

Similar articles for PMID: 33198336

99 results

- 1 **N-Acetylcysteine as Modulator of the Essential Trace Elements Copper and Zinc.**
Wolfram T, Schwarz M, Reuß M, Lossow K, Ost M, Klaus S, Schwerdtle T, Kipp AP.
Antioxidants (Basel). 2020 Nov 12;9(11):1117. doi: 10.3390/antiox9111117.
PMID: 33198336 [Free PMC article](#).
- 2 **Crosstalk of Nrf2 with the Trace Elements Selenium, Iron, Zinc, and Copper.**
Schwarz M, Lossow K, Kopp JF, Schwerdtle T, Kipp AP.
Nutrients. 2019 Sep 5;11(9):2112. doi: 10.3390/nu11092112.
PMID: 31491970 [Free PMC article](#).
- 3 **The effects of copper, manganese and zinc on plant growth and elemental accumulation in the manganese-hyperaccumulator *Phytolacca americana*.**
Zhao H, Wu L, Chai T, Zhang Y, Tan J, Ma S.
J Plant Physiol. 2012 Sep 1;169(13):1243-52. doi: 10.1016/j.jplph.2012.04.016. Epub 2012 Jul 12.
PMID: 22796009
- 4 **Does N-acetylcysteine increase the excretion of trace metals (calcium, magnesium, iron, zinc and copper) when given orally?**
Hjortsø E, Fomsgaard JS, Fogh-Andersen N.
Eur J Clin Pharmacol. 1990;39(1):29-31. doi: 10.1007/BF02657052.
PMID: 2276385
- 5 **Copper and zinc differentially affect root glutathione accumulation and phytochelatin synthase gene expression of *Rhizophora mucronata* seedlings: Implications for mechanisms underlying trace metal tolerance.**
Nualla-Ong A, Phongdara A, Buapet P.
Ecotoxicol Environ Saf. 2020 Dec 1;205:111175. doi: 10.1016/j.ecoenv.2020.111175. Epub 2020 Aug 21.
PMID: 32836161 [Free article](#).
- 6 **N-acetylcysteine protects against liver injure induced by carbon tetrachloride via activation of the Nrf2/HO-1 pathway.**
Cai Z, Lou Q, Wang F, Li E, Sun J, Fang H, Xi J, Ju L.
Int J Clin Exp Pathol. 2015 Jul 1;8(7):8655-62. eCollection 2015.
PMID: 26339453 [Free PMC article](#).
- 7 **N-acetylcysteine attenuates intrauterine growth retardation-induced hepatic damage in suckling piglets by improving glutathione synthesis and cellular homeostasis.**
Zhang H, Su W, Ying Z, Chen Y, Zhou L, Li Y, Zhang J, Zhang L, Wang T.
Eur J Nutr. 2018 Feb;57(1):327-338. doi: 10.1007/s00394-016-1322-x. Epub 2016 Oct 8.
PMID: 27722780
- 8 **N-acetylcysteine attenuates phosgene-induced acute lung injury via up-regulation of Nrf2 expression.**
Ji L, Liu R, Zhang XD, Chen HL, Bai H, Wang X, Zhao HL, Liang X, Hai CX.
Inhal Toxicol. 2010 Jun;22(7):535-42. doi: 10.3109/08958370903525183.
PMID: 20384467
- 9 **Protective effects of zinc and N-acetyl-L-cysteine supplementation against cadmium induced erythrocyte cytotoxicity in Arbor Acres broiler chickens (*Gallus gallus domesticus*).**
Zhang D, Li Y, Zhang T, Liu J, Jahejo AR, Yang L, Chen P, Ning G, Huo N, Ma H, Yan F, Tian W.
Ecotoxicol Environ Saf. 2018 Nov 15;163:331-339. doi: 10.1016/j.ecoenv.2018.07.069. Epub 2018 Jul 27.
PMID: 30059877

- 10 Serum and whole blood Zn, Cu and Mn profiles and their relation to redox status in lung cancer patients.
Zabłocka-Słowińska K, Płaczkowska S, Prescha A, Pawełczyk K, Porębska I, Kosacka M, Pawlik-Sobecka L, Grajeta H.
J Trace Elem Med Biol. 2018 Jan;45:78-84. doi: 10.1016/j.jtemb.2017.09.024. Epub 2017 Sep 28.
PMID: 29173487
- 11 Cellular response of antioxidant metalloproteins in Cu/Zn SOD transgenic mice exposed to hyperoxia.
Levy MA, Tsai YH, Reaume A, Bray TM.
Am J Physiol Lung Cell Mol Physiol. 2001 Jul;281(1):L172-82. doi: 10.1152/ajplung.2001.281.1.L172.
PMID: 11404260 [Free article](#).
- 12 Thyroid hormone administration induces rat liver Nrf2 activation: suppression by N-acetylcysteine pretreatment.
Romanque P, Cornejo P, Valdés S, Videla LA.
Thyroid. 2011 Jun;21(6):655-62. doi: 10.1089/thy.2010.0322. Epub 2011 May 12.
PMID: 21563917
- 13 Alterations of serum selenium, zinc, copper, and iron concentrations and some related antioxidant enzyme activities in patients with cutaneous leishmaniasis.
Kocyigit A, Erel O, Gurel MS, Avci S, Aktepe N.
Biol Trace Elem Res. 1998 Dec;65(3):271-81. doi: 10.1007/BF02789102.
PMID: 9892499 [Clinical Trial](#).
- 14 Zinc might prevent heat-induced hepatic injury by activating the Nrf2-antioxidant in mice.
Wang F, Li Y, Cao Y, Li C.
Biol Trace Elem Res. 2015 May;165(1):86-95. doi: 10.1007/s12011-015-0228-4. Epub 2015 Jan 14.
PMID: 25586622
- 15 [N-acetylcysteine: a functional oxygen radical scavenger in vitro and ex vivo in monocytes and neutrophilic granulocytes of patients with COPD].
Jaworska M, Gillissen A, Schärling B, Wickenburg D, Schultze-Werninghaus G.
Pneumologie. 1995 Oct;49(10):539-45.
PMID: 8584524 [German](#).
- 16 Role of Cu/Zn-superoxide dismutase in xenobiotic activation. II. Biological effects resulting from the Cu/Zn-superoxide dismutase-accelerated oxidation of the benzene metabolite 1,4-hydroquinone.
Li Y, Kuppusamy P, Zweir JL, Trush MA.
Mol Pharmacol. 1996 Mar;49(3):412-21.
PMID: 8643080
- 17 Nrf2 deficiency induces oxidative stress and promotes RANKL-induced osteoclast differentiation.
Hyeon S, Lee H, Yang Y, Jeong W.
Free Radic Biol Med. 2013 Dec;65:789-799. doi: 10.1016/j.freeradbiomed.2013.08.005. Epub 2013 Aug 14.
PMID: 23954472
- 18 Effects of N-acetylcysteine, deferoxamine and selenium on doxorubicin-induced hepatotoxicity.
Bulucu F, Ocal R, Karadurmus N, Sahin M, Kenar L, Aydin A, Oktenli C, Koc B, Inal V, Yamanel L, Yaman H.
Biol Trace Elem Res. 2009 Dec;132(1-3):184-96. doi: 10.1007/s12011-009-8377-y.
PMID: 19396405
- 19 Cadmium turnover and changes of zinc and copper body status of rats continuously exposed to cadmium and ethanol.
Brzóska MM, Moniuszko-Jakoniuk J, Jurczuk M, Gałazyn-Sidorczuk M.
Alcohol Alcohol. 2002 May-Jun;37(3):213-21. doi: 10.1093/alcalc/37.3.213.
PMID: 12003907
- 20 Nacystelyn, a novel lysine salt of N-acetylcysteine, to augment cellular antioxidant defence in vitro.
Gillissen A, Jaworska M, Orth M, Coffiner M, Maes P, App EM, Cantin AM, Schultze-Werninghaus G.
Respir Med. 1997 Mar;91(3):159-68. doi: 10.1016/s0954-6111(97)90052-4.

- PMID: 9135855 [Free article](#).
- 21 Contribution of glutathione and metallothioneins to protection against copper toxicity and redox cycling: quantitative analysis using MT^{+/+} and MT^{-/-} mouse lung fibroblast cells.
Jiang J, St Croix CM, Sussman N, Zhao Q, Pitt BR, Kagan VE.
Chem Res Toxicol. 2002 Aug;15(8):1080-7. doi: 10.1021/tx020022u.
PMID: 12184792
- 22 Increased metal tolerance in *Salix* by nicotinamide and nicotinic acid.
Ohlsson AB, Landberg T, Berglund T, Greger M.
Plant Physiol Biochem. 2008 Jul;46(7):655-64. doi: 10.1016/j.plaphy.2008.04.004. Epub 2008 Apr 22.
PMID: 18524611
- 23 [Effect of copper intake and copper-zinc ratio on rat lipid peroxidation in copper deficiency].
Duan L, Cheng Y, Jin Y.
Wei Sheng Yan Jiu. 2010 Jan;39(1):25-8.
PMID: 20364581 Chinese.
- 24 The effect of N-acetylcysteine on the levels of copper, zinc and expression of matrix metalloproteinases in the liver.
Jaafarzadeh MM, Ranji N, Aboutaleb E.
Pol J Vet Sci. 2021 Jun;24(2):191-199. doi: 10.24425/pjvs.2020.135816.
PMID: 34250770
- 25 The manganese-salen compound EUK-134 and N-acetyl cysteine rescue from zinc- and paraquat-induced toxicity in rat polymorphonuclear leukocytes.
Kumar A, Shukla S, Chauhan AK, Singh D, Pandey HP, Singh C.
Chem Biol Interact. 2015 Apr 25;231:18-26. doi: 10.1016/j.cbi.2015.02.012. Epub 2015 Feb 24.
PMID: 25724285
- 26 Multidrug resistance-associated protein 1 mediates 15-deoxy-Δ(12,14)-prostaglandin J2-induced expression of glutamate cysteine ligase expression via Nrf2 signaling in human breast cancer cells.
Song NY, Kim DH, Kim EH, Na HK, Kim NJ, Suh YG, Surh YJ.
Chem Res Toxicol. 2011 Aug 15;24(8):1231-41. doi: 10.1021/tx200090n. Epub 2011 Jul 25.
PMID: 21728338
- 27 Antioxidant enzymes activity and lipid peroxidation in liver and kidney of rats exposed to cadmium and ethanol.
Jurczuk M, Brzóska MM, Moniuszko-Jakoniuk J, Gałazyn-Sidorczuk M, Kulikowska-Karpińska E.
Food Chem Toxicol. 2004 Mar;42(3):429-38. doi: 10.1016/j.fct.2003.10.005.
PMID: 14871584
- 28 The toxicity redox mechanisms of cadmium alone or together with copper and zinc homeostasis alteration: its redox biomarkers.
Nzengue Y, Candéias SM, Sauvaigo S, Douki T, Favier A, Rachidi W, Guiraud P.
J Trace Elem Med Biol. 2011 Jul;25(3):171-80. doi: 10.1016/j.jtemb.2011.06.002. Epub 2011 Aug 5.
PMID: 21820296 Review.
- 29 Trace metal concentrations in post-hatching cuttlefish *Sepia officinalis* and consequences of dissolved zinc exposure.
Le Pabic C, Caplat C, Lehodey JP, Milinkovitch T, Koueta N, Cosson RP, Bustamante P.
Aquat Toxicol. 2015 Feb;159:23-35. doi: 10.1016/j.aquatox.2014.11.012. Epub 2014 Nov 28.
PMID: 25500620 [Free article](#).
- 30 Intravenous Administration of Stable-Labeled N-Acetylcysteine Demonstrates an Indirect Mechanism for Boosting Glutathione and Improving Redox Status.
Zhou J, Coles LD, Kartha RV, Nash N, Mishra U, Lund TC, Cloyd JC.
J Pharm Sci. 2015 Aug;104(8):2619-26. doi: 10.1002/jps.24482. Epub 2015 Jun 5.
PMID: 26052837

- 31 [Levels of Cu, Zn, Se and their relation to levels of ceruloplasmin and the activity of antioxidative enzymes].
Magálová T, Beno I, Brtková A, Mekinová D, Volkovová K, Staruchová M, Tatara M.
Bratisl Lek Listy. 1997 Jan;98(1):8-11.
PMID: 9264806 Slovak.
- 32 Serum zinc, copper, zinc-to-copper ratio, and other essential elements and minerals in children with attention deficit/hyperactivity disorder (ADHD).
Skalny AV, Mazaletskaya AL, Ajsvakova OP, Bjørklund G, Skalnaya MG, Chao JC, Chernova LN, Shakieva RA, Kopylov PY, Skalny AA, Tinkov AA.
J Trace Elem Med Biol. 2020 Mar;58:126445. doi: 10.1016/j.jtemb.2019.126445. Epub 2019 Dec 6.
PMID: 31869738
- 33 The relation between selenium, zinc and copper concentration and the trace element dependent antioxidative status.
Rükgauer M, Neugebauer RJ, Plecko T.
J Trace Elem Med Biol. 2001;15(2-3):73-8. doi: 10.1016/S0946-672X(01)80046-8.
PMID: 11787990
- 34 Levels of selenium, zinc, copper, and antioxidant enzyme activity in patients with leukemia.
Zuo XL, Chen JM, Zhou X, Li XZ, Mei GY.
Biol Trace Elem Res. 2006 Winter;114(1-3):41-53. doi: 10.1385/BTER:114:1:41.
PMID: 17205986
- 35 Chronic effects of copper and zinc on the fish, *Etroplus suratensis* (Bloch, 1790) by continuous flow through (CFT) bioassay.
Don Xavier ND, Bijoy Nandan S, Jayachandran PR, Anu PR, Midhun AM, Mohan D.
Mar Environ Res. 2019 Jan;143:141-157. doi: 10.1016/j.marenvres.2018.11.002. Epub 2018 Nov 13.
PMID: 30497666
- 36 Copper to Zinc Ratio as Disease Biomarker in Neonates with Early-Onset Congenital Infections.
Wisniewska M, Cremer M, Wiehe L, Becker NP, Rijntjes E, Martitz J, Renko K, Bührer C, Schomburg L.
Nutrients. 2017 Mar 30;9(4):343. doi: 10.3390/nu9040343.
PMID: 28358335 Free PMC article.
- 37 Antioxidants activities and concentration of selenium, zinc and copper in preterm and IUGR human placentas.
Zadrożna M, Gawlik M, Nowak B, Marcinek A, Mrówiec H, Walas S, Wietecha-Posłuszny R, Zagrodzki P.
J Trace Elem Med Biol. 2009;23(2):144-8. doi: 10.1016/j.jtemb.2009.02.005. Epub 2009 Apr 2.
PMID: 19398063
- 38 Accumulation of copper in the kidney of pigs fed high dietary zinc is due to metallothionein expression with minor effects on genes involved in copper metabolism.
Zetzsche A, Schunter N, Zentek J, Pieper R.
J Trace Elem Med Biol. 2016 May;35:1-6. doi: 10.1016/j.jtemb.2016.01.006. Epub 2016 Jan 15.
PMID: 27049121
- 39 N-acetylcysteine protects murine alveolar type II cells from cigarette smoke injury in a nuclear erythroid 2-related factor-2-independent manner.
Messier EM, Day BJ, Bahmed K, Kleeberger SR, Tuder RM, Bowler RP, Chu HW, Mason RJ, Kosmider B.
Am J Respir Cell Mol Biol. 2013 May;48(5):559-67. doi: 10.1165/rcmb.2012-0295OC.
PMID: 23492188 Free PMC article.
- 40 Apoptosis induced by chelation of intracellular zinc is associated with depletion of cellular reduced glutathione level in rat hepatocytes.
Nakatani T, Tawaramoto M, Opare Kennedy D, Kojima A, Matsui-Yuasa I.
Chem Biol Interact. 2000 Mar 15;125(3):151-63. doi: 10.1016/s0009-2797(99)00166-0.
PMID: 10731516
- 41 Change of redox status and modulation by thiol replenishment in retinal photooxidative damage.

- Tanito M, Nishiyama A, Tanaka T, Masutani H, Nakamura H, Yodoi J, Ohira A.
Invest Ophthalmol Vis Sci. 2002 Jul;43(7):2392-400.
PMID: 12091442
- 42 **Copper/zinc and copper/selenium ratios, and oxidative stress as biochemical markers in recurrent aphthous stomatitis.**
Ozturk P, Belge Kurutas E, Ataseven A.
J Trace Elem Med Biol. 2013 Oct;27(4):312-6. doi: 10.1016/j.jtemb.2013.04.002. Epub 2013 Apr 12.
PMID: 23664921
- 43 **Waterborne zinc induced lobe-dependent effect on oxidative stress and energy metabolism in hepatopancreas of Larimichthys crocea.**
Zheng JL, Peng LB, Zhu QL, Zhang XL, Hu W.
Aquat Toxicol. 2019 Oct;215:105270. doi: 10.1016/j.aquatox.2019.105270. Epub 2019 Aug 5.
PMID: 31401473
- 44 **Oxidative stress induced by cadmium in the C6 cell line: role of copper and zinc.**
Nzengue Y, Steiman R, Rachidi W, Favier A, Guiraud P.
Biol Trace Elem Res. 2012 Jun;146(3):410-9. doi: 10.1007/s12011-011-9265-9. Epub 2011 Nov 30.
PMID: 22127830
- 45 **Antioxidant defenses at transcriptional and enzymatic levels and gene expression of Nrf2-Keap1 signaling molecules in response to acute zinc exposure in the spleen of the large yellow croaker Pseudosciaena crocea.**
Zheng JL, Zeng L, Shen B, Xu MY, Zhu AY, Wu CW.
Fish Shellfish Immunol. 2016 May;52:1-8. doi: 10.1016/j.fsi.2016.02.031. Epub 2016 Mar 3.
PMID: 26940795
- 46 **Oxidative stress biomarkers in the digestive gland of Theba pisana exposed to heavy metals.**
Radwan MA, El-Gendy KS, Gad AF.
Arch Environ Contam Toxicol. 2010 Apr;58(3):828-35. doi: 10.1007/s00244-009-9380-1. Epub 2009 Aug 25.
PMID: 19705050
- 47 **Analyzed dietary intakes, plasma concentrations of zinc, copper, and selenium, and related antioxidant enzyme activities in hospitalized elderly women.**
Schmuck A, Roussel AM, Arnaud J, Ducros V, Favier A, Franco A.
J Am Coll Nutr. 1996 Oct;15(5):462-8. doi: 10.1080/07315724.1996.10718625.
PMID: 8892172
- 48 **N-acetylcysteine stimulates protein synthesis in enterocytes independently of glutathione synthesis.**
Yi D, Hou Y, Wang L, Long M, Hu S, Mei H, Yan L, Hu CA, Wu G.
Amino Acids. 2016 Feb;48(2):523-33. doi: 10.1007/s00726-015-2105-z. Epub 2015 Oct 3.
PMID: 26433892
- 49 **Protective effect of N-acetylcysteine against fetal death and preterm labor induced by maternal inflammation.**
Buhimschi IA, Buhimschi CS, Weiner CP.
Am J Obstet Gynecol. 2003 Jan;188(1):203-8. doi: 10.1067/mob.2003.112.
PMID: 12548218
- 50 **Protective effect of magnesium acetyltaurate against NMDA-induced retinal damage involves restoration of minerals and trace elements homeostasis.**
Jafri AJA, Arfuzir NNN, Lambuk L, Iezhitsa I, Agarwal R, Agarwal P, Razali N, Krasilnikova A, Kharitonova M, Demidov V, Serebryansky E, Skalny A, Spasov A, Yusof APM, Ismail NM.
J Trace Elem Med Biol. 2017 Jan;39:147-154. doi: 10.1016/j.jtemb.2016.09.005. Epub 2016 Sep 17.
PMID: 27908408
- 51 **N-acetylcysteine and endothelial cell injury by sulfur mustard.**
Atkins KB, Lodhi IJ, Hurley LL, Hinshaw DB.

- J Appl Toxicol. 2000 Dec;20 Suppl 1:S125-8. doi: 10.1002/1099-1263(200012)20:1+<::aid-jat671>3.0.co;2-u.
PMID: 11428622 [Free article.](#)
- 52 **Antidiabetic zinc(II)-N-acetyl-L-cysteine complex: evaluations of in vitro insulinomimetic and in vivo blood glucose-lowering activities.**
Adachi Y, Yoshikawa Y, Sakurai H.
Biofactors. 2007;29(4):213-23. doi: 10.1002/biof.5520290405.
PMID: 18057552
- 53 **Homeostatic changes of some trace elements in geriatric rats in the condition of oxidative stress induced by aluminum and the beneficial role of resveratrol.**
Muselin F, Gârban Z, Cristina RT, Doma AO, Dumitrescu E, Vițălaru AB, Bănățean-Dunea I.
J Trace Elem Med Biol. 2019 Sep;55:136-142. doi: 10.1016/j.jtemb.2019.06.013. Epub 2019 Jun 27.
PMID: 31345351 [Free article.](#)
- 54 **Interaction between copper and zinc in metal accumulation in rats with particular reference to the synthesis of induced-metallothionein.**
Irato P, Albergoni V.
Chem Biol Interact. 2005 Aug 15;155(3):155-64. doi: 10.1016/j.cbi.2005.06.005.
PMID: 16083871
- 55 **Zinc ameliorates copper-induced oxidative stress in developing rice (*Oryza sativa L.*) seedlings.**
Thounaojam TC, Panda P, Choudhury S, Patra HK, Panda SK.
Protoplasma. 2014 Jan;251(1):61-9. doi: 10.1007/s00709-013-0525-8. Epub 2013 Jul 7.
PMID: 23832522
- 56 **Bilirubin mediated oxidative stress involves antioxidant response activation via Nrf2 pathway.**
Qaisiya M, Coda Zabetta CD, Bellarosa C, Tiribelli C.
Cell Signal. 2014 Mar;26(3):512-20. doi: 10.1016/j.cellsig.2013.11.029. Epub 2013 Dec 2.
PMID: 24308969
- 57 **Effects of dietary N-acetylcysteine on the oxidative stress induced in tilapia (*Oreochromis niloticus*) exposed to a microcystin-producing cyanobacterial water bloom.**
Puerto M, Prieto AI, Richardo S, Moreno I, Jos A, Moyano R, Cameán AM.
Environ Toxicol Chem. 2009 Aug;28(8):1679-86. doi: 10.1897/08-520.1. Epub 2009 Mar 16.
PMID: 19290682
- 58 **Existing and potential therapeutic uses for N-acetylcysteine: the need for conversion to intracellular glutathione for antioxidant benefits.**
Rushworth GF, Megson IL.
Pharmacol Ther. 2014 Feb;141(2):150-9. doi: 10.1016/j.pharmthera.2013.09.006. Epub 2013 Sep 28.
PMID: 24080471 Review.
- 59 **Distinct mechanisms for N-acetylcysteine inhibition of cytokine-induced E-selectin and VCAM-1 expression.**
Faruqi RM, Poptic EJ, Faruqi TR, De La Motte C, DiCorleto PE.
Am J Physiol. 1997 Aug;273(2 Pt 2):H817-26. doi: 10.1152/ajpheart.1997.273.2.H817.
PMID: 9277499
- 60 **Decrease in gamma-glutamyltransferase activity in rat type II cells exposed in vitro to hyperoxia: effects of the 21-aminosteroid U-74389G.**
van Klaveren RJ, Pype JL, Demedts M, Nemery B.
Exp Lung Res. 1997 Jul-Aug;23(4):347-59. doi: 10.3109/01902149709039231.
PMID: 9202959
- 61 **Change of zinc, copper, and metallothionein concentrations and the copper-zinc superoxide dismutase activity in patients with pancreatitis.**

- Milnerowicz H, Jabłonowska M, Bizon A.
Pancreas. 2009 Aug;38(6):681-8. doi: 10.1097/MPA.0b013e3181a53d1.
PMID: 19629005
- 62 **Effect of copper- and zinc-methionine supplementation on bioavailability, mineral status and tissue concentrations of copper and zinc in ewes.**
Pal DT, Gowda NK, Prasad CS, Amarnath R, Bharadwaj U, Suresh Babu G, Sampath KT.
J Trace Elem Med Biol. 2010 Apr;24(2):89-94. doi: 10.1016/j.jtemb.2009.11.007. Epub 2010 Jan 13.
PMID: 20413065
- 63 **The influence of metallothionein on exposure to metals: an in vitro study on cellular models.**
Santon A, Formigari A, Irato P.
Toxicol In Vitro. 2008 Jun;22(4):980-7. doi: 10.1016/j.tiv.2008.02.002. Epub 2008 Feb 13.
PMID: 18356017
- 64 **Comparative trace mineral nutritional balance of first-litter gilts under two dietary levels of copper intake.**
Cao J, Chavez ER.
J Trace Elem Med Biol. 1995 Jul;9(2):102-11. doi: 10.1016/S0946-672X(11)80018-0.
PMID: 8825983
- 65 **Effect of dietary caffeine and zinc on the activity of antioxidant enzymes, zinc, and copper concentration of the heart and liver in fast-growing rats.**
Rossowska MJ, Ghanaei P, Nakamoto T.
Biol Trace Elem Res. 1995 Dec;50(3):229-36. doi: 10.1007/BF02785413.
PMID: 8962794
- 66 **Redox activation of DUSP4 by N-acetylcysteine protects endothelial cells from Cd²⁺-induced apoptosis.**
Barajas-Espinosa A, Basye A, Jesse E, Yan H, Quan D, Chen CA.
Free Radic Biol Med. 2014 Sep;74:188-199. doi: 10.1016/j.freeradbimed.2014.06.016. Epub 2014 Jun 26.
PMID: 24973647 [Free PMC article.](#)
- 67 **N-acetylcysteine and glutathione as inhibitors of tumor necrosis factor production.**
Peristeris P, Clark BD, Gatti S, Faggioni R, Mantovani A, Mengozzi M, Orencole SF, Sironi M, Ghezzi P.
Cell Immunol. 1992 Apr;140(2):390-9. doi: 10.1016/0008-8749(92)90205-4.
PMID: 1544168
- 68 **Protective effects of N-acetylcysteine on the peroxidative changes of rat lungs exposed to inhalation of thinners.**
Dillioglugil MO, Ilgazli A, Maral H, Sengul C, Ozdemir G, Ercin C.
Respirology. 2005 Nov;10(5):615-9. doi: 10.1111/j.1440-1843.2005.00758.x.
PMID: 16268915
- 69 **Acetylcholinesterase inhibitors in Alzheimer's disease influence Zinc and Copper homeostasis.**
Giacconi R, Giuli C, Casoli T, Balietti M, Costarelli L, Provinciali M, Basso A, Piacenza F, Postacchini D, Galeazzi R, Fattoretti P, Nisi L, Fabbietti P, Papa R, Malavolta M.
J Trace Elem Med Biol. 2019 Sep;55:58-63. doi: 10.1016/j.jtemb.2019.06.001. Epub 2019 Jun 5.
PMID: 31345366
- 70 **Curcumin mediates time and concentration dependent regulation of redox homeostasis leading to cytotoxicity in macrophage cells.**
Kunwar A, Sandur SK, Krishna M, Priyadarsini KI.
Eur J Pharmacol. 2009 Jun 2;611(1-3):8-16. doi: 10.1016/j.ejphar.2009.03.060. Epub 2009 Apr 1.
PMID: 19344704
- 71 **N-acetyl-L-cysteine protects against cadmium-induced neuronal apoptosis by inhibiting ROS-dependent activation of Akt/mTOR pathway in mouse brain.**
Chen S, Ren Q, Zhang J, Ye Y, Zhang Z, Xu Y, Guo M, Ji H, Xu C, Gu C, Gao W, Huang S, Chen L.

- Neuropathol Appl Neurobiol. 2014 Oct;40(6):759-77. doi: 10.1111/nan.12103.
PMID: 24299490 [Free PMC article.](#)
- 72 Regulation of metal homeostasis and zinc transporters in early-life stage zebrafish following sublethal waterborne zinc exposure.
Puar P, Niyogi S, Kwong RWM.
Aquat Toxicol. 2020 Aug;225:105524. doi: 10.1016/j.aquatox.2020.105524. Epub 2020 Jun 15.
PMID: 32610223
- 73 Daily dietary intake of copper, zinc, and selenium of exclusively breast-fed infants of middle-class women in Burundi, Africa.
Robberecht H, Benemariya H, Deelstra H.
Biol Trace Elem Res. 1995 Aug-Sep;49(2-3):151-9. doi: 10.1007/BF02788964.
PMID: 8562283
- 74 Comparative study of zinc, copper, manganese, and iron concentrations in organs of zinc-deficient rats and rats treated neonatally with L-monosodium glutamate.
Sakai T, Miki F, Wariishi M, Yamamoto S.
Biol Trace Elem Res. 2004 Feb;97(2):163-82. doi: 10.1385/BTER:97:2:163.
PMID: 14985626
- 75 Effects of N-acetylcysteine on alcohol abstinence and alcohol-induced adverse effects in rats.
Ferreira Seiva FR, Amauchi JF, Ribeiro Rocha KK, Souza GA, Ebaid GX, Burneiko RM, Novelli EL.
Alcohol. 2009 Mar;43(2):127-35. doi: 10.1016/j.alcohol.2008.12.003.
PMID: 19251114
- 76 [The protective effect of N-acetylcysteine on acute lung injury induced by PFIB inhalation].
Yang LM, Zhao J, Wang HT, Xu XX, Jliao YM, Ding RG.
Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2017 Jul 20;35(7):481-486. doi: 10.3760/cma.j.issn.1001-9391.2017.07.001.
PMID: 29081093 Chinese.
- 77 Metabolic, desmutagenic and anticarcinogenic effects of N-acetylcysteine.
De Flora S, Rossi GA, De Flora A.
Respiration. 1986;50 Suppl 1:43-9. doi: 10.1159/000195087.
PMID: 3809742
- 78 N-acetylcysteine alleviates H₂O₂-induced damage via regulating the redox status of intracellular antioxidants in H9c2 cells.
Liu X, Wang L, Cai J, Liu K, Liu M, Wang H, Zhang H.
Int J Mol Med. 2019 Jan;43(1):199-208. doi: 10.3892/ijmm.2018.3962. Epub 2018 Oct 29.
PMID: 30387809 [Free PMC article.](#)
- 79 Effect of dietary trace mineral concentration and source (inorganic vs. chelated) on performance, mineral status, and fecal mineral excretion in pigs from weaning through finishing.
Creech BL, Spears JW, Flowers WL, Hill GM, Lloyd KE, Armstrong TA, Engle TE.
J Anim Sci. 2004 Jul;82(7):2140-7. doi: 10.2527/2004.8272140x.
PMID: 15309962
- 80 Effects of dietary zinc, iron, and copper in layer feed on distribution of these elements in eggs, liver, excreta, soil, and herbage.
Skrivan M, Skrivanová V, Marounek M.
Poult Sci. 2005 Oct;84(10):1570-5. doi: 10.1093/ps/84.10.1570.
PMID: 16335126 [Free article.](#) Clinical Trial.
- 81 Dietary copper primarily affects antioxidant capacity and dietary iron mainly affects iron status in a surface response study of female rats fed varying concentrations of iron, zinc and copper.

- Roughead ZK, Johnson LK, Hunt JR.
J Nutr. 1999 Jul;129(7):1368-76. doi: 10.1093/jn/129.7.1368.
PMID: 10395600
- 82 **Tissue-specific effects of fenthion on glutathione metabolism modulated by NAC and BSO in Oreochromis niloticus.**
Sevgiler Y, Uner N.
Drug Chem Toxicol. 2010 Oct;33(4):348-56. doi: 10.3109/01480541003734048.
PMID: 20550428
- 83 **Cytoprotective Effects of N-Acetylcysteine on Streptozotocin- Induced Oxidative Stress and Apoptosis in RIN-5F Pancreatic β -Cells.**
Al-Nahdi AMT, John A, Raza H.
Cell Physiol Biochem. 2018;51(1):201-216. doi: 10.1159/000495200. Epub 2018 Nov 16.
PMID: 30448838 [Free article](#).
- 84 **Effects of binary metal combinations on zinc, copper, cadmium and lead uptake and distribution in Brassica juncea.**
Kutrowska A, Małecka A, Piechalak A, Masiakowski W, Hanć A, Barałkiewicz D, Andrzejewska B, Zbierska J, Tomaszewska B.
J Trace Elem Med Biol. 2017 Dec;44:32-39. doi: 10.1016/j.jtemb.2017.05.007. Epub 2017 May 27.
PMID: 28965594
- 85 **Disulfiram targeting lymphoid malignant cell lines via ROS-JNK activation as well as Nrf2 and NF- κ B pathway inhibition.**
Zha J, Chen F, Dong H, Shi P, Yao Y, Zhang Y, Li R, Wang S, Li P, Wang W, Xu B.
J Transl Med. 2014 Jun 11;12:163. doi: 10.1186/1479-5876-12-163.
PMID: 24915933 [Free PMC article](#).
- 86 **Maternal and neonatal scalp hair concentrations of zinc, copper, cadmium, and lead: relationship to some lifestyle factors.**
Razagui IB, Ghribi I.
Biol Trace Elem Res. 2005 Jul;106(1):1-28. doi: 10.1385/BTER:106:1:001.
PMID: 16037607
- 87 **Copper exposure induces oxidative injury, disturbs the antioxidant system and changes the Nrf2/ARE (CuZnSOD) signaling in the fish brain: protective effects of myo-inositol.**
Jiang WD, Liu Y, Hu K, Jiang J, Li SH, Feng L, Zhou XQ.
Aquat Toxicol. 2014 Oct;155:301-13. doi: 10.1016/j.aquatox.2014.07.003. Epub 2014 Jul 14.
PMID: 25087001
- 88 **S-allylmercapto-N-acetylcysteine up-regulates cellular glutathione and protects vascular endothelial cells from oxidative stress.**
Izigov N, Farzam N, Savion N.
Free Radic Biol Med. 2011 May 1;50(9):1131-9. doi: 10.1016/j.freeradbiomed.2011.01.028. Epub 2011 Jan 31.
PMID: 21281712
- 89 **Effect of fulvic and humic acids on copper and zinc homeostasis in rats.**
Hullár I, Vučskits AV, Berta E, Andrásófszky E, Bersényi A, Szabó J.
Acta Vet Hung. 2018 Mar;66(1):40-51. doi: 10.1556/004.2018.005.
PMID: 29580088 [Free article](#).
- 90 **The distribution patterns of trace elements in the blood and organs in a rabbit experimental model of copper pollution and study of haematology and biochemistry parameters.**
Shen SG, Li H, Zhao YY, Zhang QY, Sun HW.
Environ Toxicol Pharmacol. 2005 Feb;19(2):379-84. doi: 10.1016/j.etap.2004.09.008.
PMID: 21783499
- 91 **Thiols can either enhance or suppress DNA damage induction by catecholestrogens.**
Thibodeau PA, Kocsis-Bédard S, Courteau J, Niyonsenga T, Paquette B.
Free Radic Biol Med. 2001 Jan 1;30(1):62-73. doi: 10.1016/s0891-5849(00)00446-9.

PMID: 11134896

- 92 **Novel mechanisms of protection against acetaminophen hepatotoxicity in mice by glutathione and N-acetylcysteine.**
Saito C, Zwingmann C, Jaeschke H.
Hepatology. 2010 Jan;51(1):246-54. doi: 10.1002/hep.23267.
PMID: 19821517 [Free PMC article](#).
- 93 **N-Acetylcysteine and Acetylsalicylic Acid Inhibit Alcohol Consumption by Different Mechanisms: Combined Protection.**
Quintanilla ME, Ezquer F, Morales P, Ezquer M, Olivares B, Santapau D, Herrera-Marschitz M, Israel Y.
Front Behav Neurosci. 2020 Jul 31;14:122. doi: 10.3389/fnbeh.2020.00122. eCollection 2020.
PMID: 32848653 [Free PMC article](#).
- 94 **Differential protection of pre- versus post-treatment with curcumin, Trolox, and N-acetylcysteine against acrylonitrile-induced cytotoxicity in primary rat astrocytes.**
Yu B, Changsheng Y, Wenjun Z, Ben L, Hai Q, Jing M, Guangwei X, Shuhua W, Fang L, Aschner M, Rongzhu L.
Neurotoxicology. 2015 Dec;51:58-66. doi: 10.1016/j.neuro.2015.09.011. Epub 2015 Sep 26.
PMID: 26409646
- 95 **Effects of halothane, enflurane, and isoflurane on plasma and erythrocyte antioxidant enzymes and trace elements.**
Türkan H, Bukan N, Sayal A, Aydin A, Bukan MH.
Biol Trace Elem Res. 2004 Winter;102(1-3):105-12. doi: 10.1385/BTER:102:1-3:105.
PMID: 15621932
- 96 **Formation of novel N-acetylcysteine-hemin adducts abrogates hemin-induced cytotoxicity and suppresses the NRF2-driven stress response in human pro-erythroid K562 cells.**
Georgiou-Sifasis SK, Samiotaki MK, Demopoulos VJ, Panayotou G, Tsiftsoglou AS.
Eur J Pharmacol. 2020 Aug 5;880:173077. doi: 10.1016/j.ejphar.2020.173077. Epub 2020 Mar 25.
PMID: 32222495
- 97 **Reactivity of Cu(ii)-, Zn(ii)- and Fe(ii)-thiosemicarbazone complexes with glutathione and metallothionein: from stability to dissociation to transmetallation.**
Santoro A, Vileno B, Palacios Ò, Peris-Díaz MD, Riegel G, Gaiddon C, Krézel A, Faller P.
Metallomics. 2019 May 22;11(5):994-1004. doi: 10.1039/c9mt00061e.
PMID: 31011727
- 98 **Probenecid and N-Acetylcysteine Prevent Loss of Intracellular Glutathione and Inhibit Neuronal Death after Mechanical Stretch Injury In Vitro.**
Du L, Empey PE, Ji J, Chao H, Kochanek PM, Bayır H, Clark RS.
J Neurotrauma. 2016 Oct 15;33(20):1913-1917. doi: 10.1089/neu.2015.4342. Epub 2016 Mar 22.
PMID: 26830358 [Free PMC article](#).
- 99 **Metabolism and tissue distribution of trace elements in broiler chickens' fed diets containing deficient and plethoric levels of copper, manganese, and zinc.**
Mondal S, Haldar S, Saha P, Ghosh TK.
Biol Trace Elem Res. 2010 Nov;137(2):190-205. doi: 10.1007/s12011-009-8570-z. Epub 2009 Nov 28.
PMID: 19946757

FOLLOW NCBI



Follow NLM

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

[Copyright](#)

[FOIA](#)

[Privacy](#)

[Help](#)

[Accessibility](#)

[Careers](#)

[NLM](#) [NIH](#) [HHS](#) [USA.gov](#)