



碧云天生物技术/Beyotime Biotechnology
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NP-40裂解液

产品编号	产品名称	包装
P0013F	NP-40裂解液	100ml

产品简介:

- 碧云天生产的NP-40裂解液(NP-40 Lysis Buffer)是一种比较温和的细胞组织裂解液。NP-40裂解液裂解得到的蛋白样品可以用于常规的PAGE、Western、免疫沉淀(immunol precipitation, IP)、免疫共沉淀(co-IP)和ELISA等。
- 本产品可以用于动物、植物的细胞或组织样品,也可以用于真菌或细菌样品。
- 关于碧云天生产的不同的裂解液的主要特点和差异,以及如何选择裂解液可参考我们的相关网页:
<http://www.beyotime.com/support/lysis-buffer.htm>。
- NP-40裂解液的主要成分为50mM Tris(pH7.4), 150mM NaCl, 1% NP-40以及sodium pyrophosphate, β -glycerophosphate, sodium orthovanadate, sodium fluoride, EDTA, leupeptin等多种抑制剂。可以有效抑制蛋白降解。
- 用NP-40裂解液裂解得到的蛋白样品,可以用碧云天生产的BCA蛋白浓度测定试剂盒(P0009/P0010/P0010S/P0011/P0012/P0012S)测定蛋白浓度。由于含有较高浓度的去垢剂,不能用Bradford法测定由本裂解液裂解得到样品的蛋白浓度。

包装清单:

产品编号	产品名称	包装
P0013F	NP-40裂解液	100ml
—	说明书	1份

保存条件:

-20°C保存,一年有效。

注意事项:

- 为取得最佳的使用效果,尽量避免过多的反复冻融。可以适当分装后使用。
- 需自备PMSF。PMSF(ST506)可以向碧云天订购。也可以选购总体效果更佳的碧云天生产的P1045/P1046 蛋白酶磷酸酶抑制剂混合物(通用型, 50X),或者根据具体用途选择P1048/P1049 蛋白酶磷酸酶抑制剂混合物(通用型, 质谱兼容, 50X)、P1050/P1051蛋白酶磷酸酶抑制剂混合物(哺乳动物样品抽提用, 50X)、P1055/P1056 蛋白酶磷酸酶抑制剂混合物(植物样品抽提用, 50X)、P1060/P1061 蛋白酶磷酸酶抑制剂混合物(真菌或酵母抽提用, 50X)、P1065/P1066 蛋白酶磷酸酶抑制剂混合物(细菌抽提用, 50X)。如果无需检测磷酸化蛋白,也可以选不含磷酸酶抑制剂的蛋白酶抑制剂化合物。
- 裂解样品的所有步骤都需在冰上或4°C进行。
- 关于裂解液的选择,一方面可以参考我们的相关网页: <http://www.beyotime.com/support/lysis-buffer.htm> 选择合适的裂解液;另一方面也需要通过一些预实验来摸索最佳的适合您实验条件的裂解液。
- 本产品仅限于专业人员的科学研究用,不得用于临床诊断或治疗,不得用于食品或药品,不得存放于普通住宅内。
- 为了您的安全和健康,请穿实验服并戴一次性手套操作。

使用说明:

1. 对于培养细胞样品:

- 融解 NP-40 裂解液,混匀。取适当量的裂解液,在使用前数分钟内加入 PMSF,使 PMSF 的最终浓度为 1mM,或者根据实验需要加入适当的上述蛋白酶磷酸酶抑制剂混合物。
- 对于贴壁细胞:** 去除培养液,用 PBS、生理盐水或无血清培养液洗一遍(如果血清中的蛋白没有干扰,可以不洗)。按照 6 孔板每孔加入 150--250 微升裂解液的比例加入裂解液。用枪吹打数下,使裂解液和细胞充分接触。通常裂解液接触动物细胞 1-2 秒后,细胞就会被裂解。植物细胞宜在冰上裂解 2-10min。

对于悬浮细胞: 离心收集细胞,轻轻vortex或者弹击管底以把细胞尽量分散开。按照6孔板每孔细胞加入150-250微升裂解液的比例加入裂解液。再用手轻弹以充分裂解细胞。充分裂解后应没有明显的细胞沉淀。如果细胞量较多,必需分装成50-100万细胞/管,然后再裂解。

对于细菌或酵母: 对于1ml菌液或酵母液,离心去上清,如果有必要可以使用PBS洗涤一次,充分去除液体后,轻轻vortex或者弹击管底以把细菌或酵母尽量弹散。加入100-200微升裂解液,轻轻vortex或者弹击管底以混匀,冰上裂解2-10min。如果希望获得更好的裂解效果,细菌和酵母可以分别使用溶菌酶和破壁酶(Lyticase)消化,然后再使用本裂解液进行裂解。

裂解液用量说明: 通常6孔板每孔细胞或者1ml的菌液或酵母液中的细菌和酵母量加入150微升裂解液已经足够,但如果

细胞密度非常高可以适当加大裂解液的用量到200微升或250微升。每100万动物细胞用100微升本产品裂解后获得的上清，其蛋白浓度约为2-4mg/ml，不同细胞有所不同。

c. 充分裂解后，10000-14000g 离心 3-5 分钟，取上清，即可进行后续的 PAGE、Western 和免疫沉淀等操作。

2. 对于组织样品：

a. 把组织剪切成细小的碎片。

b. 融解 NP-40 裂解液，混匀。取适当量的裂解液，在使用前数分钟内加入 PMSF，使 PMSF 的最终浓度为 1mM，或者根据实验需要加入适当的上述蛋白酶抑制剂混合物。

c. 按照每 20 毫克组织加入 150--250 微升裂解液的比例加入裂解液。(如果裂解不充分可以适当添加更多的裂解液，如果需要高浓度的蛋白样品，可以适当减少裂解液的用量。)

d. 用玻璃匀浆器匀浆，或使用碧云天生产的 E6600 TissueMaster™手持式组织研磨仪研磨，直至充分裂解。也可以把组织样品冷冻后液氮研磨，研磨充分后加入裂解液进行裂解。

e. 充分裂解后，10000-14000g 离心 3-5 分钟，取上清，即可进行后续的 PAGE、Western 和免疫沉淀等操作。每 20mg 冻存的小鼠肝脏组织用 200 微升本裂解液裂解后获得的上清，其蛋白浓度约为 15-25mg/ml，不同状态的不同组织有所不同。

f. 如果组织样品本身非常细小，可以适当剪切后直接加入裂解液裂解，通过强烈 vortex 使样品裂解充分。然后同样离心取上清，用于后续实验。直接裂解的优点是比较方便，不必使用匀浆器或研磨设备，缺点是不如匀浆或研磨那样裂解得比较充分。

附录：碧云天生产的各种裂解液主要特点、差异和选择

首先请参考下表，了解各种裂解液的主要特点和差异。

产品编号	P0013	P0013B	P0013C	P0013D	P0013F	P0013G	P0013J	P0013K
产品名称	Western及IP细胞裂解液	RIPA裂解液(强)	RIPA裂解液(中)	RIPA裂解液(弱)	NP-40裂解液	SDS裂解液	Western及IP细胞裂解液(无抑制剂)	RIPA裂解液(强, 无抑制剂)
有效裂解成分	1% Triton X-100	1% Triton X-100, 1% deoxycholate, 0.1% SDS	1% NP-40, 0.5% deoxycholate, 0.1% SDS	1% NP-40, 0.25% deoxycholate	1% NP-40	1% SDS	1% Triton X-100	1% Triton X-100, 1% deoxycholate, 0.1% SDS
裂解强度	温和	强	中	温和	温和	强	温和	强
对膜蛋白的提取	一般	很好	较好	一般	一般	很好	一般	很好
对胞浆蛋白的提取	很好	很好	很好	很好	很好	很好	很好	很好
对核蛋白的提取	较好	很好	较好	较好	较好	很好	较好	很好
胞浆磷酸化蛋白提取	很好	很好	很好	很好	很好	很好	很好	很好
细胞核转录因子提取	很好	很好	很好	很好	很好	很好	很好	很好
含蛋白酶抑制剂	是	是	是	是	是	是	否	否
含磷酸酯酶抑制剂	是	是	是	是	是	是	否	否
不同物种样品兼容性	高	高	高	高	高	高	高	高
主要用途	WB, IP, co-IP	WB, IP	WB, IP	WB, IP, co-IP	WB, IP, co-IP	WB, ChIP	WB, IP, co-IP	WB, IP

➤ 用于普通的Western、IP或co-IP，我们推荐使用Western及IP细胞裂解液(P0013)，该裂解液已被国内各大研究机构广泛使用，发表大量SCI论文，用户普遍反映很好。裂解细胞或组织后，没有非常粘滞的透明状DNA团块形成，不必采用超声处理等就可以非常理想地用于后续操作。另外该裂解液裂解的产物也适合用于磷酸化蛋白的Western检测。

➤ 对于某些特殊蛋白的IP，如果发现Western及IP细胞裂解液(P0013)效果不是非常理想，可以尝试用RIPA裂解液(强、中或弱)或NP-40裂解液。如果发现IP的时候背景很高，即非特异的蛋白也被IP下来，则需要选用裂解强度较高的裂解液，例如RIPA裂解液(强或中)。如果发现目的蛋白无法被IP下来，则说明裂解液的强度过强，可以使用较为温和的裂解液例如RIPA裂解液(弱)或NP-40裂解液。

➤ 对于某些难溶解蛋白的Western，如果发现Western及IP细胞裂解液(P0013)效果不是非常理想，可以尝试使用裂解强度更高的裂解液例如RIPA裂解液(强、中)或SDS裂解液。使用RIPA裂解液(强)的用户也非常多，发表了大量SCI论文。

➤ 用于特定用途需要自行添加特定抑制剂或不需要添加抑制剂时，可以考虑选购P0013J或P0013K。P0013J在很多时候可以兼容酶活性和生物小分子的检测，对于特定的酶或生物小分子的检测是否兼容需要自行测试，碧云天不提供具体的应用信息。P0013J的裂解能力比P0013K弱一些，但用于酶活性和生物小分子时，P0013J的兼容性通常会更好一些。

使用本产品的文献：

1. Zhang XT, Song TB, Du BL, Li DM, Li XM. Caspase-3 antisense oligodeoxynucleotides inhibit apoptosis in gamma-irradiated human leukemia HL-60 cells. Apoptosis. 2007 Apr;12(4):743-51.

2. Shen Y, Yang X, Dong N, Xie X, Bai X, Shi Y. Generation and selection of immunized Fab phage display library against human B cell lymphoma. Cell Res. 2007 Jul;17(7):650-60.

3. Zhang JQ, Zhao XK, He J, Zhu L, Wang XJ. Expression and role of FGFR2 in bladder transitional cell carcinoma. *China Medical Engineering*. 2007;9:720-725.
4. Guo M, Huang T, Cui Y, Pan B, Shen A, Sun Y, Yi Y, Wang Y, Xiao G, Sun G. PrPC interacts with tetraspanin-7 through bovine PrP154-182 containing alpha-helix 1. *Biochem Biophys Res Commun*. 2008 Jan 4; 365(1):154-7.
5. Wei Y, Weng D, Li F, Zou X, Young DO, Ji J, Shen P. Involvement of JNK regulation in oxidative stress-mediated murine liver injury by microcystin-LR. *Apoptosis*. 2008 Aug;13(8):1031-42.
6. Tang Z, Yang J, Liu X, Wang Y, Peng S. Polyaspartoyl-L-arginine enhances prostacyclin synthesis in rat aortic endothelial cells. *Eur J Pharmacol*. 2008 Dec 28;601(1-3):124-8.
7. Nie W, Yan H, Li S, Zhang Y, Yu F, Zhu W, Fan F, Zhu J. Angiotensin-(1-7) enhances angiotensin II induced phosphorylation of ERK1/2 in mouse bone marrow-derived dendritic cells. *Mol Immunol*. 2009 Jan;46(3):355-61.
8. Fang Z, Wang Q, Cao W, Feng Q, Li C, Xie L, Zhang R. Investigation of phosphorylation site responsible for CaLP (P. fucata) nucleocytoplasmic shuttling triggered by overexpression of p21Cip1. *Mar Biotechnol (NY)*. 2009 Mar-Apr;11(2):270-9.
9. Qin ZX, Zhu HY, Hu YH. Effects of lysophosphatidylcholine on beta-amyloid-induced neuronal apoptosis. *Acta Pharmacol Sin*. 2009 Apr;30(4):388-95.
10. Song L, Kong M, Ma Y, Ba M, Liu Z. Inhibitory effect of 8-(3-chlorostyryl) caffeine on levodopa-induced motor fluctuation is associated with intracellular signaling pathway in 6-OHDA-lesioned rats. *Brain Res*. 2009 Jun 18;1276:171-9.
11. Zhang DL, Chen YQ, Jiang X, Ji TT, Mei B. Oxidative damage increased in presenilin1/presenilin2 conditional double knockout mice. *Neurosci Bull*. 2009 Jun;25(3):131-7.
12. Liu RT, Zou LB, Lü QJ. Liquiritigenin inhibits Abeta(25-35)-induced neurotoxicity and secretion of Abeta(1-40) in rat hippocampal neurons. *Acta Pharmacol Sin*. 2009 Jul;30(7):899-906.
13. Liu J, Zhou R, He Q, Li WI, Zhang T, Niu B, Zheng X, Xie J. Calmodulin kinase II activation of mitogen-activated protein kinase in PC12 cell following all-trans retinoic acid treatment. *Neurotoxicology*. 2009 Jul;30(4):599-604.
14. Yu B, Miao ZH, Jiang Y, Li MH, Yang N, Li T, Ding J. c-Jun protects hypoxia-inducible factor-1alpha from degradation via its oxygen-dependent degradation domain in a nontranscriptional manner. *Cancer Res*. 2009 Oct 1;69(19):7704-12.
15. Hang PZ, Zhao J, Wang YP, Sun LH, Zhang Y, Yang LL, Zhao N, Sun ZD, Mao YY, Du ZM. Reciprocal regulation between M3 muscarinic acetylcholine receptor and protein kinase C-epsilon in ventricular myocytes during myocardial ischemia in rats. *Naunyn-Schmiedeberg's Arch Pharmacol*. 2009 Nov;380(5):443-50.
16. Li H, Zhang L, Huang Q. Differential expression of mitogen-activated protein kinase signaling pathway in the hippocampus of rats exposed to chronic unpredictable stress. *Behav Brain Res*. 2009 Dec 14;205(1):32-7.
17. Xu SB, Liu XH, Li BH, Zhang Y, Yuan J, Yuan Q, Li PD, Yang XZ, Li F, Zhang WJ. DNA methylation regulates constitutive expression of Stat6 regulatory genes SOCS-1 and SHP-1 in colon cancer cells. *J Cancer Res Clin Oncol*. 2009 Dec;135(12):1791-8.
18. Chen Y, Wang J, Yao Y, Yuan W, Kong M, Lin Y, Geng D, Nie R. CRP regulates the expression and activity of tissue factor as well as tissue factor pathway inhibitor via NF-kappaB and ERK 1/2 MAPK pathway. *FEBS Lett*. 2009;583(17):2811-8.
19. Li J, Tian T, Wang XY, Li F, Ren GS. Expression and Clinical Significance of REGy in Gastric Cancer Tissue and Varies Differentiated Gastric Cancer Cell Lines. *Clin Oncol Cancer Res*. 2009;6:208-213.
20. Yu X, Huang Y, Hu Q, Ma L. Hyperhomocysteinemia stimulates hepatic glucose output and PEPCK expression. *Acta Biochim Biophys Sin (Shanghai)*. 2009;41(12):1027-32.
21. Cao BY, Yang YP, Luo WF, Mao CJ, Han R, Sun X, Cheng J, Liu CF. Paeoniflorin, a potent natural compound, protects PC12 cells from MPP+ and acidic damage via autophagic pathway. *J Ethnopharmacol*. 2010;131(1):122-9.
22. Liu J, Wang A, Li L, Huang Y, Xue P, Hao A. Oxidative stress mediates hippocampal neuron death in rats after lithium-pilocarpine-induced status epilepticus. *Seizure*. 2010;19(3):165-72.
23. Li C, Xing G, Dong M, Zhou L, Li J, Wang G, Zou D, Wang R, Liu J, Niu Y. Beta-asarone protection against beta-amyloid-induced neurotoxicity in PC12 cells via JNK signaling and modulation of Bcl-2 family proteins. *Eur J Pharmacol*. 2010;635(1-3):96-102.
24. Li H, Zhang L, Fang Z, Lin L, Wu C, Huang Q. Behavioral and neurobiological studies on the male progeny of maternal rats exposed to chronic unpredictable stress before pregnancy. *Neurosci Lett*. 2010;469(2):278-82.
25. Qian J, Zhai A, Kao W, Li Y, Song W, Fu Y, Chen X, Zhang Q, Wu J, Li H, Zhong Z, Ling H, Zhang F. Modulation of miR-122 on persistently Borna disease virus infected human oligodendroglial cells. *Antiviral Res*. 2010;87(2):249-56.
26. Chen W, Hou J, Yin Y, Jang J, Zheng Z, Fan H, Zou G. alpha-Bisabolol induces dose- and time-dependent apoptosis in HepG2 cells via a Fas- and mitochondrial-related pathway, involves p53 and NFkappaB. *Biochem Pharmacol*. 2010;80(2):247-54.
27. Li XC, Tong GX, Zhang Y, Liu SX, Jin QH, Chen HH, Chen P. Neferine inhibits angiotensin II-stimulated proliferation in vascular smooth muscle cells through heme oxygenase-1. *Acta Pharmacol Sin*. 2010;31(6):679-86.
28. Tu XK, Yang WZ, Wang CH, Shi SS, Zhang YL, Chen CM, Yang YK, Jin CD, Wen S. Zileuton reduces inflammatory reaction and brain damage following permanent cerebral ischemia in rats. *Inflammation*. 2010;33(5):344-52.
29. Sheng R, Gu ZL, Xie ML, Zhou WX, Guo CY. Epigallocatechin gallate protects H9c2 cardiomyoblasts against hydrogen dioxides-induced apoptosis and telomere attrition. *Eur J Pharmacol*. 2010;641(2-3):199-206.
30. Chen YH, Jia XT, Zhao L, Li CZ, Zhang S, Chen YG, Weng SP, He JG. Identification and functional characterization of Dicer2 and five single VWC domain proteins of *Litopenaeus vannamei*. *Dev Comp Immunol*. 2011 Jun;35(6):661-71.
31. Qian G, Jin F, Chang L, Yang Y, Peng H, Duan C. NIRF, a novel ubiquitin ligase, interacts with hepatitis B virus core protein and promotes its degradation. *Biotechnol Lett*. 2012 Jan;34(1):29-36.
32. Kang H, Wang H, Yu Q, Yang Q. Effect of intranasal immunization with inactivated avian influenza virus on local and systemic immune responses in ducks. *Poult Sci*. 2012 May;91(5):1074-80.
33. Chen YH, Zhao L, Jia XT, Li XY, Li CZ, Yan H, Weng SP, He JG. Isolation and characterization of cDNAs encoding Ars2 and Pasha homologues, two components of the RNA interference pathway in *Litopenaeus vannamei*. *Fish Shellfish Immunol*. 2012 Feb;32(2):373-80.
34. Guo E, He Q, Liu S, Tian L, Sheng Z, Peng Q, Guan J, Shi M, Li K, Gilbert LI, Wang J, Cao Y, Li S. MET is required for the maximal action of 20-hydroxycyclopropane during *Bombyx* metamorphosis. *PLoS One*. 2012;7(12):e53256.
35. Yun Y, Zhao GM, Wu SJ, Li W, Lei AM. Replacement of H1 linker histone during bovine somatic cell nuclear transfer. *Theriogenology*. 2012 Oct 1;78(6):1371-80.
36. Zhu M, Wang J, Liu M, Du D, Xia C, Shen L, Zhu D. Upregulation of protein phosphatase 2A and NR3A-pleiotropic effect of simvastatin on ischemic stroke rats. *PLoS One*. 2012;7(12):e51552.
37. Zheng L, Tang W, Wei F, Wang H, Liu J, Lu Y, Cheng Y, Bai X, Yu X, Zhao W. Radiation-inducible protein RbAp48 contributes to radiosensitivity of cervical cancer cells. *Gynecol Oncol*. 2013 Sep; 130(3):601-8.
38. Kang H, Wang H, Yu Q, Yang Q. A novel combined adjuvant strongly enhances mucosal and systemic immunity to low pathogenic avian influenza after oral immunization in ducks. *Poult Sci*. 2013 Jun; 92(6):1543-51.
39. Zhang J, Wu X, Zan J, Wu Y, Ye C, Ruan X, Zhou J. Cellular Chaperonin CCTy Contributes to Rabies Virus Replication during Infection. *J Virol*. 2013 Jul;87(13):7608-21.
40. Xie R, Yang H, Xiao Q, Mao F, Zhang S, Ye F, Wan F, Wang B, Lei T, Guo D. Downregulation of LRIG1 expression by RNA interference promotes the aggressive properties of glioma cells via EGFR/Akt/c-Myc activation. *Oncol Rep*. 2013 Jan;29(1):177-84.
41. Xie H, Zhou H, Wang H, Chen D, Xia L, Wang T, Yan J. Anti-beta(2)GPI/beta(2)GPI induced TF and TNF-alpha expression in monocytes involving both TLR4/MyD88 and TLR4/TRIF signaling pathways. *Mol Immunol*. 2013 Mar;53(3):246-54.
42. Fan Z, Li C, Qin C, Xie L, Wang X, Gao Z, Qiangbaouzhen, Wang T, Yu L, Liu H. Role of the PI3K/AKT pathway in modulating cytoskeleton rearrangements and phenotype switching in rat pulmonary arterial vascular smooth muscle cells. *DNA Cell Biol*. 2014 Jan;33(1):12-9.

43. Li S, Wang Y, Cao B, Wu Y, Ji L, Li YX, Liu M, Zhao Y, Qiao J, Wang H, Wang H, Han C, Wang YL. Maturation of GDF15 in human placental trophoblast cells depends on the interaction with matrix metalloproteinase-26 (MMP-26). *J Clin Endocrinol Metab.* 2014 Nov; 99(11):E2277-87.
44. Wu D, Sui C, Meng F, Tian X, Fu L, Li Y, Qi X, Cui H, Liu Y, Jiang Y. Stable knockdown of protein kinase CK2-alpha (CK2 α) inhibits migration and invasion and induces inactivation of hedgehog signaling pathway in hepatocellular carcinoma Hep G2 cells. *Acta Histochem.* 2014 Oct;116(8):1501-8.
45. Li C, Yang X, Chen C, Cai S, Hu J. Isorhamnetin suppresses colon cancer cell growth through the PI3K Akt mTOR pathway. *Mol Med Rep.* 2014 Mar;9(3):935-40.
46. Liu S, Zhang E, Yang M, Lu L. Overexpression of Wnt11 promotes chondrogenic differentiation of bone marrow-derived mesenchymal stem cells in synergism with TGF- β . *Mol Cell Biochem.* 2014 May;390(1-2):123-31.
47. Li JX, Feng JM, Wang Y, Li XH, Chen XX, Su Y, Shen YY, Chen Y, Xiong B, Yang CH, Ding J, Miao ZH. The B-Raf(V600E) inhibitor dabrafenib selectively inhibits RIP3 and alleviates acetaminophen-induced liver injury. *Cell Death Dis.* 2014 Jun 5;5:e1278.
48. Zhang F, Yang B, Shi S, Jiang X. RNA interference (RNAi) mediated stable knockdown of protein casein kinase 2-alpha (CK2 α) inhibits migration and invasion and enhances cisplatin-induced apoptosis in HEP-2 laryngeal carcinoma cells. *Acta Histochem.* 2014 Jul;116(6):1000-6.
49. Huang Y, Chen YH, Wang Z, Wang W, Ren Q. Novel myeloid differentiation factor 88, EsMyD88, exhibits EsTube-binding activity in Chinese mitten crab *Eriocheir sinensis*. *Dev Comp Immunol.* 2014 Dec;47(2):298-308.
50. Lin Y, Lin L, Wang Q, Jin Y, Zhang Y, Cao Y, Zheng C. Transplantation of human umbilical mesenchymal stem cells attenuates dextran sulfate sodium-induced colitis in mice. *Clin Exp Pharmacol Physiol.* 2015 Jan;42(1):76-86.
51. Zhang E, Liu S, Xu Z, Huang S, Tan X, Sun C, Lu L. Pituitary tumor-transforming gene 1 (PTTG1) is overexpressed in oral squamous cell carcinoma (OSCC) and promotes migration, invasion and epithelial-mesenchymal transition (EMT) in SCC15 cells. *Tumour Biol.* 2014 Sep;35(9):8801-11.
52. Huang J, Sun W, Huang H, Ye J, Pan W, Zhong Y, Cheng C, You X, Liu B, Xiong L, Liu S. miR-34a modulates angiotensin II-induced myocardial hypertrophy by direct inhibition of ATG9A expression and autophagic activity. *PLoS One.* 2014 Apr 11;9(4):e94382.
53. Ding ZY, Liang HF, Jin GN, Chen WX, Wang W, Datta PK, Zhang MZ, Zhang B, Chen XP. Smad6 suppresses the growth and self-renewal of hepatic progenitor cells. *J Cell Physiol.* 2014 May;229(5):651-60.
54. Liu Y, Ma S, Wang X, Chang J, Gao J, Shi R, Zhang J, Lu W, Liu Y, Zhao P, Xia Q. Highly efficient multiplex targeted mutagenesis and genomic structure variation in *Bombyx mori* cells using CRISPR/Cas9. *Insect Biochem Mol Biol.* 2014 Jun;49:35-42.
55. He Q, Wen D, Jia Q, Cui C, Wang J, Palli SR, Li S. Heat Shock Protein 83 (Hsp83) Facilitates Methoprene-tolerant (Met) Nuclear Import to Modulate Juvenile Hormone Signaling. *J Biol Chem.* 2014 Oct 3;289(40):27874-85.
56. Tian Y, Guo S, Guo Y, Jian L. Anesthetic Propofol Attenuates Apoptosis, A β Accumulation, and Inflammation Induced by Sevoflurane Through NF- κ B Pathway in Human Neuroglioma Cells. *Cell Mol Neurobiol.* 2015 Aug;35(6):891-8.
57. Gao L, Tang H, He H, Liu J, Mao J, Ji H, Lin H, Wu T. Glycyrrhizic acid alleviates bleomycin-induced pulmonary fibrosis in rats. *Front Pharmacol.* 2015 Oct 1;6:215.
58. Zhong D, Zhao S, He G, Li J, Lang Y, Ye W, Li Y, Jiang C, Li X. Stable knockdown of LRG1 by RNA interference inhibits growth and promotes apoptosis of glioblastoma cells in vitro and in vivo. *Tumour Biol.* 2015 Jun;36(6):4271-8.
59. Wang Y, Jiang Y, Bian C, Dong Y, Ma C, Hu X, Liu Z. Overexpression of Hiwi Inhibits the Cell Growth of Chronic Myeloid Leukemia K562 Cells and Enhances Their Chemosensitivity to Daunomycin. *Cell Biochem Biophys.* 2015 Sep;73(1):129-35.
60. Yang Y, Yang Y, Xie X, Wang Z, Gong W, Zhang H, Li Y, Yu F, Li Z, Mei X. Dual-modified liposomes with a two-photon-sensitive cell penetrating peptide and NGR ligand for siRNA targeting delivery. *Biomaterials.* 2015 Apr;48:84-96.
61. Huang J, Pan W, Ou D, Dai W, Lin Y, Chen Y, Chen X. LC3B, a Protein That Serves as an Autophagic Marker, Modulates Angiotensin II-induced Myocardial Hypertrophy. *J Cardiovasc Pharmacol.* 2015 Dec;66(6):576-83.
62. Jiang Y, Fu R, Zhao J, Wu D, Qiao G, Li R, Zhang J. Effects of ELL-associated factor 2 on ultraviolet radiation-induced cataract formation in mice. *Mol Med Rep.* 2015 Nov;12(5):6605-11.
63. Yang X, Zang W, Xuan X, Wang Z, Liu Z, Wang J, Cui J, Zhao G. miRNA-1207-5p is associated with cancer progression by targeting stomatin-like protein 2 in esophageal carcinoma. *Int J Oncol.* 2015 May;46(5):2163-71.
64. Ni W, Fang Y, Tong L, Tong Z, Yi F, Qiu J, Wang R, Tong X. Girdin regulates the migration and invasion of glioma cells via the PI3K-Akt signaling pathway. *Mol Med Rep.* 2015 Oct;12(4):5086-92.
65. Fang J, Li Y, Zhou K, Hua Y, Wang C, Mu D. Antithetical Regulation of α -Myosin Heavy Chain Between Fetal and Adult Heart Failure Though Shuttling of HDAC5 Regulating YY-1 Function. *Cardiovasc Toxicol.* 2015 Apr;15(2):147-56.
66. Li G, Fu J, Zhao Y, Ji K, Luan T, Zang B. Alpha-Lipoic Acid Exerts Anti-Inflammatory Effects on Lipopolysaccharide-Stimulated Rat Mesangial Cells via Inhibition of Nuclear Factor Kappa B (NF- κ B) Signaling Pathway. *Inflammation.* 2015 Apr;38(2):510-9.
67. Zhang X, Hu W, Wu F, Yuan X, Hu J. Shikonin inhibits TNF- α -induced growth and invasion of rat aortic vascular smooth muscle cells. *Can J Physiol Pharmacol.* 2015 Aug;93(8):615-24.
68. Qian G, Hu B, Zhou D, Xuan Y, Bai L, Duan C. NIFRF, a Novel Ubiquitin Ligase, Inhibits Hepatitis B Virus Replication Through Effect on HBV Core Protein and H3 Histones. *DNA Cell Biol.* 2015 May;34(5):327-32.
69. Deng B, Zhang Y, Zhang S, Wen F, Miao Y, Guo K. MicroRNA-142-3p inhibits cell proliferation and invasion of cervical cancer cells by targeting FZD7. *Tumour Biol.* 2015 Sep;36(10):8065-73.
70. Zhong D, He G, Zhao S, Li J, Lang Y, Ye W, Li Y, Jiang C, Li X. LRG1 modulates invasion and migration of glioma cell lines through TGF- β signaling pathway. *Acta Histochem.* 2015 Jul;117(6):551-8.
71. Sun W, Xie Z, Liu Y, Zhao D, Wu Z, Zhang D, Lv H, Tang S, Jin N, Jiang H, Tan M, Ding J, Luo C, Li J, Huang M, Geng M. JX06 Selectively Inhibits Pyruvate Dehydrogenase Kinase PDK1 by a Covalent Cysteine Modification. *Cancer Res.* 2015 Nov 15;75(22):4923-36.
72. Zhang E, Li Z, Xu Z, Duan W, Sun C, Lu L. Frizzled2 mediates the migration and invasion of human oral squamous cell carcinoma cells through the regulation of the signal transducer and activator of transcription-3 signaling pathway. *Oncol Rep.* 2015 Dec;34(6):3061-7.
73. Jin F, Qiao C, Luan N, Shang T. The expression of the imprinted gene pleckstrin homology-like domain family A member 2 in placental tissues of preeclampsia and its effects on the proliferation, migration and invasion of trophoblast cells JEG-3. *Clin Exp Pharmacol Physiol.* 2015 Nov;42(11):1142-51.
74. Zhang B, He P, Lu Y, Bian X, Yang X, Fu X, Wu Y, Li D. HSF1 Relieves Amyloid- β -Induced Cardiomyocytes Apoptosis. *Cell Biochem Biophys.* 2015 Jun;72(2):579-87.
75. Yang W, Xiao L, Li C, Liu X, Liu M, Shao Q, Wang D, Huang A, He C. TIP30 inhibits oligodendrocyte precursor cell differentiation via cytoplasmic sequestration of OliG. *Glia.* 2015 Apr;63(4):684-98.
76. He H, Tang H, Gao L, Wu Y, Feng Z, Lin H, Wu T. Tanshinone IIA attenuates bleomycin-induced pulmonary fibrosis in rats. *Mol Med Rep.* 2015 Jun;11(6):4190-6.
77. Wang Y, Wang B, Du F, Su X, Sun G, Zhou G, Bian X, Liu N. Epigallocatechin-3-Gallate Attenuates Oxidative Stress and Inflammation in Obstructive Nephropathy via NF- κ B and Nr2f2/HO-1 Signalling Pathway Regulation. *Basic Clin Pharmacol Toxicol.* 2015 Sep;117(3):164-72.
78. Fang J, Li Y, Zhou K, Hua Y, Wang C, Mu D. Antithetical regulation of α -myosin heavy chain between fetal and adult heart failure though shuttling of HDAC5 regulating YY-1 function. *Cardiovasc Toxicol.* 2015 Apr;15(2):147-56.
79. Yan X, Wu L, Li B, Meng X, Dai H, Zheng Y, Fu J. Cyanidin-3-O-glucoside attenuates acute lung injury in sepsis rats. *J Surg Res.* 2015 Dec;199(2):592-600.
80. Wu YH, Ai X, Liu FY, Liang HF, Zhang BX, Chen XP. c-Jun N-terminal kinase inhibitor favors transforming growth factor β to antagonize hepatitis B virus X protein induced cell growth promotion in hepatocellular carcinoma. *Mol Med Rep.* 2016 Feb;13(2):1345-52.
81. Tu Y, Zhang L, Tong L, Wang Y, Zhang S, Wang R, Li L, Wang

- ZEFhd2/swiprosin-1 regulates LPS-induced macrophage recruitment via enhancing actin polymerization and cell migration. *Int Immunopharmacol* . 2018 Feb;55:263-271.
82. Xie CJ,Gu AP,Cai J,Wu Y,Chen RC,Curcumin protects neural cells against ischemic injury in N2a cells and mouse brain with ischemic stroke. *Brain Behav* . 2018 Jan 22;8(2):e00921.
83. Hu W,Zhang S,Shen Y,Yang Q,Epidermal growth factor receptor is a cofactor for transmissible gastroenteritis virus entry. *Virology* . 2018 Jun 4;521:33-43.
84. Song K,Yuan Y,Lin Y,Wang YX,Zhou J,Gai QJ,Zhang L,Mao M,Yao XX,Qin Y,Lu HM,Zhang X,Cui YH,Bian XW,Zhang X,Wang YER,BB3,IGF1R, and TGFBR2 expression correlate with PDGFR expression in glioblastoma and participate in PDGFR inhibitor resistance of glioblastoma cells. *Cancer Res* . 2018 May 1;8(5):792-809. eCollection 2018.
85. Ni E,Zhao L,Yao N,Zhu X,Cao H,Sun S,Zhu W,The PXXP domain is critical for the protective effect of BAG3 in cardiomyocytes. *Clin Exp Pharmacol P* . 2018 Oct 16.
86. Yu S,Yin C,Song K,Li S,Zheng GL,Li LF,Wang J,Li Y,Luo Y,Sun Y,Qiu HJ,Engagement of cellular cholesterol in the life cycle of classical swine fever virus: its potential as an antiviral target. *J Gen Virol* . 2019 Feb;100(2):156-165.

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