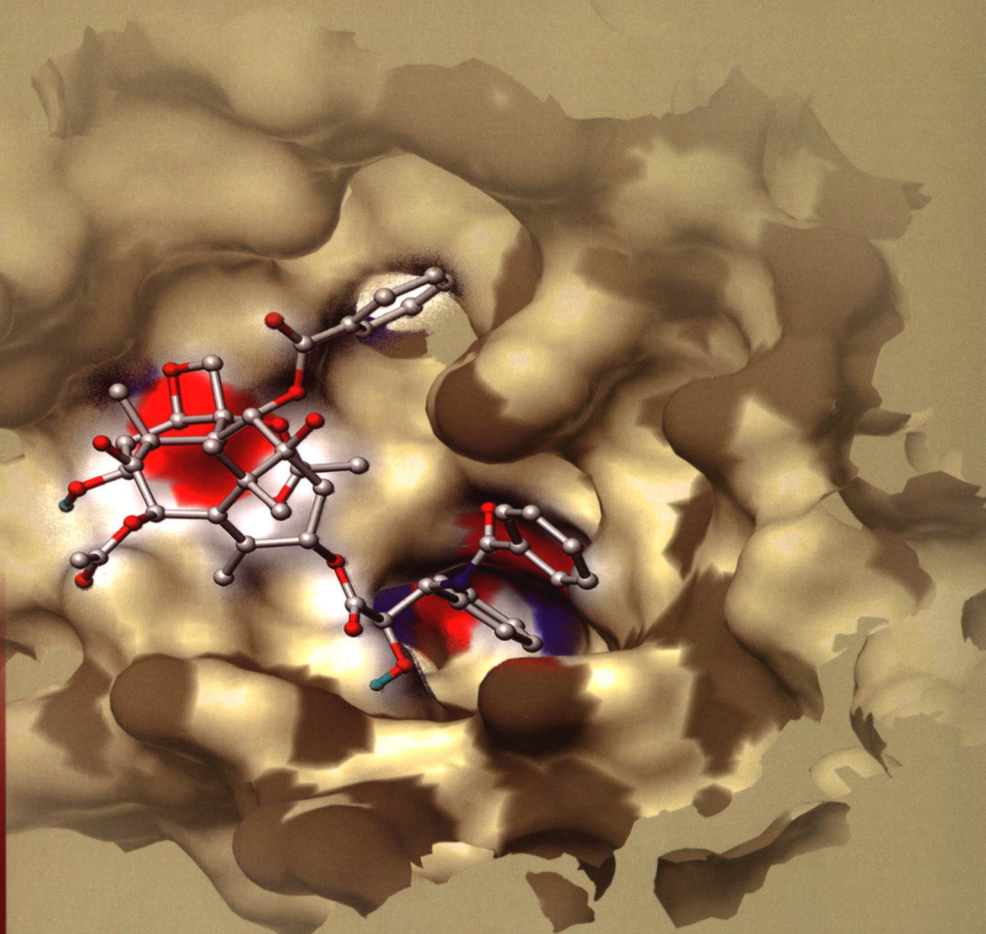


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专题报道I

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整合药物化学——药物发现中的
新范式
万方数据

专题报道II

范斯文, 朱彦等
3D类器官心脏肥大模型的建立及在心血
管病治疗中药作用机制解析中的应用



中国药学会
中国医学科学院药物研究所

药 学 学 报

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图 文 摘 要

专题报道 I: 药物发现的新靶标、新策略与抗病毒药物研究

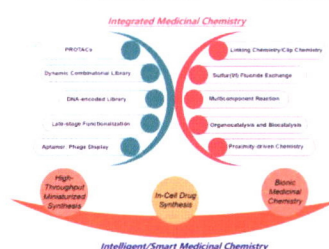
2889

整合药物化学——药物发现中的新范式

徐淑静[#], 丁当[#], 刘新泳^{*}, 展鹏^{*}

(山东大学药学院药物化学研究所, 化学生物学教育部重点实验室, 山东 济南 250012)

本综述总结了药物化学中新技术、通过整合创新形成的新研究领域以及新颖且实用的“化学工具箱”。



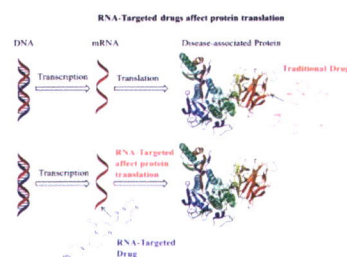
2902

以 RNA 为靶标的小分子药物的研究进展

杜晓利, 陈慧慧, 叶向阳^{*}, 谢恬^{*}, 何兴瑞^{*}

(杭州师范大学药学院, 浙江省榄香烯类抗癌中药重点实验室, 浙产中药材资源开发与应用浙江省工程实验室, 浙江省浙八味等浙产中药材综合利用开发 2011 协同创新中心, 浙江 杭州 311121)

靶向 RNA 的小分子药物通过影响 mRNA 的翻译过程实现对疾病的治疗。



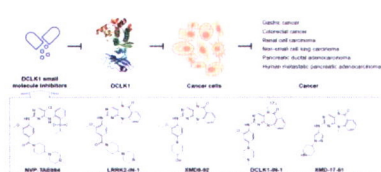
2914

双肾上腺皮质激素样激酶 1 小分子抑制剂的研究进展

陈玉平[#], 李柯良[#], 盛春泉^{*}, 武善超^{*}

(中国人民解放军海军军医大学, 上海 200433)

本文综述了 DCLK1 小分子抑制剂的发现、结构类型、结构优化、生物活性及作用机制等方面的研究进展, 以为开发基于 DCLK1 的新型抗肿瘤小分子抑制剂提供借鉴和参考。



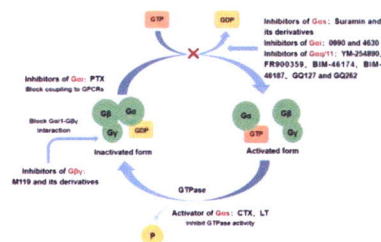
2921

G 蛋白调节剂的研究进展

杨一帆[#], 胡卓睿[#], 刘鹤, 李一贤, 刘璐, 熊小峰^{*}

(中山大学药学院, 广东 广州 510006)

本文综述 G 蛋白与疾病的关系, 并且总结目前已发现的 G 蛋白抑制剂。



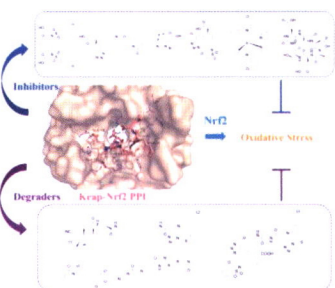
2932

Keap1-Nrf2 蛋白相互作用小分子抑制剂及降解剂研究进展

闫健羽, 刘国栋, 缪震元, 庄春林^{*}

(中国人民解放军海军军医大学药学院, 上海 200433)

本文以结构类型分类, 对分子的结构、活性及构效关系进行总结, 综述了近年来 Keap1-Nrf2 蛋白相互作用抑制剂和基于 Keap1 E3 泛素化系统的降解剂的研究进展。



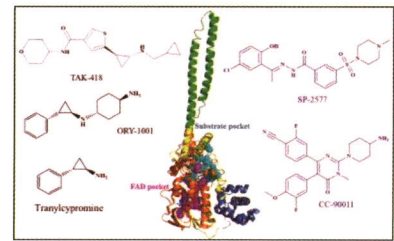
2949

组蛋白去甲基化酶 LSD1 抑制剂临床研究进展

史宇婷, 杨欣语, 余斌*, 宋宜辉*

(郑州大学药学院, 河南 郑州 450001)

靶向赖氨酸特异性去甲基化酶 1 (LSD1) 的不可逆抑制剂 *translucypramine*、ORY-1001、ORY-2001、GSK-2879552、IMG-7289、INCB059872、TAK-418、LH-1802 及可逆抑制剂 CC-90011 和 SP-2577 先后获批开展单用或联用的临床研究, 具有较好的临床应用潜力同时也面临着毒副作用等挑战。



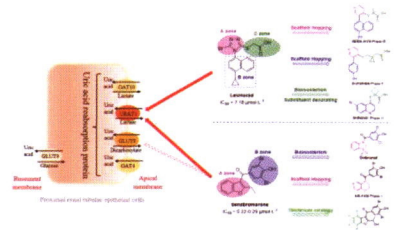
2960

URAT1 抑制剂研究进展及药物化学策略

史晓雨, 赵彤, 章健, 梁瑞鹏, 张志姣, 刘新泳*, 展鹏*

(山东大学药学院药物化学研究所, 化学生物学教育部重点实验室, 山东 济南 250012)

本文综述了具有降尿酸或抗痛风药理作用的 URAT1 抑制剂及其药物化学策略, 以期为新型抗痛风及高尿酸血症药物的研发提供参考。

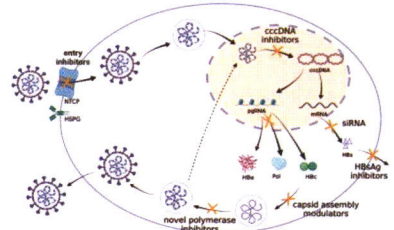


2972

直接抗乙肝病毒候选药物的临床试验研究进展王美¹, 刘林月¹, 李传举¹, 刘俊^{2*}, 贾海水^{1*}

(1. 潍坊医学院药学院, 山东 潍坊 261053; 2. 潍坊医学院护理学院, 山东 潍坊 261053)

目前, 已出现了多种可以靶向 HBV 生命周期不同阶段的新型候选药物, 包括侵入抑制剂、衣壳抑制剂、RNA 干扰类药物、cccDNA 抑制剂、HBsAg 抑制剂、聚合酶抑制剂。本文回顾了慢性乙肝的治疗现状, 以及上述新型候选药物的临床试验研究进展。



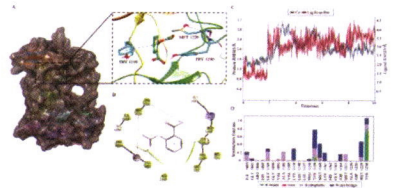
2985

阿司匹林抑制 HGF/c-Met 介导的肿瘤细胞转移作用

代晓阳*, 陈思康, 车金鑫

(浙江大学药学院, 浙江 杭州 310058)

本研究证明了 c-Met 是阿司匹林的潜在作用靶点, 阿司匹林可通过与 c-Met 结合, 从而抑制 HGF/c-Met 信号轴的活化, 进而发挥抑制肿瘤转移与侵袭的作用。本研究为理解阿司匹林抑制肿瘤转移提供了新的视角与佐证, 也为 c-Met 小分子抑制剂的开发提供了新的策略。



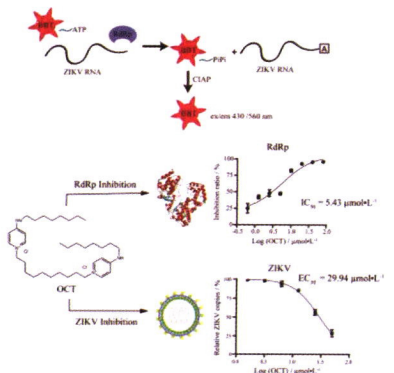
2995

寨卡病毒 RdRp 抑制剂的筛选及活性研究

张红娟#, 陈莹#, 韩燕星, 林媛*, 蒋建东*

(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)

本文基于碱性磷酸酶偶联聚合酶荧光检测法建立了寨卡病毒 (ZIKV) RNA 依赖的 RNA 聚合酶 (RdRp) 抑制剂筛选模型, 对已上市抗感染化合物库进行筛选, 得到的化合物奥替尼啶双盐酸盐 (OCT) 对 RdRp 具有良好的抑制活性。在抗 ZIKV 实验中发现, OCT 对 ZIKV 的复制具有一定的抑制作用。



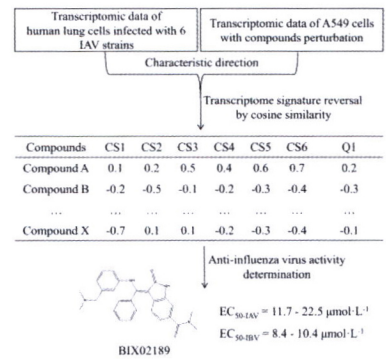
3002

基于转录组特征基因反向匹配方法发现抗流感病毒化合物 BIX02189

吴悠^{1,2#}, 陈姝冰^{1,2#}, 唐克^{1,2}, 郭颖^{1,2*}

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

应用转录组特征基因反向匹配方法, 计算化合物扰动细胞特征基因与流感病毒感染细胞的特征基因间的余弦相似度, 得到化合物列表并活性评价, 最终获得具有抗甲型和乙型流感病毒活性的化合物 BIX02189。



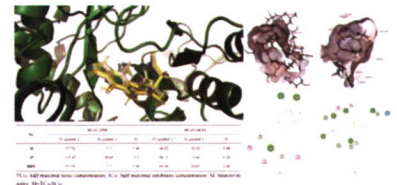
3011

以次黄嘌呤脱氢酶为靶点的抗病毒化合物的虚拟筛选及活性研究

寇世博, 高荣梅, 易红, 孙连奇, 李玉环, 李卓荣*

(中国医学科学院、北京协和医学院, 医药生物技术研究所, 北京 100050)

基于次黄嘌呤脱氢酶 (IMPDH) 蛋白结构, 利用分子对接与 ROC 计算进行虚拟筛选, 并进行抗病毒活性验证, 发现具有抗冠状病毒 HCoV-229E 和 HCoV-OC43 活性的新型先导化合物 12 和 15。



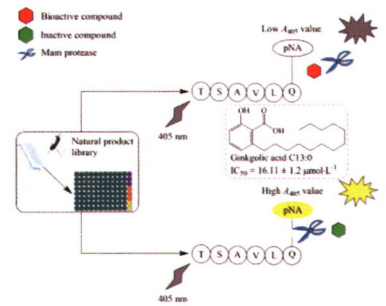
3019

基于比色法原理的新冠病毒主蛋白酶小分子抑制剂高通量筛选模型的优化与应用

闫千千¹, 闫浩浩¹, 刘志成¹, 戚海燕¹, 刘晓丽¹, 刘晓平¹, 张晶^{2*}, 陈云雨^{1*}

(1. 皖南医学院, 药物筛选与评价研究所, 安徽 芜湖 241002; 2. 中国医学科学院、北京协和医学院医药生物技术研究所, 北京 100050)

以新冠病毒主蛋白酶 (main protease, M^{pro}) 为靶标, 优化并建立 M^{pro} 小分子抑制剂比色法高通量筛选模型, 成功筛选到白果新酸对 M^{pro} 酶活性具有良好的竞争性抑制作用。



专题报道 II: 中药防治心脑血管相关疾病

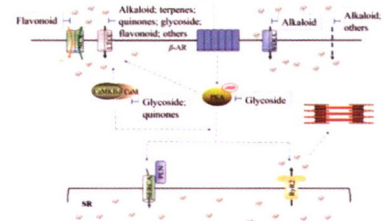
3027

植物源天然钙离子通道拮抗剂在抗心律失常药物开发中的应用研究进展

蒲利华^{1,2}, 贺爽^{1,2}, 周正灿^{1,2}, 朱彦^{1,2*}

(1. 天津中医药大学组分中药国家重点实验室, 天津 301617; 2. 天津国际生物医药联合研究院中药新药研发中心, 天津 300457)

本文综述了植物源天然钙离子通道拮抗剂在抗心律失常药物开发中的应用前景研究进展, 为今后药物开发提供依据。



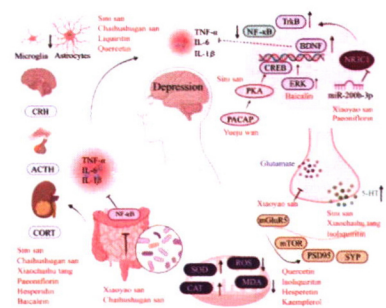
3035

经方及其共有黄酮类成分抗抑郁机制研究进展

郝闻致¹, 王璐¹, 黄俊卿^{1*}, 陈家旭^{1,2*}

(1. 暨南大学, 广州市中医方证重点实验室, 广东 广州 510632; 2. 北京中医药大学中医学院, 北京 100029)

本综述总结了经方及其共有黄酮类成分抗抑郁作用机制。

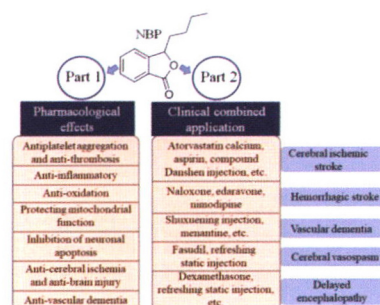


3047

丁基苯酞在脑血管病的药理作用及临床联合应用的研究进展

泥文娟¹, 李伟霞^{2*}, 王晓艳², 吴娅丽², 韩冰¹, 贾金浩¹, 李琨¹, 纪秋如¹, 唐进法^{2*}
(1. 河南中医药大学, 河南 郑州 450046; 2. 河南中医药大学第一附属医院, 河南省中药临床应用、评价与转化工程研究中心, 河南省中药临床药理学中医药重点实验室, 河南郑州 450000)

丁基苯酞 (NBP) 在脑血管病中的药理作用及临床上与其他药物的联合应用。

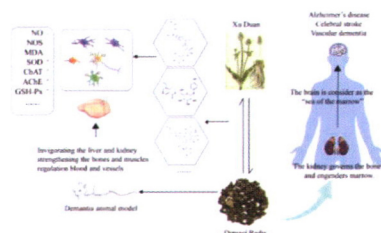


3057

续断及其有效成分的抗痴呆作用及研究进展

崔金帅¹, 刘妍¹, 王子颖^{1*}, 陈刚^{1,2*}
(1. 暨南大学中医学院, 脑病个性化防治跨学科研究所, 广东 广州 510632; 2. 地方病与少数民族疾病教育部重点实验室 (贵州医科大学), 贵州 贵阳 550004)

续断及其有效成分可通过多靶点和分子机制改善痴呆症状。

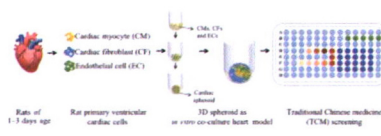


3067

3D 类器官心脏肥大模型的建立及在心血管病治疗中药作用机制解析中的应用

范斯文^{1,2}, 赵玉涵^{1,2}, 肖光旭^{1,2}, 樊官伟^{1,3}, 朱彦^{1,2*}
(1. 天津中医药大学, 省部共建组中药国家重点实验室, 天津 300193; 2. 天津国际生物医药联合研究院, 中药新药研发中心, 天津 300457; 3. 天津中医药大学第一附属医院, 天津中药处方与证学转化研究重点实验室, 天津 300193)

本研究建立了新型体外 3D 心脏类器官模型, 基于该模型评价了类器官的功能及疾病模型指标, 并首次用于评价中药冠心宁注射液 (GXNI) 以揭示其在治疗心血管疾病中的作用。



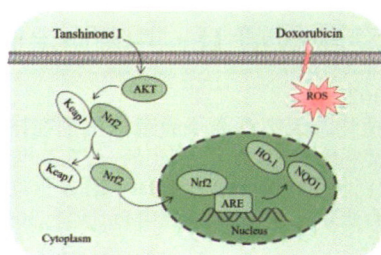
3077

丹参酮 I 基于 Akt-Nrf2 抗氧化通路减轻多柔比星诱导的心脏毒性

姜茜茜^{1,2,3}, 张敬美^{1,2,3}, 薛思明^{1,2,3}, 田雪^{1,2,3}, 陈旭^{2,3,4}, 刘恬恬^{2,3,4}, 江艳艳^{1,2,3}, 孙乾斌^{1,2,3}, 郭冬青^{1,2,3}, 李春^{2,3,5}, 王勇^{2,3,4*}, 王其艳^{1,2,3*}

(1. 北京中医药大学生命科学院, 北京 100029; 2. 证候与方剂基础研究教育部重点实验室 (北京中医药大学), 北京 100029; 3. 证候与方剂基础研究北京市重点实验室, 北京 100029; 4. 北京中医药大学中医学院, 北京 100029; 5. 北京中医药大学中药学院, 现代中药研究中心, 北京 100029)

丹参酮 I 通过调控核因子 E2 相关因子 2 (Nrf2) 通路保护多柔比星诱导的心脏毒性。

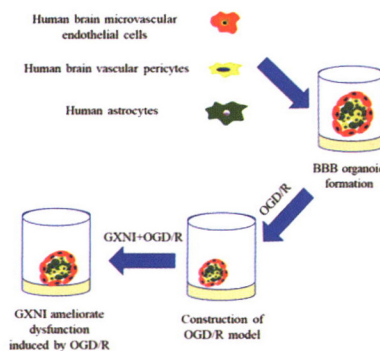


3086

3D 血脑屏障类器官氧糖剥夺模型的构建及冠心宁注射液的保护作用探究

杜宏英^{1,2}, 薛志峰^{1,2}, 夏忠庭^{1,3}, 贺爽^{1,2}, 杨剑^{1,2}, 朱彦^{1,2*}
(1. 天津中医药大学, 组中药国家重点实验室, 天津 301617; 2. 天津国际生物医药联合研究院, 中药新药研发中心, 天津 300457; 3. 盈科瑞 (天津) 创新医药研究有限公司, 天津 300385)

本研究构建了基于类器官形成的氧糖剥夺/复氧 (OGD/R) 模型, 并进行了冠心宁注射液 (GXNI) 对 OGD/R 诱导血脑屏障类器官损伤的保护作用研究。

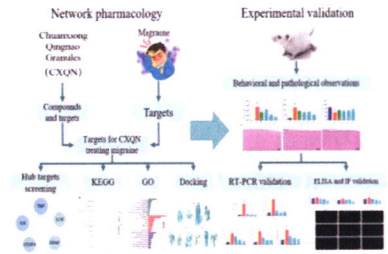


3095

基于网络药理学探讨川芎清脑颗粒改善偏头痛作用机制及验证研究

侯静怡¹, 倪理琪¹, 田良良², 徐核², 曹光昭², 王坤¹, 侯博文¹, 张晶晶^{2*}, 杨洪军^{1*}
 (1. 中国中医科学院医学实验中心, 中医药防治重大疾病基础研究北京市重点实验室, 北京 100700; 2. 中国中医科学院中药研究所, 北京 100700)

本研究基于网络药理学与实验验证相结合, 初步揭示川芎清脑颗粒 (CXQN) 通过调节 TNF- α 、IL-6、VEGFA、IL-1 β 、BDNF 的表达及相关通路降低炎症因子的释放, 调控血管通透性及中枢敏化对偏头痛模型产生保护作用。



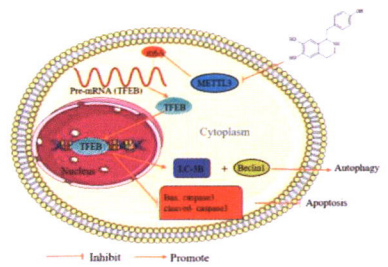
3106

去甲乌药碱调控 METTL3/TFEB 通路抗异丙肾上腺素诱导大鼠心肌梗死

谢保平^{1,2}, 郭奕鑫³, 叶曼仪¹, 黄旭灿³, 李旭平¹, 钟沛成¹, 王大伟⁴, 刘中秋^{1,4*}, 程媛媛^{1,4*}

(1. 广州中医药大学中药学院, 广东 广州 511400; 2. 赣南医学院心脑血管疾病防治教育部重点实验室, 江西 赣州 341000; 3. 广州中医药大学基础医学院, 广东 广州 511400; 4. 广州中医药大学顺德医院, 广东 佛山 528333)

去甲乌药碱可抑制心肌细胞凋亡, 改善心肌梗死, 其机制可能与调控甲基转化酶样 3 (methyltransferase-like 3, METTL3)/转录因子 EB (transcription factor EB, TFEB) 信号通路介导心肌细胞自噬有关。



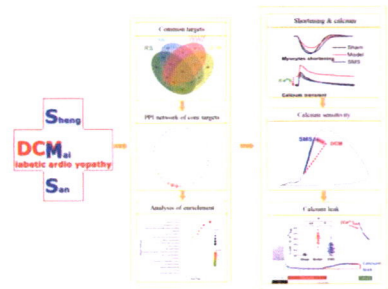
3115

基于网络药理学探讨生脉散降低钙泄漏保护糖尿病大鼠心肌收缩功能的机制研究

黄聪¹, 孙明杰¹, 崔海峰¹, 孙丽华¹, 武乾¹, 翟取², 石晓路^{1*}

(1. 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; 2. 国家药品监督管理局高级研修学院, 北京 100073)

生脉散可能通过钙信号通路, 下调雷诺丁受体 2 (ryanodine receptor 2, RyR2) 磷酸化水平, 减少钙泄漏, 从而保护糖尿病大鼠心肌收缩功能。



综述

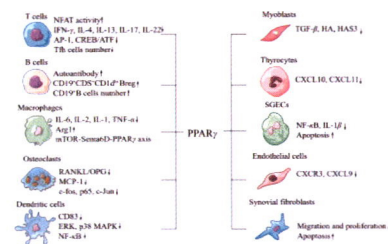
3124

PPAR γ 在自身免疫性疾病中的研究进展

杨艳, 周禹, 隗雅姿, 张天泰*

(中国医学科学院、北京协和医学院药物研究所, 北京 100050)

本文就过氧化物酶体增殖物激活受体 γ (peroxisome proliferator-activated receptor γ , PPAR γ) 的生物学术功能、信号转导途径以及对多种参与自身免疫性疾病的发病机制的免疫细胞和基质细胞的激活、极化和功能调节进行总结, 旨在为相关疾病的机制研究和防治策略提供依据。



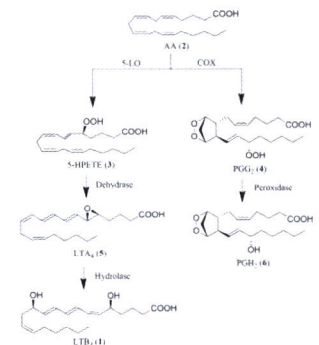
3133

白三烯 B₄ 受体拮抗剂的研究进展

赵甜甜, 沈珑瑛, 潘显道*

(中国医学科学院、北京协和医学院药物研究所, 北京 100050)

本文简略描述了白三烯 B₄ (LTB₄) 的作用, 综述了目前处于临床或临床前研究的 LTB₄ 受体拮抗剂的研究进展。



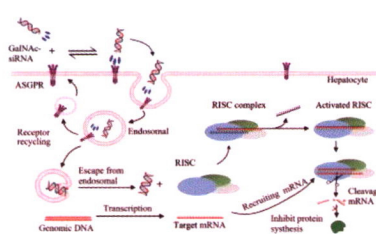
3146

小干扰 RNA (siRNA) 药物药代动力学特征及生理药代动力学建模现状

李倩, 陈锐*, 胡蓓*

(中国医学科学院、北京协和医学院, 北京协和医院临床药理研究中心, 北京 100730)

小干扰 RNA (siRNA) 类药物通过 RNA 干扰机制发挥基因沉默作用, siRNA 类药物的生理药代动力学 (PBPK) 建模需要整合系统参数、药物特异性参数并依据 siRNA 药物独特作用机制将关键步骤参数化, PBPK 模型应用在 siRNA 类药物研发中的应用仍然处于起步阶段。



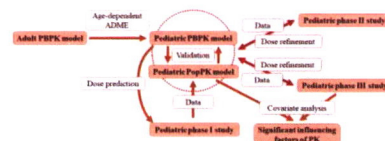
3157

联合应用 PBPK 模型和 PopPK 模型助力儿科用药研发中的剂量选择: 以利伐沙班为例

简伟哲, 陈镡, 周田彦*

(北京大学药学院药剂系, 北京 100191)

本文以利伐沙班儿科用药研发为例, 介绍基于生理的药物动力学 (PBPK) 模型和群体药物动力学 (PopPK) 模型在儿科 I、II、III 期临床试验中设计和验证给药方案的联合应用, 为其他儿科用药研发中模型引导的药物研发 (MIDD) 的应用提供参考。

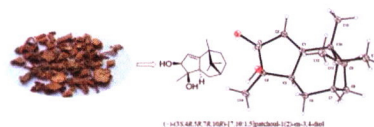
**研究论文**

3163

广藿香油中 1 个新的广藿香烷型倍半萜及其抗炎活性张天浩^{1,2}, 彭成^{1,2}, 左静^{1,2}, 郑琪^{1,2}, 蒙春旺^{1,2}, 郭力^{1,2}, 周勤梅^{1,2,3*}, 熊亮^{1,2*}

(1. 成都中医药大学药学院, 省部共建西南特色中药资源国家重点实验室, 四川 成都 611137; 2. 成都中医药大学, 西南特色药材创新药物成分研究所, 四川 成都 611137; 3. 成都中医药大学, 中医药创新研究院, 四川 成都 611137)

(-)-(3*S*,4*R*,5*R*,7*R*,10*R*)-[7,10:1,5]Patchoul-1(2)-en-3,4-diol, 一个从广藿香油中分离得到的新颖的广藿香烷型倍半萜, 对 LPS 诱导的 RAW264.7 细胞释放 NO 具有抑制作用。



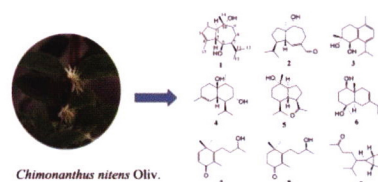
3168

山蜡梅叶中 1 个新的愈创木烷型倍半萜

郭娜, 吴华强, 舒任庚*

(江西中医药大学药学院, 江西 南昌 330004)

运用硅胶柱色谱、ODS 柱色谱、Sephadex LH-20 柱色谱及半制备高效液相等多种色谱分离技术, 从山蜡梅叶中分离得到 9 个化合物, 其中, 化合物 1 为新的愈创木烷型倍半萜, 化合物 2~9 为首次从山蜡梅植物中分离得到。

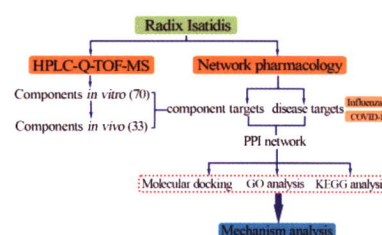


3173

基于 HPLC-Q-TOF-MS 和网络药理学分析板蓝根防治流感及 COVID-19 的作用机制王星琪¹, 常金¹, 张倩¹, 林丽娜¹, 邵平², 李清^{1*}

(1. 沈阳药科大学药学院, 辽宁 沈阳 110016; 2. 本溪国家中成药工程技术研究中心有限公司, 辽宁 本溪 117004)

本文将板蓝根化学成分与网络药理学研究结合, 构建成分-靶点-通路网络探讨板蓝根防治流感及 COVID-19 的潜在分子作用机制。



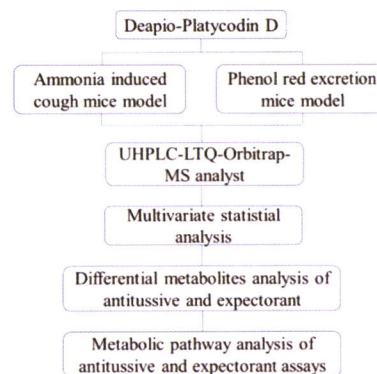
3186

基于代谢组学的去芹糖桔梗皂苷 D 镇咳祛痰机制研究

钟渊涵¹, 王玲珑², 邱自超³, 钟绍辉³, 王新红¹, 曾金祥^{1*}, 张欣雨¹, 刘方圆¹, 王钰洁¹, 孙根林⁴, 周立分⁴, 韦国兵³, 钟国跃¹

(1. 江西中医药大学中药资源与民族药研究中心, 江西 南昌 330004; 2. 江西中医药大学科技学院, 江西 南昌 330004; 3. 江西中医药大学药学院, 江西 南昌 330004; 4. 江西中医药大学大型精密仪器共享服务中心, 江西 南昌 330004)

利用 UHPLC-LTQ-orbitrap-MS 代谢组学技术, 分析去芹糖桔梗皂苷 D 对浓氨水引咳模型以及酚红排泄模型小鼠肺组织内源性代谢物代谢紊乱的调控作用, 明确去芹糖桔梗皂苷 D 发挥镇咳与祛痰作用的代谢调控途径。



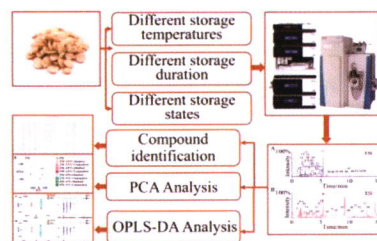
3195

基于 UPLC-MS/MS 技术和代谢组学方法的苦杏仁“临方捣碎”的潜在质量标志物筛选

程遥^{1#}, 毕玥琳^{2#}, 冯欣², 王佳琪², 徐浩然², 张童画², 于庚原², 张晨宁², 王景红^{1*}, 孙毅坤^{2*}

(1. 中国中医科学院望京医院药学部, 北京 100102; 2. 北京中医药大学中药学院, 北京 102488)

本研究模拟临床应用中苦杏仁的储存情况, 收集不同储存状态、储存时间和储存温度下的样品, 并采用超高效液相色谱-四极杆-静电轨道场离子阱质谱仪 (UPLC-Q-exactive-orbitrap-MS) 及植物代谢组学方法筛选其差异化合物, 为苦杏仁的最佳保存方式及最佳炮制方式提供科学依据。



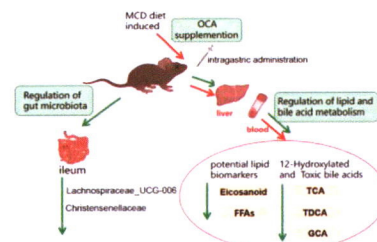
3203

奥贝胆酸对 MCD 饮食诱导的非酒精性脂肪性肝炎小鼠血清脂质与胆汁酸以及肠道菌群的调节作用

王威^{1#}, 罗萍^{2#}, 苗潇磊², 曾贝¹, 王俊俊^{1*}, 陈勇^{1*}

(1. 湖北大学, 中药生物技术湖北省重点实验室, 药物高通量筛选技术国家地方联合工程研究中心, 生物催化与酶工程国家重点实验室, 湖北 武汉 430062; 2. 湖北科技学院医学部药学院, 湖北 咸宁 437100)

本文基于代谢组学和肠道微生物组学技术初步探讨奥贝胆酸对蛋氨酸和胆碱缺乏 (methionine and choline deficient, MCD) 饮食诱导的非酒精性脂肪性肝炎 (non-alcoholic steatohepatitis, NASH) 小鼠血清脂质组学、胆汁酸组学, 以及回肠肠道菌群的影响。研究表明, 奥贝胆酸 (obeticholic acid, OCA) 对 MCD 小鼠的非酒精性脂肪性肝炎具有缓解作用, 可能与其调节游离脂肪酸、氧化脂质、12 α -羟基胆汁酸代谢及肠道克里斯滕森菌科和毛螺菌属丰度有关。



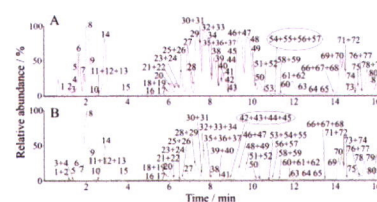
3214

基于 UHPLC/Q-TOF-MS 技术的人血浆磷脂类成分快速分析及质谱裂解规律初探

钟询龙¹, 王若伦¹, 陈莉诗², 钟艳梅^{2*}

(1. 广州医科大学附属第二医院药学部, 广东 广州 510260; 2. 广东药科大学新药研发中心, 广东 广州 510006)

本研究建立了一种简便高效、快捷、稳定的 UHPLC/Q-TOF-MS 分析方法, 对人血浆磷脂类成分进行全面地定性分析, 并总结其质谱裂解规律。

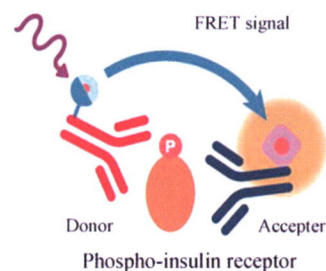


3223

均相时间分辨荧光法测定人胰岛素生物学活性王绿音¹, 杨艳枫^{1,2}, 张孝明¹, 吕萍¹, 张慧¹, 李晶^{1*}, 梁成罡^{1*}

(1. 中国食品药品检定研究院激素室, 国家卫生健康委员会生物技术产品检定方法及其标准化重点实验室, 北京 102629; 2. 中国药科大学, 江苏 南京 211198)

本研究建立了一种基于均相时间分辨荧光技术的人胰岛素体外生物学活性测定方法, 该方法操作简便、耗时短、准确度高、精密度好, 可用于胰岛素类产品的生物学活性评价和质量控制。



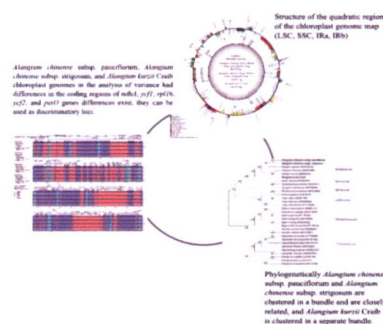
3229

八角枫及其亚种叶绿体基因组序列结构及系统发育分析

杨小英, 刘畅, 曾宪法, 刘雄伟, 赵杰宏, 俸婷婷, 周英*

(贵州中医药大学药学院, 药食两用资源应用与开发研究中心, 贵州 贵阳 550025)

本文对稀花八角枫、伏毛八角枫和毛八角枫的叶绿体基因组比较分析, 挖掘其变异位点, 研究其系统进化关系, 为三者分子鉴别及亲缘关系提供科学依据。

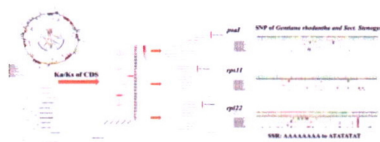


3240

红花龙胆叶绿体基因组特征及适应性进化分析邓港^{1,2}, 吴田泽^{1,2}, 高冉冉¹, 王梦月¹, 刘霞^{2*}, 向丽^{1*}

(1. 中国中医科学院中药研究所, 中药鉴定与安全性评估北京市重点实验室, 北京 100700; 2. 武汉理工大学化学化工与生命科学学院, 湖北 武汉 430070)

本研究以红花龙胆为材料, 通过高通量测序、组装和基因注释, 得到红花龙胆叶绿体全基因组, 完成叶绿体基因组系统发育分析、密码子偏好性分析、重复序列分析, 并利用适应性进化分析探讨了复杂的龙胆属分类问题, 结论支持了红花龙胆及狭蕊组物种独立成属的观点, 为红花龙胆叶绿体基因工程、遗传多样性分析、分子育种等研究奠定了基础。

**新药发现与研究实例简析**

3254

鲜明创新特征的库潘尼西

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)

Special Reports I: New Targets, New Strategies for Drug Discovery and Advances in Antiviral Drug Research

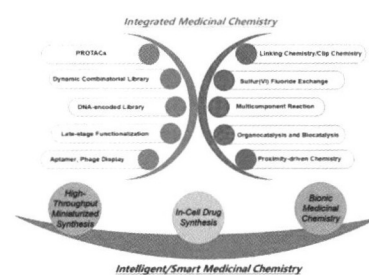
2889

Integrated medicinal chemistry: new modalities and methodologies in drug discovery

XU Shu-jing[#], DING Dang[#], LIU Xin-yong^{*}, ZHAN Peng^{*}

(Key Laboratory of Chemical Biology (Ministry of Education), Department of Medicinal Chemistry, School of Pharmaceutical Sciences, Shandong University, Jinan 250012, China)

This review summarizes new enabling drug discovery technologies, the emergence of new subfields formed through integration innovations and practical chemistry toolbox in the field of medicinal chemistry.



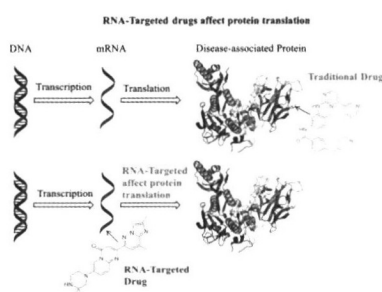
2902

Research progress of small molecular drugs targeting RNA

DU Xiao-li, CHEN Hui-hui, YE Xiang-yang^{*}, XIE Tian^{*}, HE Xing-rui^{*}

(Key Laboratory of Elemene Class Anti-Cancer Chinese Medicines; Engineering Laboratory of Development and Application of Traditional Chinese Medicines; Collaborative Innovation Center of Traditional Chinese Medicines of Zhejiang Province, School of Pharmacy, Hangzhou Normal University, Hangzhou 311121, China)

Small molecular drugs targeting RNA can treat diseases by affecting the translation process of mRNA.



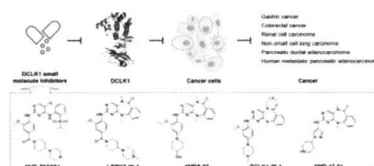
2914

Research progress of small molecule inhibitors of doublecortin-like kinase 1

CHEN Yu-ping[#], LI Ke-liang[#], SHENG Chun-quan^{*}, WU Shan-chao^{*}

(The Second Military Medical University, Shanghai 200433, China)

This article reviews the research progress in the discovery, structure type, structural optimization, biological activity and mechanism of action of DCLK1 small molecule inhibitors, and provides research basis for the development of new anti-tumor small molecule inhibitors targeting DCLK1.



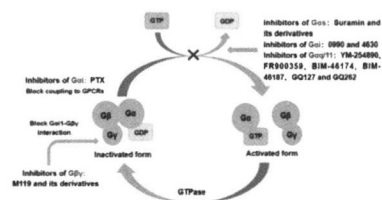
2921

Research progress on the G protein modulators

YANG Yi-fan[#], HU Zhuo-rui[#], LIU He, LI Yi-xian, LIU Lu, XIONG Xiao-feng^{*}

(School of Pharmaceutical Sciences, Sun Yat-sen University, Guangzhou 510006, China)

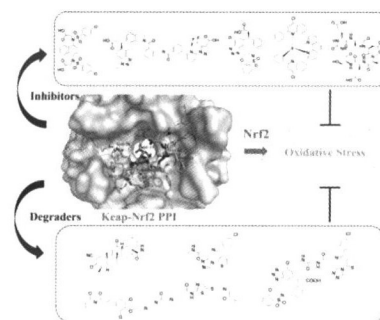
This review summarized the correlations between G protein and diseases, and reviewed the current G protein modulators.



2932

Advances on Keap1-Nrf2 protein-protein interaction inhibitors and degradersYAN Jian-yu, LIU Guo-dong, MIAO Zhen-yuan, ZHUANG Chun-lin*
(School of Pharmacy, Second Military Medical University, Shanghai 200433, China)

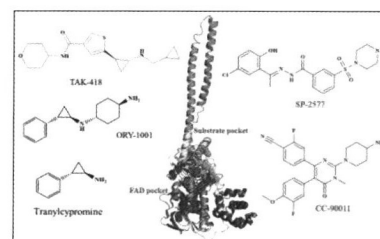
Based on the structural classification, this review summarizes the research progresses on the chemical structures, biological activity and structure-activity relationships of the inhibitors targeting Keap1-Nrf2 protein-protein interaction and degraders based on the Keap1 E3 ubiquitination system in recent years.



2949

Advances on clinical research of histone demethylase LSD1 inhibitorsSHI Yu-ting, YANG Xin-yu, YU Bin*, SONG Yi-hui*
(School of Pharmaceutical Sciences, Zhengzhou University, Zhengzhou 450001, China)

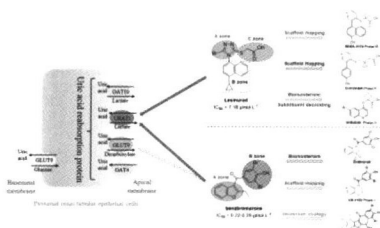
Lysine-specific demethylase 1 (LSD1) targeted irreversible inhibitors including tranylcypromine, ORY-1001, ORY-2001, GSK-2879552, IMG-7289, INCB059872, TAK-418, LH-1802 and reversible inhibitors including CC-90011 and SP-2577 have been approved for clinical assessment in either mono- or combinational therapy manner. These inhibitors have displayed great potential for clinical therapy, while still face big challenges such as toxic side effects.



2960

Research progress and medicinal chemistry strategies of URAT1 inhibitorsSHI Xiao-yu, ZHAO Tong, ZHANG Jian, LIANG Rui-peng, ZHANG Zhi-jiao, LIU Xin-yong*, ZHAN Peng*
(Key laboratory of Chemical Biology (Ministry of Education), Department of Medicinal Chemistry, School of Pharmaceutical Sciences, Shandong University, Jinan 250012, China)

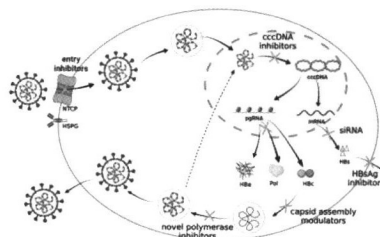
In this article, URAT1 inhibitors with uric acid-lowering or anti-gout pharmacological effects are reviewed, and related medicinal chemical strategies are analyzed, hoping to provide valuable insights into the discovery of new URAT1 inhibitors.



2972

The recent advance of direct anti-HBV drug candidates in clinical trialsWANG Mei¹, LIU Lin-yue¹, LI Chuan-ju¹, LIU Jun^{2*}, JIA Hai-yong^{1*}
(1. School of Pharmacy, Weifang Medical University, Weifang 261053, China;
2. School of Nursing, Weifang Medical University, Weifang 261053, China)

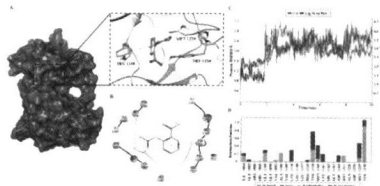
At present, there are a series of new candidate drugs targeting the different phases of HBV life cycle, which including entry inhibitors, core protein inhibitors, RNA interference, cccDNA inhibitors, HBsAg release inhibitors, and polymerase inhibitors. Herein, we review the current status of the therapeutic compounds and recent advance of aforementioned drug candidates in clinical trials.



2985

Aspirin inhibits tumor cell metastasis mediated by HGF/c-MetDAI Xiao-yang*, CHEN Si-kang, CHE Jin-xin
(College of Pharmaceutical Science, Zhejiang University, Hangzhou 310058, China)

This study demonstrates that c-Met is a potential target for aspirin. By binding to c-Met, aspirin prevents the activation of the HGF/c-Met signal axis, thereby inhibiting tumor metastasis and invasion. This study provides new perspectives and evidences for understanding the inhibitory effect of aspirin on tumor metastasis, and also provides a new strategy for the development of c-Met small molecule inhibitors.

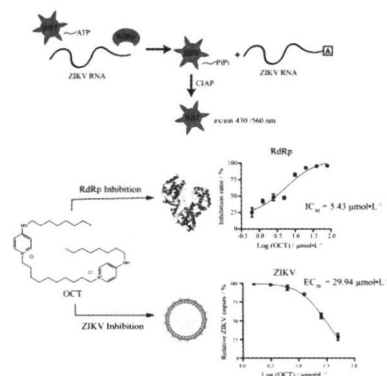


2995

Screening and activity analysis of ZIKV RdRp inhibitors

ZHANG Hong-juan[#], CHEN Ying[#], HAN Yan-xing, LIN Yuan^{*}, JIANG Jian-dong^{*}
(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)

According to the fluorescence-based alkaline phosphatase-coupled polymerase assay method, we established the Zika virus (ZIKV) RNA-dependent RNA polymerase (RdRp) inhibitor screening model. Through screening from an anti-infection compound library, we found a compound octenidine dihydrochloride (OCT) that could inhibit ZIKV RdRp activity. Moreover, OCT exhibited an inhibitory effect on ZIKV replication in the anti-ZIKV experiment.



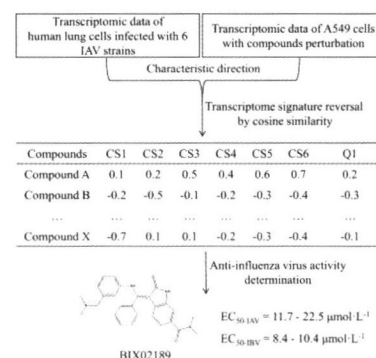
3002

Discovering BIX02189 as a novel anti-influenza virus compound using transcriptome signature reversion strategy

WU You^{1,2#}, CHEN Shu-bing^{1,2#}, TANG Ke^{1,2}, GUO Ying^{1,2*}

(1. 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; 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)

By using the transcriptome signature reversal strategy, the cosine similarity between the transcriptomic signatures of influenza-infected cells and the cells perturbed by compound library were calculated and a compound list was obtained. The anti-influenza activities of the listed compounds were evaluated and BIX02189 was identified with anti-influenza A virus and anti-influenza B virus activity.

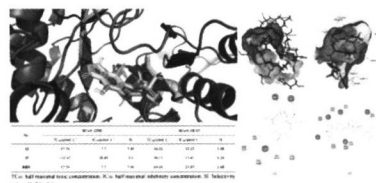


3011

Virtual screening and activity study of antiviral compounds targeting inosine 5'-monophosphate dehydrogenase

KOU Shi-bo, GAO Rong-mei, YI Hong, SUN Lian-qi, LI Yu-huan, LI Zhuo-rong^{*}
(Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)

Based on inosine 5'-monophosphate dehydrogenase (IMPDH) protein structure, novel lead compounds **12** and **15** with anti-coronavirus activity were found using molecular docking and anti-coronavirus HCoV-229E and HCoV-OC43 activity test.



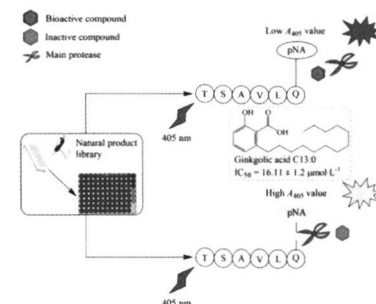
3019

Discovery of a novel SARS-CoV-2 main protease inhibitor by a simple and optimized colorimetric screening assay

YAN Gan-gan¹, YAN Hao-hao¹, LIU Zhi-cheng¹, QI Hai-yan¹, LIU Xiao-li¹, LIU Xiao-ping¹, ZHANG Jing^{2*}, CHEN Yun-yu^{1*}

(1. Institute for Drug Screening and Evaluation, Wannan Medical College, Wuhu 241002, China; 2. Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100050, China)

Identification ginkgolic acid C13:0 as a novel competitive SARS-CoV-2 main protease inhibitor using a simple and optimized colorimetric screening assay.



Special Reports II: Traditional Chinese Medicine in the Prevention and Treatment of Cardio-cerebrovascular Related Diseases

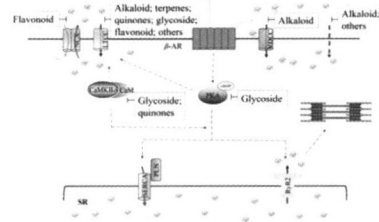
3027

Research progress on applying plant-derived natural calcium channel blockers in the antiarrhythmic drug development

PU Li-hua^{1,2}, HE Shuang^{1,2}, ZHOU Zheng-can^{1,2}, ZHU Yan^{1,2*}

(1. State Key Laboratory of Component-based Chinese Medicine, Tianjin University of Traditional Chinese Medicine, Tianjin 301617, China; 2. Research and Development Center of Traditional Chinese Medicine, Tianjin International Joint Academy of Biomedicine, Tianjin 300457, China)

The review summarizes the research progress on applying plant-derived natural calcium channel blockers in the antiarrhythmic drug development, providing theoretical basis for drug development of using natural calcium channel blockers to prevent and treat arrhythmia in the future.



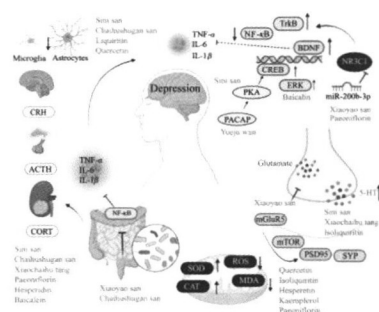
3035

Research progress on the pharmacodynamic mechanism of antidepressant compound prescriptions and its flavonoids active ingredients

HAO Wen-zhi¹, WANG Lu¹, HUANG Jun-qing^{1*}, CHEN Jia-xu^{1,2*}

(1. Guangzhou Key Laboratory of Formula-Pattern of Traditional Chinese Medicine, Jinan University, Guangzhou 510632, China; 2. School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing 100029, China)

In this review, the pharmacodynamic mechanism of antidepressant compound prescriptions and its flavonoids active ingredients were summarized.



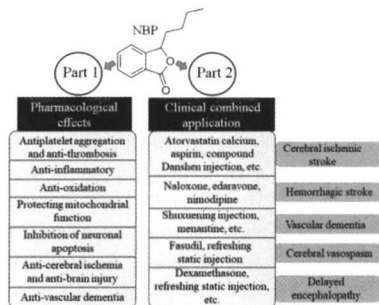
3047

Research progress on pharmacological effects and clinical combined application of 3-n-butylphthalide in cerebrovascular diseases

NI Wen-juan¹, LI Wei-xia^{2*}, WANG Xiao-yan², WU Ya-li², HAN Bing¹, JIA Jin-hao¹, LI Kun¹, JI Qiu-ru¹, TANG Jin-fa^{2*}

(1. Henan University of Chinese Medicine, Zhengzhou 450046, China; 2. Henan Province Engineering Research Center of Clinical Application, Evaluation and Transformation of Traditional Chinese Medicine, Henan Provincial Key Laboratory for Clinical Pharmacy of Traditional Chinese Medicine, the First Affiliated Hospital of Henan University of Chinese Medicine, Zhengzhou 450000, China)

Pharmacological effects of 3-n-butylphthalide (NBP) on cerebrovascular diseases and its clinical combined application with other drugs.



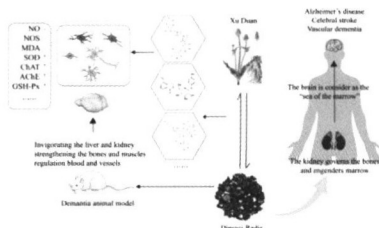
3057

Research progress on the anti-dementia effect of Dipsaci Radix and its active compounds

CUI Jin-shuai¹, LIU yan¹, WANG Zi-ying^{1*}, CHENG Gang^{1,2*}

(1. Interdisciplinary Institute of Individualized Prevention and Treatment of Encephalopathy, School of Traditional Chinese Medicine, Jinan University, Guangzhou 510632, China; 2. Key Laboratory of Endemic and Minority Diseases of Ministry of Education, Guizhou Medical University, Guiyang 550004, China)

Dipsaci Radix and its active compounds could ameliorate dementia symptoms via multiple targets and molecular mechanisms.

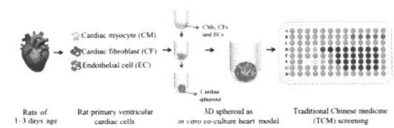


3067

Establishment of 3D organoids model of cardiac hypertrophy and its application in the mechanistic analysis of cardiovascular traditional Chinese medicine

FAN Si-wen^{1,2}, ZHAO Yu-han^{1,2}, XIAO Guang-xu^{1,2}, FAN Guan-wei^{1,3}, ZHU Yan^{1,2*}

(1. State Key Laboratory of Component-based Chinese Medicine of Tianjin University of Traditional Chinese Medicine, Tianjin 300193, China; 2. Chinese Medicine New Drug Research and Development Center, International Biomedical Research Institute, Tianjin 300457, China; 3. Tianjin Key Laboratory of Translational Research of TCM Prescription and Syndrome, First Teaching Hospital of Tianjin University of Traditional Chinese Medicine, Tianjin 300193, China)



In this study, the new 3D cardiac organoid *in vitro* model was established. Based on this model, the function of organoids and disease indicators were evaluated, and it was used to reveal the role of Guanxinning Injection (GXNI) in the treatment of cardiovascular diseases for the first time.

3077

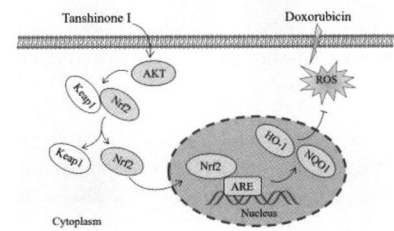
Tanshinone I attenuates doxorubicin-induced cardiotoxicity based on the Akt-Nrf2 antioxidant pathway

JIANG Qian-qian^{1,2,3}, ZHANG Jing-mej^{1,2,3}, XUE Si-ming^{1,2,3}, TIAN Xue^{1,2,3},

CHEN Xu^{2,3,4}, LIU Tian-tian^{2,3,4}, JIANG Yan-yan^{1,2,3}, SUN Qian-bin^{1,2,3},

GUO Dong-qing^{1,2,3}, LI Chun^{2,3,5}, WANG Yong^{2,3,4*}, WANG Qi-yan^{1,2,3*}

(1. School of Life Sciences, Beijing University of Chinese Medicine, Beijing 100029, China; 2. Key Laboratory of TCM Syndrome and Formula (Beijing University of Chinese Medicine), Ministry of Education, Beijing 100029, China; 3. Beijing Key Laboratory of TCM Syndrome and Formula, Beijing 100029, China; 4. School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing 100029, China; 5. Modern Research Center for Traditional Chinese Medicine, School of Chinese Materia Medica, Beijing University of Chinese Medicine, Beijing 100029, China)



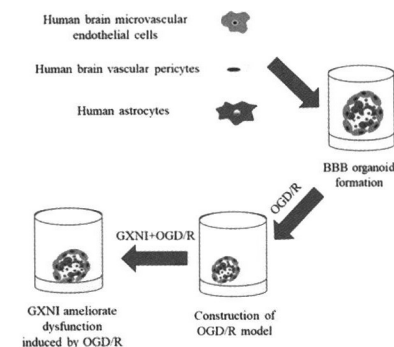
Tanshinone I protects doxorubicin-induced cardiotoxicity by regulating nuclear erythroid factor 2-related factor 2 (Nrf2) pathway.

3086

Construction of 3D blood-brain barrier organoid oxygen-glucose deprivation model and exploration of the protective effect of Guanxinning injection

DU Hong-ying^{1,2}, XUE Zhi-feng^{1,2}, XIA Zhong-ting^{1,3}, HE Shuang^{1,2}, YANG Jian^{1,2}, ZHU Yan^{1,2*}

(1. State Key Laboratory of Component-based Chinese Medicine, Tianjin University of Traditional Chinese Medicine, Tianjin 301617, China; 2. Chinese Medicine New Drug Research and Development Center, Tianjin International Biomedical Research Institute, Tianjin 300457, China; 3. Increasepharm (Tianjin) Institute Co., Ltd., Tianjin 300385, China)



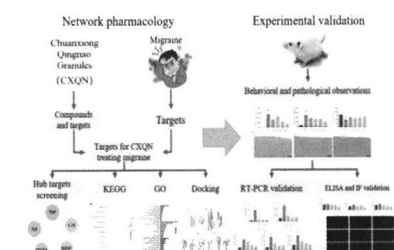
In this study, the oxygen glucose deprivation/reoxygenation (OGD/R) model based on organoid formation was constructed, and the protective effect of Guanxinning injection (GXNI) on OGD/R-induced blood-brain barrier organoid damage was investigated.

3095

Research of the mechanism of Chuanxiong Qingnao Granules in improving migraine based on network pharmacology and experimental validation

HOU Jing-yi¹, NI Li-qi¹, TIAN Liang-liang², XU He², CAO Guang-zhao², WANG Kun¹, HOU Bo-wen¹, ZHANG Jing-jing^{2*}, YANG Hong-jun^{1*}

(1. Beijing Key Laboratory of Traditional Chinese Medicine Basic Research on Prevention and Treatment for Major Diseases, Experimental Research Center, China Academy of Chinese Medical Sciences, Beijing 100700, China; 2. Institute of Chinese Materia Medica, China Academy of Chinese Medical Sciences, Beijing 100700, China)



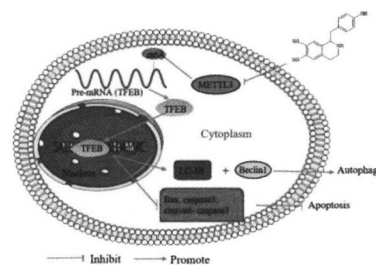
Based on the combination of network pharmacology and experimental verification, this study preliminarily revealed that Chuanxiong Qingnao Granules (CXQN) reduced the release of the inflammatory factors and regulated vascular permeability by regulating the expression of TNF- α , IL-6, VEGFA, IL-1 β , BDNF and related pathways, modulating vascular permeability and central sensitization to exert protective effects on migraine model.

3106

Higenamine attenuates isoproterenol-induced myocardial infarction *via* regulating METTL3/TFEB pathway

XIE Bao-ping^{1,2}, GUO Yi-xin³, YE Man-yi¹, HUANG Xu-can³, LI Xu-ping¹, ZHONG Pei-cheng¹, WANG Da-wei⁴, LIU Zhong-qiu^{1,4*}, CHENG Yuan-yuan^{1,4*}

(1. School of Pharmaceutical Sciences, Guangzhou University of Chinese Medicine, Guangzhou 511400, China; 2. Key Laboratory of Prevention and Treatment of Cardiovascular and Cerebrovascular Diseases of Ministry of Education, Gannan Medical University, Ganzhou 341000, China; 3. School of Basic Medical Sciences, Guangzhou University of Chinese Medicine, Guangzhou 511400, China; 4. Shunde Hospital of Guangzhou University of Chinese Medicine, Guangzhou University of Chinese Medicine, Foshan 528333, China)



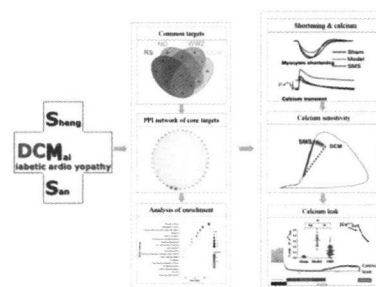
Higenamine inhibits the apoptosis of cardiomyocytes and attenuates isoproterenol-induced myocardial infarction in rat. Its mechanism may be associated with regulating methyltransferase-like 3 (METTL3)/transcription factor EB (TFEB)-mediated cardiomyocyte autophagy.

3115

The mechanism of ShengMaiSan reducing calcium leak and protecting myocardial contractile function in diabetic rats based on network pharmacology

HUANG Cong¹, SUN Ming-jie¹, CUI Hai-feng¹, SUN Li-hua¹, WU QIAN¹, ZHAI Qu², SHI Xiao-lu^{1*}

(1. Key Laboratory of TCM Basic Research on Prevention and Treatment of Major Disease, Experimental Research Center, China Academy of Chinese Medical Sciences, Beijing 100700, China; 2. National Medical Products Administration Institute of Executive Development, Beijing 100073, China)



ShengMaiSan may down-regulate the phosphorylation level of ryanodine receptor 2 (RyR2) and reduce the calcium leakage of the sarcoplasmic reticulum through the calcium signaling pathway to protect the myocardial contractile function of diabetic rats.

Reviews

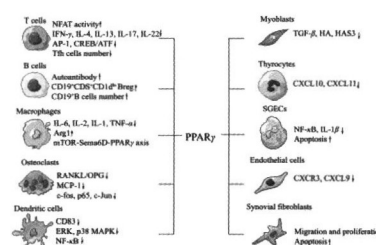
3124

Research progress of the role of PPAR γ in autoimmune diseases

YANG Yan, ZHOU Yu, WEI Ya-zi, ZHANG Tian-tai*

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

This article summarizes the biological functions and signal transduction pathways and of peroxisome proliferator-activated receptor γ (PPAR γ) and concludes the roles of PPAR γ in regulating activation, polarization, and function of immune cells and related stromal cells, aiming to provide theoretical support for the research of mechanism and prevention and treatment of AID.



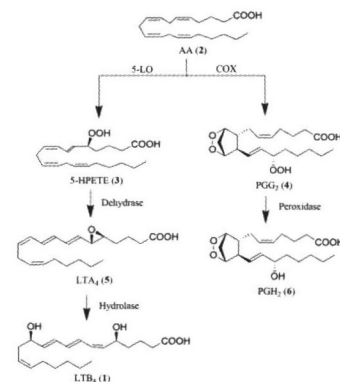
3133

Research progress of leukotriene B₄ receptor antagonists

ZHAO Tian-tian, SHEN Long-ying, PAN Xian-dao*

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

In this review, we briefly describe the biological function of leukotriene B₄ (LTB₄) and summarize the preclinical and clinical developments of LTB₄ receptor antagonists.



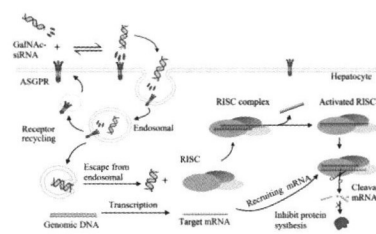
3146

Recent advances in pharmacokinetic characteristics and physiological pharmacokinetic modeling of small interfering RNA (siRNA) drugs

LI Qian, CHEN Rui*, HU Pei*

(Clinical Pharmacology Research Center, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100730, China)

Small interfering RNAs (siRNA) could specifically silence the expression of the targeted gene through RNA interference. Physiologically-based pharmacokinetic (PBPK) modeling of siRNA drugs need to integrate physiologic parameters and drug-specific parameters, and parameterization the key steps based on the unique mechanism of siRNA drugs, but PBPK modeling is still in its infancy in guiding the development of siRNA-based drugs.



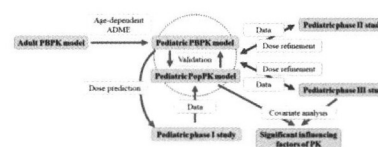
3157

The combined application of PBPK model and PopPK model in the dose selection of pediatric drug development: an example of rivaroxaban

JIAN Wei-zhe, CHEN Rong, ZHOU Tian-yan*

(Department of Pharmaceutics, School of Pharmaceutical Sciences, Peking University, Beijing 100191, China)

The pediatric drug development of rivaroxaban was taken as an example to introduce the combined application of physiologically based pharmacokinetic (PBPK) model and population pharmacokinetic (PopPK) model in the design and validation of pediatric dose regimen in Phase I, II and III trials, which may provide reference to model-informed drug development (MIDD) in other pediatric drug development.



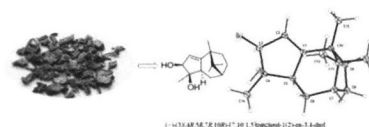
Original Articles

3163

A new patchoulane-type sesquiterpenoid from patchouli oil and its anti-inflammatory activity

ZHANG Tian-hao^{1,2}, PENG Cheng^{1,2}, ZUO Jing^{1,2}, ZHENG Qi^{1,2}, MENG Chun-wang^{1,2}, GUO Li^{1,2}, ZHOU Qin-mei^{1,2,3*}, XIONG Liang^{1,2*}

(1. State Key Laboratory of Southwestern Chinese Medicine Resources, School of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 2. Institute of Innovative Medicine Ingredients of Southwest Specialty Medicinal Materials, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China; 3. Innovation Institute of Chinese Medicine and Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu 611137, China)



(-)-(3*S*,4*R*,5*R*,7*R*,10*R*)-[7,10:1,5]Patchoul-1(2)-en-3,4-diol, a new patchoulane-type sesquiterpenoid isolated from patchouli oil, has an inhibitory effect on LPS-induced NO production in RAW264.7 cells.

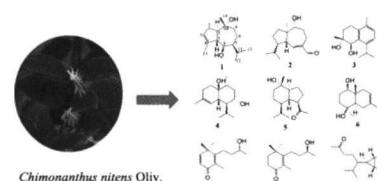
3168

A new guaiane-sesquiterpenoid from the leaves of *Chimonanthus nitens* Oliv.

GUO Na, WU Hua-qiang, SHU Ren-geng*

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

Nine compounds were isolated from the leaves of *Chimonanthus nitens* Oliv. by silica gel, ODS, Sephadex LH-20 column chromatography and semi-preparative HPLC. Among them, compound **1** is a new guaiane-sesquiterpenoid, and compounds **2–9** were isolated from this plant for the first time.

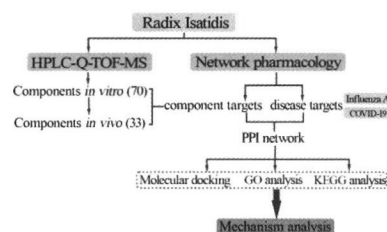


3173

The mechanism of *Isatidis Radix* in the prevention of influenza and COVID-19 by HPLC-Q-TOF-MS combined with network pharmacology

WANG Xing-qi¹, CHANG Jin¹, ZHANG Qian¹, LIN Li-na¹, SHAO Ping², LI Qing^{1*}
(1. School of Pharmacy, Shenyang Pharmaceutical University, Shenyang 110016, China; 2. NERC for the Pharmaceutics of Traditional Chinese Medicines, Benxi 117004, China)

This study built a component-target-pathway network to investigate the potential molecular mechanism of *Isatidis Radix* for the prevention of influenza and COVID-19 based on the chemical composition and network pharmacology.

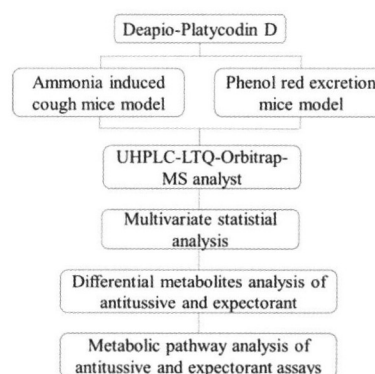


3186

The antitussive and expectorant mechanisms of deapio-platycodin D as determined by metabolomics

ZHONG Yuan-han¹, WANG Ling-long², QIU Zi-chao³, ZHONG Shao-hui³, WANG Xin-hong¹, ZENG Jin-xiang^{1*}, ZHANG Xin-yu¹, LIU Fang-yuan¹, WANG Yu-jie¹, SUN Gen-lin⁴, ZHOU Li-fen⁴, WEI Guo-bing³, ZHONG Guo-yue¹
(1. Research Center of Chinese Medicine Resources and Ethnic Minority Medicine, Jiangxi University of Chinese Medicine, Nanchang 330004, China; 2. College of Science and Technology, Jiangxi University of Chinese Medicine, Nanchang 330004, China; 3. School of Pharmacy, Jiangxi University of Chinese Medicine, Nanchang 330004, China; 4. Large Precision Instrument Sharing Service Center, Jiangxi University of Chinese Medicine, Nanchang 330004, China)

The UHPLC-LTQ-orbitrap-MS metabolomics technique was used to analyze the regulation effect of deapio-platycodin D on the disturbance of endogenous metabolite metabolism in lung tissues of mice with ammonia-induced cough model and phenol red excretion model, and to clarify the metabolic regulation pathway of deapio-platycodin D on antitussive and expectorant effects.



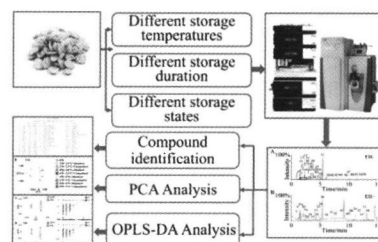
3195

Identification of potential Q-markers of *Semen Armeniacae Amarum* based on UPLC-MS/MS and metabolomics

CHENG Yao^{1#}, BI Yue-lin^{2#}, FENG Xin², WANG Jia-qi², XU Hao-ran², ZHANG Tong-hua², YU Geng-yuan², ZHANG Chen-ning², WANG Jing-hong^{1*}, SUN Yi-kun^{2*}

(1. Department of Pharmacy, Wangjing Hospital, Chinese Academy of Traditional Chinese Medicine, Beijing 100102, China; 2. College of Traditional Chinese Medicine, Beijing University of Traditional Chinese Medicine, Beijing 102488, China)

In this study, we simulated the storage of bitter almonds in clinical applications, collected samples under different storage states, storage times and storage temperatures, and screened their differential compounds by UPLC-Q-exactive-orbitrap-MS and plant metabolomics to provide a scientific basis for the optimal preservation of bitter almonds and the best preparation method.



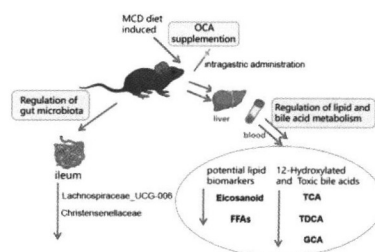
3203

Regulation of obeticholic acid on serum lipids and bile acids and gut microbiota of non-alcoholic steatohepatitis mice induced by methionine and choline deficiency diet

WANG Wei^{1#}, LUO Ping^{2#}, MIAO Xiao-lei², ZENG Bei¹, WANG Jun-jun^{1*}, CHEN Yong^{1*}

(1. Hubei Province Key Laboratory of Biotechnology of Chinese Traditional Medicine, National & Local Joint Engineering Research Center of High-throughput Drug Screening Technology, State Key Laboratory of Biocatalysis and Enzyme Engineering, Hubei University, Wuhan 430062, China; 2. School of Pharmacy, Hubei University of Science and Technology, Xianning 437100, China)

Based on metabolomics and gut microbiome, we preliminarily discuss the effects of obeticholic acid on serum lipid and bile acid metabolomics and ileal gut microbiota of methionine and choline deficient (MCD) mice. The results show that obeticholic acid (OCA) alleviated nonalcoholic steatohepatitis in MCD mice, which may be related to its regulation of free fatty acids, eicosanoids, 12 α -hydroxylated bile acid metabolism, and the relative abundance of intestinal Christensenellaceae and Lachnospiraceae_UCG-006.



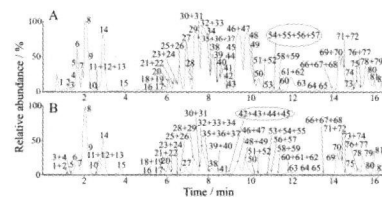
3214

Rapid analysis and determination of the fragmentation regularity of phospholipids in human plasma based on UHPLC/Q-TOF-MS

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A simple, efficient, fast and stable UHPLC/Q-TOF-MS analytical method was established in this study for the qualitative analysis of phospholipids in human plasma and summarize the characteristic mass spectrometric fragmentation pattern.



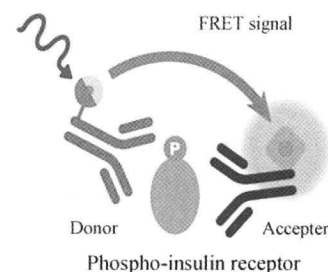
3223

Determination of biological activity of human insulin by a homogeneous time-resolved fluorescence method

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A bioassay for determining the *in vitro* bioactivity of human insulin based on homogeneous time-resolved fluorescence technique was established. The method was simple, time-consuming, accurate and precision, and could be used for the biological activity evaluation and quality control of the product.



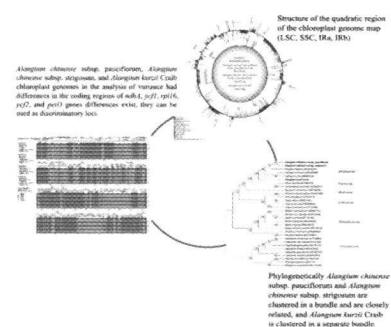
3229

Sequence structure and phylogenetic analysis of the chloroplast genomes of *Alangium chinense* (Lour.) Harms and its different subspecies

YANG Xiao-ying, LIU Chang, ZENG Xian-fa, LIU Xiong-wei, ZHAO Jie-hong, FENG Ting-ting, ZHOU Ying*

(Research Center for Application and Development of Medicinal and Food Resources, College of Pharmacy, Guizhou University of Traditional Chinese Medicine, Guiyang 550025, China)

In this paper, the chloroplast genomes of *Alangium chinense* subsp. *Pauciflorum*, *Alangium chinense* subsp. *Strigosum* and *Alangium kurzii* Craib were compared and analyzed, their mutation sites were excavated, and their phylogenetic relationships were studied, which provided scientific basis for molecular identification and genetic relationship among them.



3240

Characteristics and adaptive evolution analysis of the chloroplast genome of *Gentiana rhodantha*

DENG Gang^{1,2}, WU Tian-ze^{1,2}, GAO Ran-ran¹, WANG Meng-yue¹, LIU Xia^{2*}, XIANG Li^{1*}

(1. Key Laboratory of Beijing for Identification and Safety Evaluation of Chinese Medicine, Institute of Chinese Materia Medica, China Academy of Chinese Medical Sciences, Beijing 100700, China; 2. School of Chemistry, Chemical Engineering and Life Sciences, Wuhan University of Technology, Wuhan 430070, China)



In this study, the whole chloroplast genome of *Gentiana rhodantha* was obtained by high-throughput sequencing, assembly and gene annotation, and the phylogenetic analysis, codon preference analysis and repetitive sequence analysis of the chloroplast genome were completed. the complex classification of *Gentiana* was explored using adaptive evolutionary analysis. The findings support the view that *Sect. Stenogyne* is an independent genus, and lay the foundation for genetic engineering, genetic diversity analysis and molecular breeding of *G. rhodantha*.

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