卫生职业技术学院, 江苏 苏州 215009; 5. 贵州广济堂药业有限公司, 贵州 贵阳 550014)



基于“修饰组”策略系统比较分析鹿皮与鹿皮胶中主要修饰类型的变化及规律。

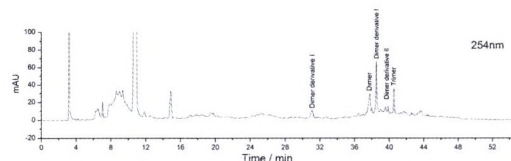
1889

头孢他啶原料及制剂的聚合物杂质分析

李进, 姚尚辰, 尹利辉, 许明哲\*, 胡昌勤

(中国食品药品检定研究院, 北京 102629)

RP-HPLC 法能够检出头孢他啶二聚体及其衍生物、三聚体等 4 种聚合物杂质峰, 专属性好、灵敏度高、方法耐用性好, 可用于头孢他啶的聚合物杂质质控。



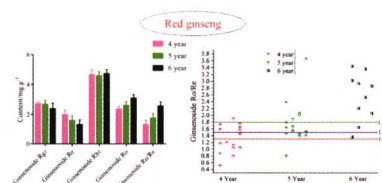
1897

基于人参皂苷 Ro/Re 比例的红参质量标准研究

杨远贵<sup>1</sup>, 杨颖博<sup>1,3</sup>, 鞠政财<sup>1</sup>, 张艳海<sup>1</sup>, 杨莉<sup>1,2\*</sup>, 王峥涛<sup>1,2\*</sup>

(1. 上海中医药大学中药研究所, 中药标准化教育部重点实验室, 国家中医药管理局中药新资源与质量评价重点实验室, 上海 201203; 2. 上海中药标准化研究中心, 上海 201203; 3. 江苏康缘制药有限公司, 江苏 连云港 222001)

采用核壳色谱技术构建了红参的人参皂苷 Rg<sub>1</sub>、Re、Rb<sub>1</sub> 和 Ro HPLC 色谱方法; 采用人参皂苷 Ro/Re 比例鉴别不同生长年限的红参。



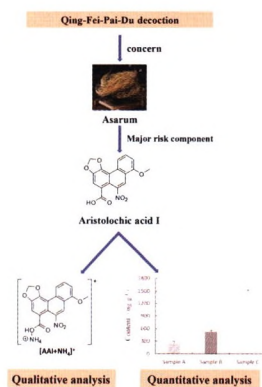
1903

基于液相色谱-质谱联用的清肺排毒汤中痕量马兜铃酸 I 的监测及定量分析

陈奕君<sup>1,2</sup>, 王伟<sup>2\*</sup>, 肖红斌<sup>1,2\*</sup>

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本文通过构建 UHPLC-Q TOF-MS/MS 及 UHPLC-QQQ-MS/MS 联用技术, 对清肺排毒汤中超量使用的细辛中的潜在毒性成分马兜铃酸 I 进行了准确高效的定性及定量分析; 并在此基础上, 进一步对比分析了复方、细辛水煎液及细辛 70% 甲醇提取液中马兜铃酸 I 的含量, 从而为细辛在复方中的合理使用提供了科学依据。



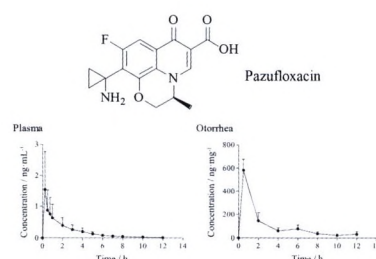
1908

LC-MS/MS 法测定血浆及耳溢液中帕珠沙星: 滴耳液药动学研究

沈思齐<sup>1,2</sup>, 李冉冉<sup>2</sup>, 马媛媛<sup>2</sup>, 林海霞<sup>1</sup>, 陈笑艳<sup>1,2\*</sup>

(1. 上海大学理学院, 上海 200444; 2. 中国科学院上海药物研究所, 上海 201203)

帕珠沙星滴耳液是一种喹诺酮类局部使用制剂, 本文建立了具有高灵敏度的 LC-MS/MS 法测定人血浆及耳溢液中帕珠沙星的浓度, 并成功应用于慢性化脓性中耳炎患者单次使用甲磺酸帕珠沙星滴耳液的系统及局部药动学研究。

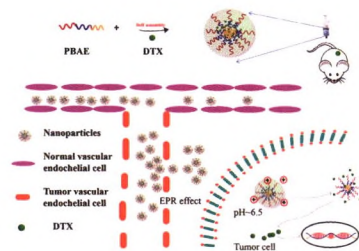


1914

pH 敏感多西紫杉醇纳米胶束的制备及其增强小鼠的抑瘤活性研究

郝单丽#, 王杰#, 谢冉, 岳巧欣, 易红, 臧琛, 赵庆贺\*, 陈燕军\* (中国中医科学院中药研究所, 北京 100700)

pH 值响应多西紫杉醇 (DTX) 纳米胶束 (PBAE-DTX) 可在高渗透长滞留 (EPR) 效应下穿透肿瘤组织中的微血管并在肿瘤组织蓄积, 被肿瘤细胞摄取后在肿瘤细胞内酸性环境下快速释放出药物杀伤肿瘤细胞。

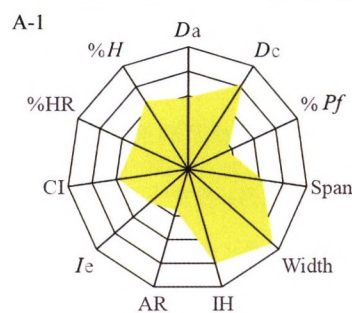


1923

羧甲基纤维素钠质量一致性评价及性能参数智能可视化研究

张孝娜<sup>1,2#</sup>, 孙会敏<sup>2#\*</sup>, 王珏<sup>2</sup>, 杨锐<sup>2</sup>, 张雪梅<sup>3</sup>, 刘万卉<sup>3</sup>, 丁嘉信<sup>3</sup>, 戴传云<sup>4\*</sup>, 孙考祥<sup>1,3\*</sup> (1. 烟台大学, 新型制剂与生物技术药物研究山东省高校协同创新中心, 分子药理和药物评价教育部重点实验室 (烟台大学), 山东 烟台 264005; 2. 中国食品药品检定研究院, 国家药品监督管理局药用辅料质量研究与评价重点实验室, 北京 100050; 3. 山东绿叶制药有限公司, 长效和靶向制剂国家重点实验室, 山东 烟台 264003; 4. 重庆科技学院生物与制药工程技术研究院, 重庆 401331)

本文通过物理指纹图谱评价不同来源的羧甲基纤维素钠质量一致性。

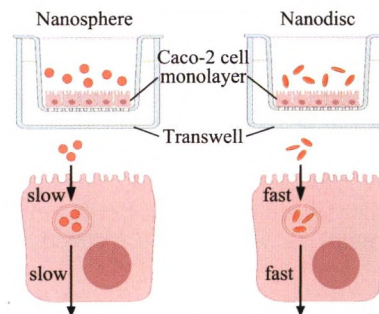


1932

硅质体的形状对其跨 Caco-2 细胞单层转运的影响

张润宇<sup>1</sup>, 宋阳<sup>1</sup>, 陈晴<sup>1</sup>, 邓海亮<sup>1</sup>, 张华<sup>1</sup>, 代文兵<sup>1</sup>, 何冰<sup>1</sup>, 陈英<sup>2</sup>, 张强<sup>1</sup>, 王学清<sup>1\*</sup> (1. 北京大学药学院, 北京 100191; 2. 广东省药品检验所, 广东 广州 510700)

本研究制备了圆球形硅质体与圆盘状纳米盘, 与硅质体相比, 纳米盘显示出更快的细胞摄取和跨过 Caco-2 细胞单层的能力。

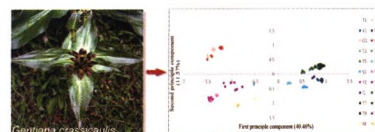


1941

藏药解吉那保基原植物粗茎秦艽品种鉴定及种内遗传多样性分析

宗粉粉<sup>1</sup>, 赵志礼<sup>1\*</sup>, 倪梁红<sup>1</sup>, 嘎务<sup>2</sup>, 刘铜华<sup>2,3</sup> (1. 上海中医药大学, 上海 201203; 2. 西藏藏医药大学, 西藏 拉萨 850000; 3. 北京中医药大学, 北京 100029)

藏药解吉那保基原植物粗茎秦艽的鉴定及其 AFLP 分析。

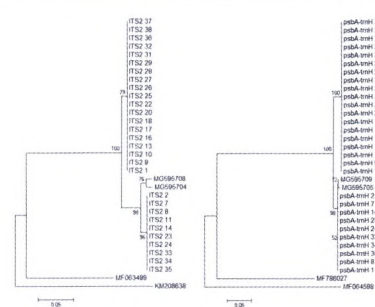


1951

陕西关中野生商陆资源的 ITS2 和 psbA-trnH 条形码序列研究

吕瑞华<sup>1</sup>, 冯昭<sup>1</sup>, 马添翼<sup>1</sup>, 吕蕊花<sup>1</sup>, 张明英<sup>2</sup>, 彭亮<sup>2</sup>, 高静<sup>2</sup>, 张岗<sup>2\*</sup> (1. 陕西中医药大学医学技术学院, 陕西 咸阳 712046; 2. 陕西中医药大学药学院/陕西省秦岭中草药应用开发工程技术研究中心, 陕西 咸阳 712046)

ITS2 和 psbA-trnH 可作为商陆及其混伪品鉴别的条形码序列。鉴定分析显示陕西关中野生商陆资源主要为商陆 P. acinosa 和垂序商陆 P. americana 两个种。

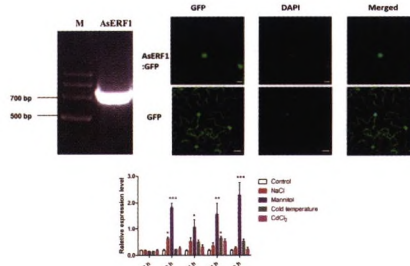


1957

白木香 AsERF1 基因的克隆、亚细胞定位与表达分析

李铁铮<sup>1#</sup>, 郑一哲<sup>1#</sup>, 戎玉清<sup>1</sup>, 魏胜利<sup>2</sup>, 王晓晖<sup>1,2\*</sup>, 屠鹏飞<sup>1\*</sup> (1. 北京中医药大学中药学院中药现代研究中心, 北京 100029; 2. 北京中医药大学中药学院中药资源与鉴定系, 北京 100029)

本研究从白木香中克隆得到一条新的 AsERF1 基因, AsERF1 定位于植物细胞核, 其表达水平能够被盐、干旱、低温和重金属胁迫诱导。



## 新药论坛

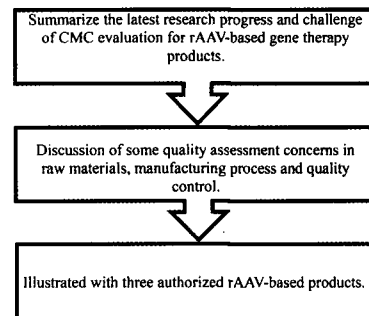
1965

### 关于重组腺相关病毒基因治疗制品药学评价的思考

刘伯宁, 徐隆昌, 韩冬梅, 罗建辉\*

(国家药品监督管理局药品审评中心, 北京 100022)

本文结合国际上已获批上市的重组腺相关病毒 (rAAV) 制品审评实例, 对 rAAV 基因治疗产品的药学研究内容与评价考虑要点展开讨论。



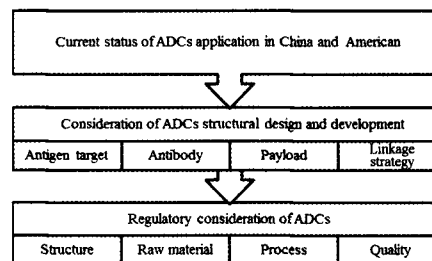
1971

### 抗体偶联药物研发及药学审评要点

张忠兵, 王旻, 白玉\*

(国家药品监督管理局药品审评中心, 北京 100022)

本文介绍了抗体偶联物 (ADCs) 药物的开发和结构设计考虑的主要因素, 以及在此类产品申报时药学技术审评的要点。



## 新药发现与研究实例简析

1978

### 我国创制的抗肿瘤药物泽布替尼

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)



## Professionals Forums

1707

### Examples of biology-driven drug design

GUO Zong-ru\*

(Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)

Taking several examples on marketed drugs or drug candidates in clinical trials, this article tries to concisely illustrate R & D conception of biology-driven drug design.

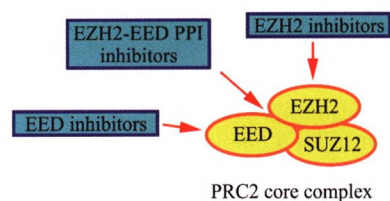
1726

### The development of small-molecule inhibitors that target PRC2-related proteins

GU Jing<sup>1,2</sup>, GUO Xiao-ke<sup>1,2\*</sup>, YOU Qi-dong<sup>1,2\*</sup>

(1. Jiangsu Key Laboratory of Drug Design and Optimization, China Pharmaceutical University, Nanjing 211198, China; 2. School of Pharmacy, China Pharmaceutical University, Nanjing 211198, China)

In this paper, we briefly introduced the biological functions of PRC2 complex and reviewed the research progress of small molecule inhibitors of PRC2 related proteins.



## Reviews

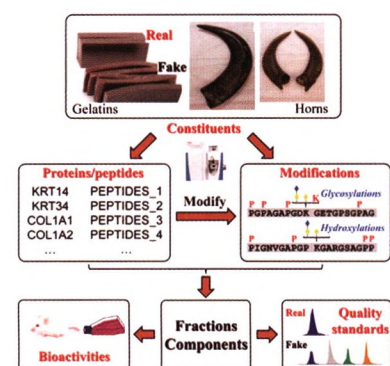
1735

### Ideas and strategies for investigating the bioactive constituents of animal derived traditional Chinese medicines based on integrated "proteomics/peptidomics-modifications" methods

LIU Rui<sup>1,2,3</sup>, ZHAO Ming<sup>1,3</sup>, DUAN Jin-ao<sup>1,3\*</sup>

(1. National and Local Collaborative Engineering Center of Chinese Medicinal Resources Industrialization and Formulae Innovative Medicine and Jiangsu Collaborative Innovation Center of Chinese Medicinal Resources Industrialization, Nanjing University of Chinese Medicine, Nanjing 210023, China; 2. Jiangsu Key Laboratory of Research and Development in Marine Bio-resource Pharmaceutics, Nanjing University of Chinese Medicine, Nanjing 210023, China; 3. School of Pharmacy, Nanjing University of Chinese Medicine, Nanjing 210023, China)

To reveal the correlations between proteins/peptides and their bioactivities in animal derived traditional Chinese medicines (ATCMs), we based on integrated "proteomics/peptidomics-modifications" methods, promote applications and investigations on ATCMs modernization.



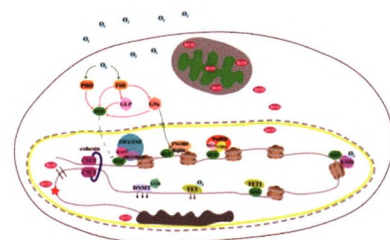
1744

### Oxygen impact on genome structure and chemistry

HOU Chun-ying, LU Duo\*

(The 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)

This work summarized the oxygen effects on genome in respect of reactive oxygen species, ferrous ions and hypoxia, and briefly discussed the related drug molecules.

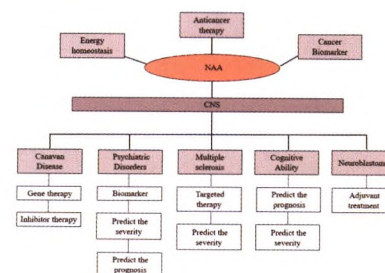


1754

**Progress in research of *N*-acetylaspartate in central nervous system**

CAO Lin-yu, DING Hong-wan, YAO Kai-yun, ZHANG Jian-jun, WANG Gui-bin\*  
*(Beijing Key Laboratory of New Drug Mechanisms and Pharmacological Evaluation Study, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)*

*N*-Acetylaspartate (NAA) has the prospect of prediction and diagnosis for diseases, and targeted therapy may become the breakthrough of refractory diseases.



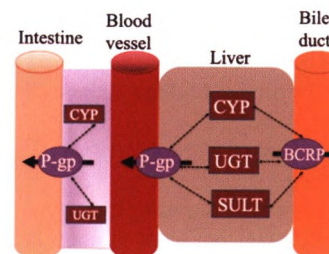
1762

**Effect of cooperation between transporters and metabolic enzymes on drug disposition by intestine and liver**

ZHOU Yan<sup>1,2</sup>, WU Xin-an<sup>2</sup>, DENG Yi<sup>1,3\*</sup>

*(1. College of Pharmacy, Gansu College of Traditional Chinese Medicine, Lanzhou 730000, China; 2. Department of Pharmacy, the 1st Hospital of Lanzhou University, Lanzhou 730000, China; 3. Key Laboratory of Chemistry and Quality for Traditional Chinese Medicine of Gansu Province, Lanzhou 730000, China)*

Cooperation between drug transporters and metabolic enzymes in intestine or liver.



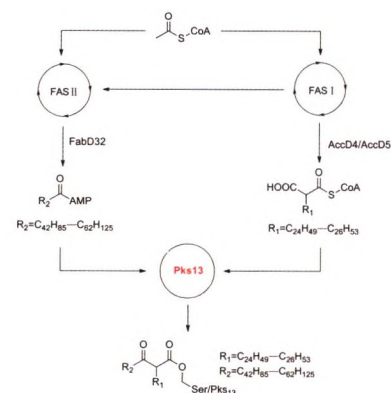
1768

**Research advances in *M. Tuberculosis* polyketide synthase 13 inhibitors**

DING Wei, ZHAO Wen-ting, ZHANG Dong-feng\*

*(Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing Key Laboratory of Active Substance Discovery and Druggability Evaluation, Chinese Academy of Medical Sciences Key Laboratory of Anti-DR TB Innovative Drug Research, Beijing 100050, China)*

Polyketide synthase 13 (Pks13) was a promising drug target in *Mycobacterium tuberculosis*. Herein, we summarized recent advances in the study of Pks13 inhibitors.



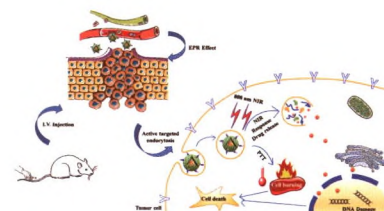
1774

**Research progress of photothermal therapy combined with chemotherapy based on nano co-delivery strategy**

XU Hai-ting, WU Yi-han, SHI Jin-feng, LI Jia-xin, ZHANG Jin-ming\*,  
 FU Chao-mei\*

*(School of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China)*

Co-delivering photothermal agents and chemotherapy drugs with nanocarriers can achieve synergistic anti-tumor effects, providing a reference for the further development of multi-mode tumor combination therapy.



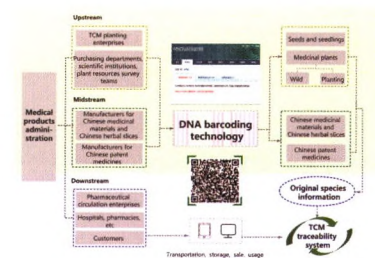
1784

**Application of DNA barcoding technology in the whole industrial chain of traditional Chinese medicine**

LOU Qian<sup>1,2</sup>, XIN Tian-yi<sup>1</sup>, SONG Jing-yuan<sup>1,3\*</sup>

*(1. Key Lab of Chinese Medicine Resources Conservation, State Administration of Traditional Chinese Medicine of the People's Republic of China, Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100193, China; 2. Beijing University of Chinese Medicine, Beijing 102488, China; 3. Engineering Research Center of Chinese Medicine Resource, Ministry of Education, Beijing 100193, China)*

This paper reviews the application of DNA barcoding technology in the whole industrial chain of traditional Chinese medicine (TCM), including the planting, production, circulation and utilization of TCM.



## Original Articles

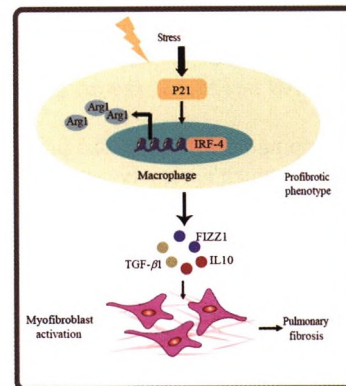
1792

### The cell cycle inhibitor p21 promote mouse lung fibrosis by activating alveolar macrophages

WEI Xu-peng<sup>1</sup>, WANG Wan-yu<sup>2</sup>, LI Yun-xuan<sup>2</sup>, LIU Chang<sup>2</sup>, LÜ Xiao-xi<sup>2</sup>, ZHAO Yan-yan<sup>1\*</sup>, LIU Shan-shan<sup>2\*</sup>

(1. Pharmacy College, Hebei University, Baoding 071000, China; 2. 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)

This study reported that repetitive bleomycin injury induces the expression of the cell cycle inhibitor p21, which promotes mouse lung fibrosis by activating alveolar macrophages.



1801

### Study on the therapeutic effects and mechanism of cryptotanshinone on mice with chemotherapy-induced mucositis

WANG Lin<sup>1</sup>, WANG Rui<sup>2</sup>, WEI Guang-yi<sup>2</sup>, WANG Shu-mei<sup>2</sup>, DU Guan-hua<sup>1\*</sup>

(1. Beijing Key Laboratory of Drug Target and Screening Research, Institute of Materia Medica, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China; 2. Guangdong Pharmaceutical University, Guangzhou 510006, China)

Cryptotanshinone may effectively improve chemotherapeutic intestinal mucositis in mice by regulating fecal flora and lipid metabolism and inhibiting the expression of inflammatory factors.



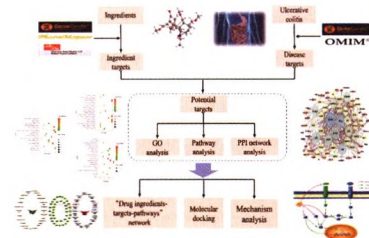
1812

### The mechanism of action of Fuzi-Lizhong pill in treatment of ulcerative colitis based on network pharmacology-molecular docking

HUANG You, YANG Sha-sha, LIN Xia, ZHAO Sheng-jia, WEI Xin-yi, FU Chao-mei\*, ZHANG Zhen\*

(State Key Laboratory of Characteristic Chinese Medicine Resources in Southwest China, School of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China)

In this paper, the key targets and mechanisms of Fuzi-Lizhong pill in the treatment of ulcerative colitis were predicted by network pharmacology and bioinformatics technology.



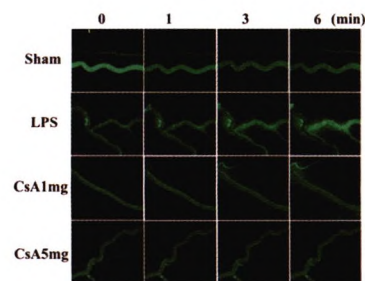
1823

### The protective effects of cyclosporin A on vascular permeability in sepsis rats

WU Yue, ZHU Yu, ZHANG Jie, TIAN Kun-lun, PENG Xiao-yong, XIANG Xin-ming, LIU Liang-ming, LI Tao\*

(State Key Laboratory of Trauma, Burns and Combined Injury, Second Department, Daping Hospital, Army Medical University, Chongqing 400042, China)

Cyclosporin A (CsA) can protect mitochondrial function by inhibiting mitochondrial permeability transition pore (MPTP) opening and plays a protective role in the vascular permeability of sepsis rats.



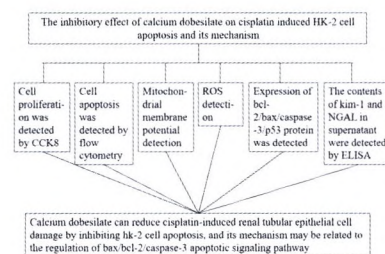
1830

### The inhibitory effect of calcium dobesilate on cisplatin induced HK-2 cell apoptosis and its mechanism

REN Chun-xia, ZHU Li-fei, YU Zi-cheng\*

(Department of Pharmacy, Yangpu Hospital, Tongji University, Shanghai 200090, China)

The effect of calcium dobesilate on renal tubular epithelial cell injury induced by cisplatin and its mechanism were discussed for the first time.

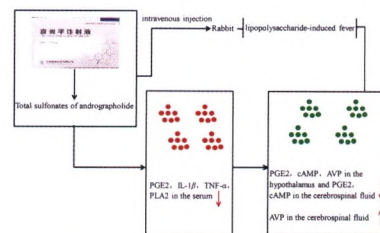


1836

**Antipyretic effect of Xiyanping injection on bacterial endotoxin lipopolysaccharide-induced fever in rabbits**

ZHENG Chen<sup>1</sup>, JIANG Chun-hong<sup>2</sup>, ZENG Jun-nan<sup>2</sup>, DAI Yue<sup>1</sup>, WEI Zhi-feng<sup>1\*</sup>  
 (1. School of Traditional Chinese Pharmacy, China Pharmaceutical University, Nanjing 210000, China; 2. State Key Laboratory of Innovative Natural Medicine and TCM Injections, Jiangxi Qingfeng Pharmaceutical, Ganzhou 341000, China)

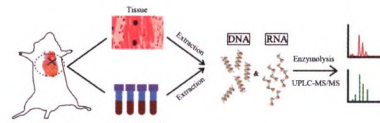
Xiyanping injection could significantly improve the endotoxin-induced fever in rabbits, which is closely related to the levels of PGE2, TNF- $\alpha$ , IL-1 $\beta$ , PLA2, cAMP, and AVP.



1841

**Determination of genome-wide DNA and total RNA methylation in rats with myocardial infarction by mass spectrometry**

CHANG Ji-shuo<sup>1,2</sup>, LIN Zhong-xiao<sup>1</sup>, ZHANG Yan-fen<sup>1</sup>, HU Yuan<sup>1</sup>, YU Xi-yong<sup>1,2\*</sup>  
 (1. Key Laboratory of Molecular Clinical Pharmacology, School of Pharmaceutical Sciences, Guangzhou Medical University, Guangzhou 511436, China; 2. GMU Medical Drug Development Co., Ltd., Guangzhou 511436, China)



After extraction and enzymolysis of the infarct marginal tissue and peripheral blood lymphocytes before and after myocardial infarction in rats, the methylation level of genomic DNA and total RNA in each group was detected by liquid chromatography tandem mass spectrometry, and found that the methylation rate increased and showed synchronization.

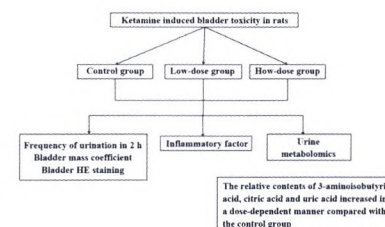
1849

**Metabolic abnormalities associated with ketamine-associated bladder toxicity based on metabolomics**

WU Zhi-gui<sup>1</sup>, YIN Wen-xian<sup>2</sup>, LUO Hong-li<sup>1</sup>, SI Yuan-kai<sup>1</sup>, SUN Meng-qi<sup>1</sup>, LIAO Lin-chuan<sup>3\*</sup>

(1. Department of Pharmacy, Affiliated Hospital of Southwest Medical University, Luzhou 646000, China; 2. Department of Pharmacy, Hospital of Traditional Chinese Medicine Affiliated to Southwest Medical University, Luzhou 646000, China; 3. West China School of Basic Medical Sciences and Forensic Medicine, Sichuan University, Chengdu 610041, China)

Cytotoxicity induced by ketamine may be closely related to the three metabolites of 3-amino-isobutyric acid, citric acid and uric acid and their related metabolic pathways.



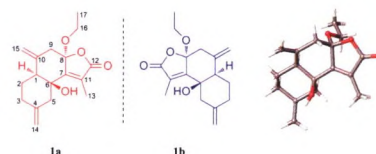
1855

**A pair of enantiomeric sesquiterpenoids with neuroprotective effects from *Chloranthus henryi***

CHEN Fang-you, LI Hong-tao, CHEN Jie, SHUANG Peng-cheng, LUO Yong-ming\*

(School of Pharmacy, Jiangxi University of Traditional Chinese Medicine, Nanchang 330004, China)

A pair of enantiomeric sesquiterpenoids with neuroprotective effects were obtained from *Chloranthus henryi*.



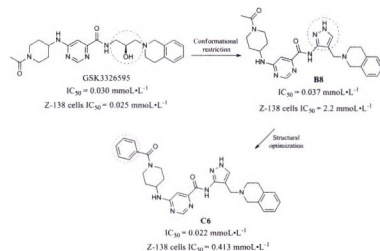
1859

**Design, synthesis and activity evaluation of protein arginine methyltransferase 5 inhibitor**

ZHU Kang-le<sup>1,2</sup>, WANG Ya-zhou<sup>2\*</sup>, YOU Qi-dong<sup>1\*</sup>

(1. Jiangsu Key Laboratory of Drug Design and Optimization, China Pharmaceutical University, Nanjing 210009, China; 2. Nanjing Sanhome Pharmaceutical Co., Ltd. Nanjing 210000, China)

A series of new compounds were designed using GSK3326595 as a lead compound by using the conformational restriction approach. Through biological evaluation, it was found that compounds **B8** and C series of derivatives displayed comparable enzymatic inhibitory activity to that of GSK3326595.

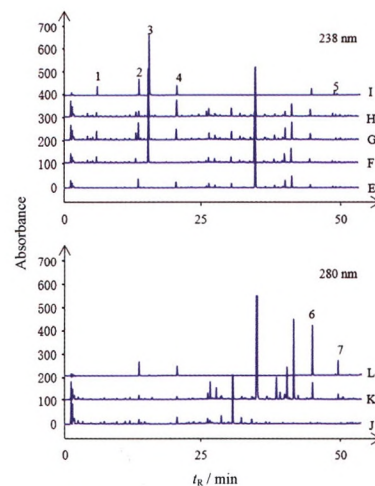


1872

### Simultaneous determination of multiple constituents of QingJinHuaTan Decoction by ultra high performance liquid chromatography

LIU Jing, LIU Ran, LI Dan-dan, XU Hua-rong, LI Qing, BI Kai-shun\*  
(Shenyang Pharmaceutical University, Shenyang 110016, China)

A UHPLC-DAD method for simultaneous determination of 7 contents including gardenoside B, neomangiferin, geniposide, mangiferin, baicalein, wogonin glycyrrhizin in QingJinHuaTan Decoction as quality control was established.



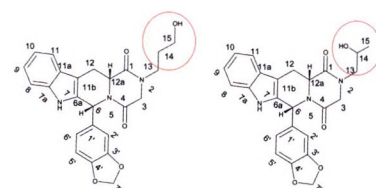
1877

### Discovery and identification of a tadalafil analogue

FENG Ting-ting<sup>1,2,3</sup>, SUN Jian<sup>2</sup>, ZHANG Jing-xian<sup>2</sup>, YU Hong<sup>2</sup>, FENG Rui<sup>2</sup>, ZHANG Su<sup>2</sup>, MAO Xiu-hong<sup>2</sup>, HU Qing<sup>2\*</sup>, JI Shen<sup>1,2\*</sup>

(1. China State Institute of Pharmaceutical Industry, Shanghai 201203, China;  
2. Shanghai Institute for Food and Drug Control, NMPA Key Laboratory for Quality Control of Traditional Chinese Medicine, Shanghai 201203, China;  
3. Hebei North University, Zhangjiakou 075000, China)

A new tadalafil analogue was detected during routine screenings from two dietary supplements by using UHPLC/Q-TOF HRMS.



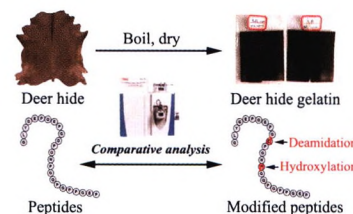
3-Hydroxypropylnoertadalafil 2-Hydroxypropylnoertadalafil

1882

### Comparative analysis of chemical constituents of deer hide and deer hide gelatin by “peptidomics-modifications” methods

LIU Rui<sup>1,2,3</sup>, ZHU Yue<sup>1,3</sup>, ZHENG Yun-feng<sup>1,3</sup>, ZHAO Ming<sup>1,3</sup>, LIU Xun<sup>4</sup>, HUANG Yong<sup>5</sup>, XU Hao-kun<sup>5</sup>, DUAN Jin-ao<sup>1,3\*</sup>

(1. National and Local Collaborative Engineering Center of Chinese Medicinal Resources Industrialization and Formulae Innovative Medicine and Jiangsu Collaborative Innovation Center of Chinese Medicinal Resources Industrialization, Nanjing 210023, China; 2. Jiangsu Key Laboratory of Research and Development in Marine Bio-resource Pharmaceuticals, Nanjing University of Chinese Medicine, Nanjing 210023, China; 3. School of Pharmacy, Nanjing University of Chinese Medicine, Nanjing 210023, China; 4. Suzhou Vocational Health College, Suzhou 215009, China; 5. Guizhou Guangjitang Pharmaceutical Co., Ltd., Guiyang 550014, China)



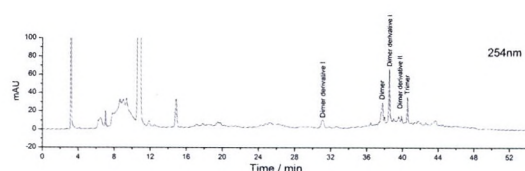
Comparative analysis on changes and patterns of main types of modifications between deer hide and deer hide gelatin based on “Peptidomics-Modifications” strategy.

1889

### Analysis of polymer impurities in ceftazidime raw materials and preparations

LI Jin, YAO Shang-chen, YIN Li-hui, XU Ming-zhe\*, HU Chang-qin  
(National Institutes for Food and Drug Control, Beijing 102629, China)

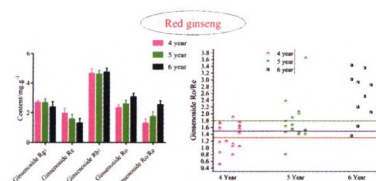
Four polymer impurities including ceftazidime dimers and its derivatives and trimers can be detected by RP-HPLC with good specificity, sensitivity and robustness. Therefore, the method is suitable for the quality control of polymer impurities in ceftazidime.



1897

**Quality control of red ginseng based on the ratio of ginsenosides Ro/Re**YANG Yuan-gui<sup>1</sup>, YANG Ying-bo<sup>1,3</sup>, JU Zheng-cai<sup>1</sup>, Zhang Yan-hai<sup>1</sup>, YANG Li<sup>1,2\*</sup>, WANG Zheng-tao<sup>1,2\*</sup>

(1. The MOE Key Laboratory of Standardization of Chinese Medicines and the SATCM Key Laboratory for New Resources and Quality Evaluation of Chinese Medicines, Institute of Chinese Materia Medica, Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China; 2. Shanghai R&D Center for Standardization of Chinese Medicines, Shanghai 201203, China; 3. Kanion Pharmaceutical Co., Ltd., Lianyungang 222001, China)



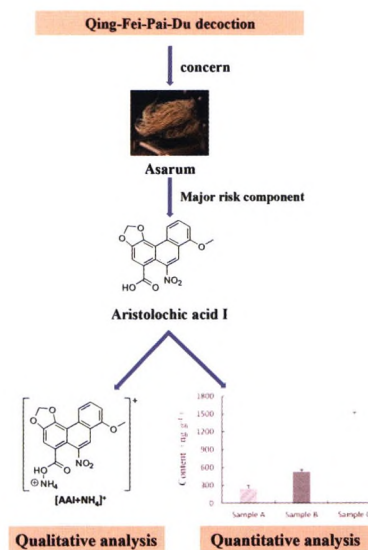
An HPLC analysis method for ginsenosides Rg<sub>1</sub>, Re, Rb<sub>1</sub> and Ro were established by a C18 core-shell column technology. The ratio of ginsenoside Ro and Re were used to discriminate red ginseng of different growing years.

1903

**Monitoring and quantitative analysis of trace aristolochic acid I in a Qing-Fei-Pai-Du decoction using liquid chromatography-mass spectrometry**CHEN Yi-jun<sup>1,2</sup>, WANG Wei<sup>2\*</sup>, XIAO Hong-bin<sup>1,2\*</sup>

(1. Research Center of Chinese Medicine Analysis and Transformation, Beijing University of Chinese Medicine, Beijing 100029, China; 2. Beijing Key Laboratory of Syndrome Prescription Basic Research, Beijing University of Chinese Medicine, Beijing 100029, China)

The UHPLC-Q TOF-MS/MS and UHPLC-QQQ-MS/MS methods were sequentially established to qualitatively and quantitatively detect the existence and the content of aristolochic acid I (AAI), a potential toxic compound, in asarum, which was overused in Qing-Fei-Pai-Du decoction (QFPD). And on this basis, the accurate content of AAI in QFPD, reflux extract of asarum and ultrasonic extract of 70% methanol of asarum were then separately determined and compared, so as to provide rational application evidence of asarum in QFPD.

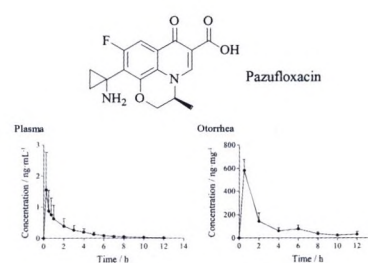


1908

**LC-MS/MS analysis of pazufloxacin in human plasma and otorrhea: application to a pharmacokinetic study of ear drops**SHEN Si-qi<sup>1,2</sup>, LI Ran-ran<sup>2</sup>, MA Yuan-yuan<sup>2</sup>, LIN Hai-xia<sup>1</sup>, CHEN Xiao-yan<sup>1,2\*</sup>

(1. College of Sciences, Shanghai University, Shanghai 200444, China; 2. Shanghai Institute of Materia Medica, Chinese Academy of Sciences, Shanghai 201203, China)

Pazufloxacin ear drops were a quinolone topical agent. A simple and highly sensitive LC-MS/MS method was established to determine pazufloxacin in plasma and otorrhea, which was successfully applied to the systemic and topical pharmacokinetic studies after a single-dose instillation of pazufloxacin ear drops to patients with chronic suppurative otitis media.

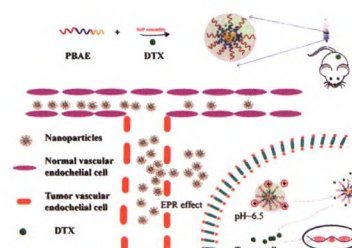


1914

**pH responsive docetaxel micelles with improved therapeutic efficacy on mice xenograft tumor**HAO Dan-li<sup>#</sup>, WANG Jie<sup>#</sup>, XIE Ran, YUE Qiao-xin, YI Hong, ZANG Chen, ZHAO Qing-he<sup>\*</sup>, CHEN Yan-jun<sup>\*</sup>

(Institute of Chinese Materia Medica, China Academy of Chinese Medical Sciences, Beijing 100700, China)

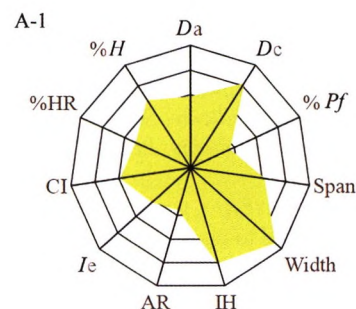
The pH responsive docetaxel (DTX) polymer micelles (PBAE-DTX) could preferentially permeate through the blood vessels to tumor tissues due to the enhanced permeability and retention (EPR) effect, afterward the polymer micelles would be internalized into tumor cells and release docetaxel rapidly within the acidic tumor organelles.



1923

**Quality consistency evaluation and intelligent visualization of performance parameters of carboxymethylcellulose sodium**

ZHANG Xiao-na<sup>1,2#</sup>, SUN Hui-min<sup>2#\*</sup>, WANG Jue<sup>2</sup>, YANG Rui<sup>2</sup>, ZHANG Xue-mei<sup>3</sup>, LIU Wan-hui<sup>3</sup>, DING Jia-xin<sup>3</sup>, DAI Chuan-yun<sup>4\*</sup>, SUN Kao-xiang<sup>1,3\*</sup>  
 (1. Key Laboratory of Molecular Pharmacology and Drug Evaluation (Yantai University), Ministry of Education, Collaborative Innovation Center of Advanced Drug Delivery System and Biotech Drugs in Universities of Shandong, Yantai University, Yantai 264005, China; 2. NMPA Key Laboratory for Quality Research and Evaluation of Pharmaceutical Excipients, National Institutes for Food and Drug Control, Beijing 100050, China; 3. State Key Laboratory of Long-Acting and Targeting Drug Delivery System, Shandong Luye Pharmaceutical Co., Ltd., Yantai 264003, China; 4. Institute of Biotechnology and Pharmaceutical Engineering Technology, Chongqing University of Science and Technology, Chongqing 401331, China)

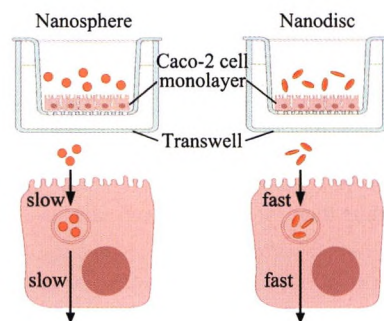


In this study, physical fingerprint was applied to characterize the quality consistency of different sources of carboxymethylcellulose sodium.

1932

**The effect of the shape of nanocarriers on their transmembrane across Caco-2 cell monolayer**

ZHANG Run-yu<sup>1</sup>, SONG Yang<sup>1</sup>, CHEN Qing<sup>1</sup>, DENG Hai-liang<sup>1</sup>, ZHANG Hua<sup>1</sup>, DAI Wen-bing<sup>1</sup>, HE Bing<sup>1</sup>, CHEN Ying<sup>2</sup>, ZHANG Qiang<sup>1</sup>, WANG Xue-qing<sup>1\*</sup>  
 (1. School of Pharmaceutical Sciences, Peking University, Beijing 100191, China; 2. Guangdong Institute for Drug Control, Guangzhou 510700, China)

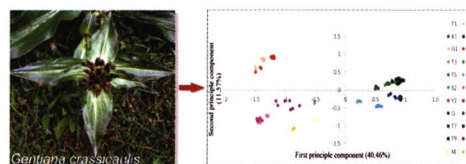


In this study, spherical cerasome and disc-shaped nanodisc were prepared. Nanodisc was endocytosed more quickly by Caco-2 cell and had a higher transmembrane rate than nanosphere on Caco-2 cell monolayer.

1941

**DNA fingerprinting and genetic diversity in a threatened alpine medicinal plant, *Gentiana crassicaulis* (Gentianaceae) using AFLP**

ZONG Fen-fen<sup>1</sup>, ZHAO Zhi-li<sup>1\*</sup>, NI Liang-hong<sup>1</sup>, GAAWE Dorje<sup>2</sup>, LIU Tong-hua<sup>2,3</sup>  
 (1. Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China; 2. Tibetan Traditional Medical College, Lhasa 850000, China; 3. Beijing University of Chinese Medicine, Beijing 100029, China)

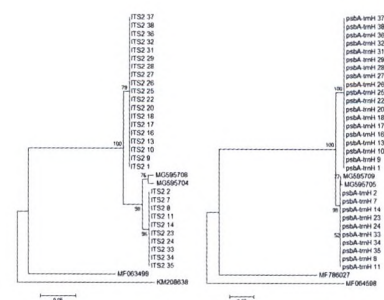


AFLP fingerprinting for the analysis of genetic diversity within an alpine medicinal plant, *Gentiana crassicaulis* (Gentianaceae).

1951

**Use of ITS2 and *psbA-trnH* DNA barcode sequences of wild *Phytolacca* resources in Guanzhong area of Shaanxi Province**

LÜ Rui-hua<sup>1</sup>, FENG Zhao<sup>1</sup>, MA Tian-yi<sup>1</sup>, LÜ Rui-hua<sup>1</sup>, ZHANG Ming-ying<sup>2</sup>, PENG Liang<sup>2</sup>, GAO Jing<sup>2</sup>, ZHANG Gang<sup>2\*</sup>  
 (1. College of Medical Technology, Shaanxi University of Chinese Medicine, Xianyang 712046, China; 2. College of Pharmacy and Shaanxi Qinling Application Development and Engineering Center of Chinese Herbal Medicine, Shaanxi University of Chinese Medicine, Xianyang 712046, China)



ITS2 and *psbA-trnH* could be used for identification of *Phytolacca* and the adulterants. The analyses showed that the wild resources of *Phytolacca* species in Guanzhong area of Shaanxi Province were mainly *P. acinosa* and *P. americana*.

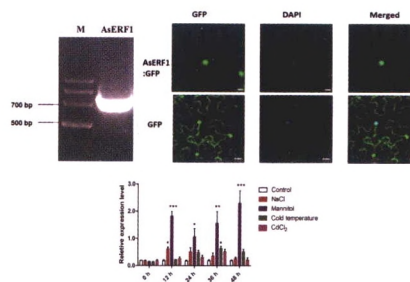
1957

**Gene cloning, subcellular localization and expression analysis of the *AsERF1* gene from *Aquilaria sinensis***

LI Tie-zheng<sup>1#</sup>, ZHENG Yi-zhe<sup>1#</sup>, RONG Yu-qing<sup>1</sup>, WEI Sheng-li<sup>2</sup>,  
WANG Xiao-hui<sup>1,2\*</sup>, TU Peng-fei<sup>1\*</sup>

(1. Modern Research Center for Traditional Chinese Medicine, School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing 100029, China; 2. Department of Resources and Identification of Traditional Chinese Medicine, School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing 100029, China)

A new *AsERF1* gene was isolated from *Aquilaria sinensis*. *AsERF1* mainly localized to nuclear, and *AsERF1* expression level was induced by salt, drought, low temperature and CdCl<sub>2</sub> treatments.



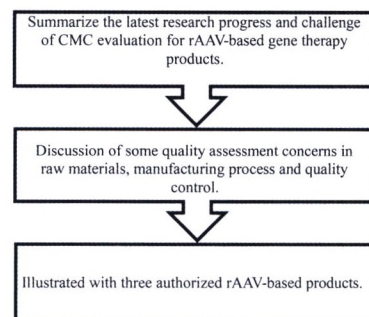
**New Drug Forum**

1965

**Chemistry, manufacturing and control considerations of rAAV-based gene therapy products**

LIU Bo-ning, XU Long-chang, HAN Dong-mei, LUO Jian-hui\*  
(Center for Drug Evaluation, National Medical Products Administration, Beijing 100022, China)

With the study of approved recombinant adeno-associated virus (rAAV) products, the pharmaceutical research progress and CMC considerations for rAAV-based gene therapy products were discussed.

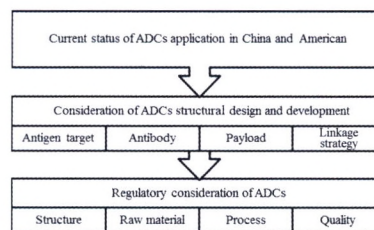


1971

**Consideration of antibody drug conjugates development and regulation**

ZHANG Zhong-bing, WANG Yang, BAI Yu\*  
(Center for Drug Evaluation, National Medical Products Administration, Beijing 100022, China)

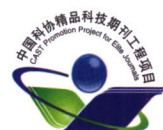
This article summarizes the main elements in structural design and development of antibody drug conjugates (ADCs), as well as the regulatory consideration of manufacture and control of those products.





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