Pomegranate Reference List

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1. Ayurveda supplier, *Pomegranate Peel Powder, Dadam Chal Powder*, Pomegranate-Peel-Powder-Dadam-Chal-Powder
2. WorldWideScience.org, *Pomegranate peel extract*, https://worldwidescience.org/topicpages/p/pomegranate+peel+extract.html
3. U.S. NCCIH, *Pomegranate Fact Sheet*, 57, https://nccih.nih.gov/health/pomegranate/at-a-glance
4. Carol M. Bareuther, *Pomegranates Contain Treasures Inside*, ProduceBusiness.com, Sept. 6, 2019, https://www.producebusiness.com/pomegranates-contain-treasure-inside/
5. Sasha Khokha, *Drought-Stressed Crops May Be Better For You*, KQED Science, kqed.org,Oct. 20, 2014, https://www.kqed.org/science/22666/drought-stressed-crops-may-be-better-for-you
6. V. A. Haby, Marvin L. Baker, and Sam Feagley*, Ch. III: Soils and Fertilizers,* from: ed. Drs. Joe Masabni, Frank Dainello, and Sam Cotner, *Vegetable Growers Handbook, 4th Ed.*, Texas A & M University, Revised Winter 2009, aggie-horticulture.tamu.edu/Guides/Vegetable Resources, https://aggie-horticulture.tamu.edu/vegetable/guides/texas-vegetable-growers-handbook/chapter-iii-soils-fertilizers/
7. *Pomegranate Trials Examine Irrigation Needs of Emerging Crop*, California State University Fresno, California Agricultural Technology Institute, *Update*, Winter 2010-11, fresnostate.edu, http://www.fresnostate.edu/jcast/cati/documents/update/Update-2010-Winter.pdf
8. (deceased) James H. LaRue, DANR Leaflet 2459: 1977, *Growing Pomegranates in California,* Fruit & Nut Research and Information Center, ucce.ucdavis.edu, http://ucce.ucdavis.edu/files/programs/5419/Growing_Pomegranates_in_California.htm
9. 6, (Soliman, et al, 2014) Soliman, I.A, Afify, S.A, Hasanin, F.R, & El Sahy, K.M (2014). Antioxidant Activity of Some Extracts from GAMMA Irradiated Pomegranate (Punica granatum L) Peel and Seed. *Zagazig J of Ag Research*, 41(2), 291-303. https://inis.iaea.org/search/search.aspx?orig_q=RN:46000885
10. 7, (Hadrich, et al, 2014) Hadrich F, Cher S, Gargouri YT, Adel S., Antioxidant and lipase inhibitory activities and essential oil composition of pomegranate peel extracts. *J Oleo Sci*. 2014;63(5):515-25. https://www.ncbi.nlm.nih.gov/pubmed/24770478
11. 10, (Tadi Beni, et al, 2018) Tadi Beni M, Ansari F, Heydari A, Khalili Sadrabad E, Determination of antioxidant activity and phenolic content of ethanolic extract of pomegranate peel, seed and juice., *JBUMS* 2018, 20 - Supplement 1-2018: 0-0 http://jbums.org/browse.php?a_code=A-10-3250-7&slc_lang=en&sid=1
12. 42, (Abid,et al, 2017) Abid M, Yaich H, Cheikhrouhou S, et al., Antioxidant properties and phenolic profile characterization by LC–MS/MS of selected Tunisian pomegranate

peels., *J Food Sci Technol*. 2017 Aug; 54(9): 2890–2901. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5583119/

13. 1, (Qu, et al, 2014) Qu, W., Pan, Z., Breksa III, A.P., Ma, H. 2014. Thermal stability of liquid antioxidative extracts from pomegranate peel. *J of the Sci of Food and Ag*. 2014 94(5):1005-1012. https://www.ars.usda.gov/research/publications/publication/?seqNo115=287597
14. 33, (Qu, et al, 2009) Qu, W., Pan, Z., Ma, H., Chen, X. 2009. Antioxidant Extraction and Biogas Production from Pomegranate Marc. Proceedings of the American Society of Agricultural and Biological Engineers International (ASABE). ASABE Paper #096378. p. 1-19. St. Joseph, Mich. https://www.ars.usda.gov/research/publications/publication/?seqNo115=242377
15. 78, (Oudane, et al, 2018) Oudane B, Boudemagh D, Bounekhel M, et al., Isolation, characterization, antioxidant activity, and protein-precipitating capacity of the hydrolyzable tannin punicalagin from pomegranate yellow peel (Punica granatum)., *J of Molecular Structure*, Volume 1156, p. 390-396., 03/2018 http://adsabs.harvard.edu/abs/2018JMoSt1156..390O
16. 198 , (Jacob, et al, 2018) Jacob J, Lakshmanapermalsamy P, Illuri R, Bhosle D, Sangli GK, Mundkinajeddu D. In vitro Evaluation of Antioxidant Potential of Isolated Compounds and Various Extracts of Peel of Punica granatum L. *Pharmacognosy Res*. 2018;10(1):44–48. doi:10.4103/pr.pr_36_17 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5855372/
17. 29, (Masci, et al, 2016) Masci A, Coccia A, Lendaro E, et al., Evaluation of different extraction methods from pomegranate whole fruit or peels and the antioxidant and antiproliferative activity of the polyphenolic fraction. *Food Chem*. 2016 Jul 1;202:59-69. Doi: 10.1016/j.foodchem.2016.01.106. Epub 2016 Jan 27. https://www.ncbi.nlm.nih.gov/pubmed/26920266
18. 30 , (Serenjeh and Hashemi, 2017) Serenjeh FN, Hashemi P, The Extraction and Determination of Ellagic Acid Content in the Peels of Six Iranian Pomegranates Cultivars Using a New Miniaturized Matrix Solid-Phase Dispersion Method., *Herbal Medicines Journal*, Vol 2, No 1, 2017 http://hmj.lums.ac.ir/index.php/hmj/article/view/575
19. 50, (Garcia-Villalba, et al, 2015) García-Villalba R, Espín JC, Aaby K, et al., Validated Method for the Characterization and Quantification of Extractable and Nonextractable Ellagitannins after Acid Hydrolysis in Pomegranate Fruits, Juices, and Extracts. *J Agric Food Chem*. 2015 Jul 29;63(29):6555-66. doi: 10.1021/acs.jafc.5b02062. Epub 2015 Jul 17. https://www.ncbi.nlm.nih.gov/pubmed/26158321
20. 25, (Zhou, et al, 2013) Zhou Q1, Sun LL, Dai YP, et al.,[Comparative study of chemical composition of pomegranate peel pomegranates inside and pomegranate seeds]. [Article in Chinese], *Zhongguo Zhong Yao Za Zhi*. 2013 Jul;38(13):2159-62. https://www.ncbi.nlm.nih.gov/pubmed/24079246
21. (Long, et al, 2019), Long J, Guo Y, Yang J, et al., *Bioavailability and bioactivity of free ellagic acid compared to pomegranate juice*, Food Funct., 2019, Advance Article, https://pubs.rsc.org/en/content/articlelanding/2019/fo/c9fo01683j#!divAbstract

22. (Ahima, 2008), Ahima RS. Revisiting leptin's role in obesity and weight loss. *J Clin Invest*. 2008;118(7):2380–2383. doi:10.1172/JCI36284 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2430504/
23. (Sharma, et al., 2016), Sharma SP, Chung HJ, Kim HJ, Hong ST. Paradoxical Effects of Fruit on Obesity. *Nutrients*. 2016;8(10):633. Published 2016 Oct 14. doi:10.3390/nu8100633, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5084020/
24. 69, (Mahmoud and Ibrahim, 2013) Mahmoud, K.A., & Ibrahim, G.E. (2013). Antioxidant Activity and the relationship with Panholic Composition in some Egyptian Pomegranate Cultivars. *J of Radiation Research and App Sciences*, 6(1B), 353-368. https://inis.iaea.org/search/search.aspx?orig_q=RN:46055285
25. 15, (Xi, et al, 2017) Xi J, He L, Yan LG, Continuous extraction of phenolic compounds from pomegranate peel using high voltage electrical discharge. *Food Chem*. 2017 Sep 1;230:354-361. doi: 10.1016/j.foodchem.2017.03.072. Epub 2017 Mar 14. https://www.ncbi.nlm.nih.gov/pubmed/28407922
26. 13,(Fawole, et al, 2012) Fawole OA, Makunga NP, Opara UL. Antibacterial, antioxidant and tyrosinase-inhibition activities of pomegranate fruit peel methanolic extract. *BMC Complement Altern Med*. 2012;12:200. Pub 2012 Oct 30. doi:10.1186/1472-6882-12-200 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3527236/?tool=pmcentrez
27. 21, (Young, et al, 2017) Young, J.E., Pan, Z., Teh, H., Menon, V., Modereger, B., Pesek, J.H., Matyska, M.T., Dao, L.T., Takeoka, G.R. 2017. Phenolic composition of pomegranate peel extracts using an LC-MS approach with silica hydride columns. *J of Separation Science*. 2017 40(7)1449-1456. doi:10.1002/jssc.201601310. https://www.ars.usda.gov/research/publications/publication/?seqNo115=332109
28. 4, Qu, W., Breksa III, A.P., Pan, Z., Ma, H., Mchugh, T.H. 2012. Storage stability of sterilized liquid extracts from pomegranate peel. *Journal of Food Science*. 77(7):C765-C772. DOI: 10.1111/j.1750-3841.2012.02779.x. https://www.ars.usda.gov/research/publications/publication/?seqNo115=283642
29. 3, Wang ZY, Zhang LH, Wang YH, et al.,[Mass Transfer Kinetics Model of Ultrasonic Extraction of Pomegranate Peel Polyphenols].[Article in Chinese], *Zhong Yao Cai*. 2015 May;38(5):1060-5. https://www.ncbi.nlm.nih.gov/pubmed/26767301
30. 62, (Rababah, et al, 2010) Rababah TM, Banat F, Rababah A, et al., Optimization of extraction conditions of total phenolics, antioxidant activities, and anthocyanin of oregano, thyme, terebinth, and pomegranate. *J Food Sci*. 2010 Sep;75(7):C626-32. doi: 10.1111/j.1750-3841.2010.01756.x. https://www.ncbi.nlm.nih.gov/pubmed/21535529
31. 77, (Abdulla, et al, 2017) Abdulla R, Mansur S, Lai H, et al., Qualitative Analysis of Polyphenols in Macroporous Resin Pretreated Pomegranate Husk Extract by HPLC-QTOF-MS. *Phytochem Anal*. 2017 Sep;28(5):465-473. doi: 10.1002/pca.2695. Epub 2017 Jun 23. https://www.ncbi.nlm.nih.gov/pubmed/28643853
32. 80, (Akhavan, et al, 2015) Akhavan H, Barzegar M, Weidlich H, and Zimmermann BF, “Phenolic Compounds and Antioxidant Activity of Juices from Ten Iranian Pomegranate Cultivars Depend on Extraction,” *Journal of Chemistry*, vol. 2015, Article ID 907101, 7 pages, 2015. https://doi.org/10.1155/2015/907101. https://www.hindawi.com/journals/jchem/2015/907101/

33. 96, (Boggia, et al, 2016) Boggia, R.; Turrini, F.; Villa, C.; Lacapra, C.; Zunin, P.; Parodi, B. Green Extraction from Pomegranate Marcs for the Production of Functional Foods and Cosmetics. *Pharmaceuticals* 2016, 9, 63. https://www.mdpi.com/1424-8247/9/4/63
34. 128, (Brighenti, et al, 2017) Brighenti V, Groothuis SF, Prencipe FP, et al., Metabolite fingerprinting of Punica granatum L. (pomegranate) polyphenols by means of high-performance liquid chromatography with diode array and electrospray ionization-mass spectrometry detection. *J Chromatogr A*. 2017 Jan 13;1480:20-31. doi: 10.1016/j.chroma.2016.12.017. Epub 2016 Dec 10. https://www.ncbi.nlm.nih.gov/pubmed/27989467
35. 191, (Russo, et al, 2018) Russo M, Fanali C, Tripodo G, et al., Analysis of phenolic compounds in different parts of pomegranate (Punica granatum) fruit by HPLC-PDA-ESI/MS and evaluation of their antioxidant activity: application to different Italian varieties. *Anal Bioanal Chem*. 2018 Jun;410(15):3507-3520. doi: 10.1007/s00216-018-0854-8. Epub 2018 Jan 19. https://www.ncbi.nlm.nih.gov/pubmed/29350256
36. 2, (Qu, et al, 2015) Qu, W., Shi, S., Li, P., Pan, Z., Venkitasamy, C. 2015. Extraction kinetics and properties of proanthocyanidins from pomegranate peel. *Int J of Food Engineering*. 10(4):683-695. https://www.ars.usda.gov/research/publications/publication/?seqNo115=317821
37. 53, (Goula, et al, 2017) Goula AM, Ververi M, Adamopoulou A, Kaderides K, Green ultrasound-assisted extraction of carotenoids from pomegranate wastes using vegetable oils. *Ultrason Sonochem.* 2017 Jan;34:821-830. doi: 10.1016/j.ultsonch.2016.07.022. Epub 2016 Jul 27. https://www.ncbi.nlm.nih.gov/pubmed/27773309
38. 38, Ara KM, Raofie F. Application of response surface methodology for the optimization of supercritical fluid extraction of essential oil from pomegranate (Punica granatum L.) peel. *J Food Sci Technol*. 2016;53(7):3113–3121. doi:10.1007/s13197-016-2284-y https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5052180/
39. 106, (Tian, et al, 2013) Tian Y, Xu Z, Zheng B, Martin Lo Y. Optimization of ultrasonic-assisted extraction of pomegranate (Punica granatum L.) seed oil. *Ultrason Sonochem*. 2013 Jan;20(1):202-8. doi: 10.1016/j.ultsonch.2012.07.010. Epub 2012 Aug 17. https://www.ncbi.nlm.nih.gov/pubmed/22964031
40. 149, (Fernandes, et al, 2015) Fernandes L, Pereira JA, Lopéz-Cortés I, et al., Lipid composition of seed oils of different pomegranate (Punica granatum L.) cultivars from Spain. *Int J of Food Studies*,Vol 4, No 1 (2015), https://www.iseki-food-ejournal.com/ojs/index.php/e-journal/article/view/266
41. 36, Abid M, Yaich H, Hidouri H, Attia H, Ayadi MA. Effect of substituted gelling agents from pomegranate peel on colour, textural and sensory properties of pomegranate jam. *Food Chem*. 2018 Jan 15;239:1047-1054. doi: 10.1016/j.foodchem.2017.07.006. Epub 2017 Jul 3. https://www.ncbi.nlm.nih.gov/pubmed/28873521
42. Elaine Watson, Clean label trend opens up new application opportunities for citrus fiber., Foodnavigator-usa.com, Apr 27, 2017, https://www.foodnavigator-usa.com/Article/2017/04/27/Clean-label-creates-new-opportunities-for-citrus-fiber-Fiberstar#

43. 49, (Altunkaya, et al, 2013) Altunkaya A, Hedegaard R, Vingborg S, et al., Antioxidant capacity - versus - chemical safety of wheat bread enriched with pomegranate peel powder. *Food and Function*, 2013, Vol 4, Issue 5, p. 722-727, DOI:10.1039/c3fo30296b http://www.forskningsdatabasen.dk/en/catalog/241113801
44. 90, (Tárrega, et al, 2014) Tárrega MA, Varela P, Fromentin E, et al., Specific phenolic compounds and sensory properties of a new dealcoholized red wine with pomegranate (Punica granatum L.) extract. *Food Sci Technol Int*. 2014 Sep;20(6):421-9. doi: 10.1177/1082013213489128. Epub 2013 Jun 17. https://www.ncbi.nlm.nih.gov/pubmed/23774607
45. Pharma Pom 94, (Vora, et al, 2015) Vora AK, Londhe VY, Pandita NS, Preparation and characterization of standardized pomegranate extract-phospholipid complex as an effective drug delivery tool. *J of Adv Pharm Tech & Research*, 2015 Vol 6 Issue 2, p.75-80 http://www.japtr.org/article.asp?issn=2231-4040;year=2015;volume=6;issue=2;spage=75;epage=80;aulast=Vora
46. 116, Pharma Pom (Li and Zhao, 2013) Li G, Zhao R, Characterization and antioxidant activity of the complex of pomegranate polyphenol extract and lecithin. *J of the Chem Soc of Pakistan*; 2013 v. 35(3) p. 995-999, ISSN 0253-5106; https://inis.iaea.org/search/search.aspx?orig_q=RN:44127844
47. 76, (Syed, et al, 2013) Syed DN, Chamcheu JC, Adhami VM, Mukhtar H. Pomegranate extracts and cancer prevention: molecular and cellular activities. *Anticancer Agents Med Chem*. 2013;13(8):1149–1161. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4052369/?tool=pmcentrez
48. 153, (Barathikannan, et al, 2016) Barathikannan K, Venkatadri B, Khusro A, et al. Chemical analysis of Punica granatum fruit peel and its in vitro and in vivo biological properties. *BMC Complement Altern Med*. 2016;16:264. Published 2016 Jul 30. doi:10.1186/s12906-016-1237-3 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4967515/
49. 185, (Çavdar, et al, 2017) Çavdar HK, Yanık DK, Gök U, Göğüş F. Optimisation of Microwave-Assisted Extraction of Pomegranate (Punica granatum L.) Seed Oil and Evaluation of Its Physicochemical and Bioactive Properties. *Food Technol Biotechnol*. 2017;55(1):86–94. doi:10.17113/ftb.55.01.17.4638 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5434374/
50. (Kushwaha, et al, 2013) Kushwaha SC, Bera MB, Kumar P, Nutritional Composition of Detanninated and Fresh Pomegranate Peel Powder. *IOSR J Of Env Sci, Toxicology & Food Tech* (IOSR-JESTFT) e-ISSN: 2319-2402, ISSN: 2319-2399. Vol 7, Issue 1 (Nov/Dec. 2013), p.38-42 (semanticscholar/pdf) https://pdfs.semanticscholar.org/b023/4744fc04c3f1de82a2c6d255c4dae53e769c.pdf
51. (Yilmaz, et al, 2007) Yilmaz Y, Celik I, Isik F. Mineral composition and total phenolic content of pomegranate molasses. *J of Food, Ag and Env.* 5(3) July 2007. (researchgate) https://www.researchgate.net/publication/265042093_Mineral_composition_and_total_phenolic_content_of_pomegranate_molasses

52. Cécilia Carron, *Pomegranate compound with anti-aging effects passes human trial*. Medicalxpress.com, June 17, 2019 https://medicalxpress.com/news/2019-06-pomegranate-compound-anti-aging-effects-human.html
53. (Tan, et al, 2019) Tan S, Yu CY, Sim ZW, et al., Pomegranate activates TFEB to promote autophagy-lysosomal fitness and mitophagy. *Sci Rep*. 2019 Jan 24;9(1):727. doi: 10.1038/s41598-018-37400-1. https://www.ncbi.nlm.nih.gov/m/pubmed/30679718/
54. (Park, et al, 2018) Park JS, Davis RL, Sue CM. Mitochondrial Dysfunction in Parkinson's Disease: New Mechanistic Insights and Therapeutic Perspectives. *Curr Neurol Neurosci Rep*. 2018;18(5):21. Published 2018 Apr 3. doi:10.1007/s11910-018-0829-3 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5882770/
55. 120, (Viladomiu, et al, 2013) Viladomiu M, Hontecillas R, Lu P, Bassaganya-Riera J. Preventive and prophylactic mechanisms of action of pomegranate bioactive constituents. *Evid Based Complement Alternat Med*. 2013;2013:789764. doi:10.1155/2013/789764 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3657449/?tool=pmcentrez
56. 122, (Zarfeshany, et al, 2014) Zarfeshany A, Asgary S, Javanmard SH, Potent Health Effects of Pomegranate. *Adv Biomed Res* 2014, 3:100, DOI: 10.4103/2277-9175.129371 http://www.advbiores.net/article.asp?issn=2277-9175;year=2014;volume=3;issue=1;spage=100;epage=100;aulast=Zarfeshany
57. 176, (Middha, et al, 2013) Middha SK, Usha T, Pande V. A Review on Antihyperglycemic and Antihepatoprotective Activity of Eco-Friendly Punica granatum Peel Waste. *Evid Based Complement Alternat Med*. 2013;2013:656172. doi:10.1155/2013/656172 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3708418/?tool=pmcentrez
58. (Wang et al, 2018),Wang D, Özen C, Abu-Reidah IM, et al. Vasculoprotective Effects of Pomegranate (Punica granatum L.). *Front Pharmacol*. 2018;9:544. Published 2018 May 24. doi:10.3389/fphar.2018.00544 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5977444/#B72
59. 12, (Dos Santos, et al, 2016) Dos Santos RL, Dellacqua LO, Delgado NT, et al., Pomegranate peel extract attenuates oxidative stress by decreasing coronary angiotensin-converting enzyme (ACE) activity in hypertensive female rats. *J Toxicol Environ Health A*. 2016;79(21):998-1007. Epub 2016 Aug 15. https://www.ncbi.nlm.nih.gov/pubmed/27710705
60. 55, (Asgary, et al, 2017) Asgary S, Keshvari M, Sahebkar A, Sarrafzadegan N. Pomegranate Consumption and Blood Pressure: A Review. *Curr Pharm Des*. 2017;23(7):1042-1050. doi: 10.2174/1381612822666161010103339. https://www.ncbi.nlm.nih.gov/pubmed/27748197
61. 146, (Delgado, et al, 2017) Delgado NT, Rouver WD, Freitas-Lima LC, et al. Pomegranate Extract Enhances Endothelium-Dependent Coronary Relaxation in Isolated Perfused Hearts from Spontaneously Hypertensive Ovariectomized Rats. *Front Pharmacol*. 2017;7:522. Published 2017 Jan 4. doi:10.3389/fphar.2016.00522 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5209391/?tool=pmcentrez

62. 65, (Abdel-Rahim, et al, 2013) Abdel-Rahim EA, El-Beltagi HS, Romela RM, White Bean seeds and Pomegranate peel and fruit seeds as hypercholesterolemic and hypolipidemic agents in albino rats. *Grasas y Aceites, Int J of Fats and Oils*, 64 (1) p. 50-58, 2013, doi: 10.3989/gya.095412 http://grasasyaceites.revistas.csic.es/index.php/grasasyaceites/article/view/1408/1403
63. 129, (Sadeghipour, et al, 2014) Sadeghipour A, Eidi M, Kavgani AI, Ghahramani R, Shahabzadeh S, and Anissian A, "Lipid Lowering Effect of Punica granatum L. Peel in High Lipid Diet Fed Male Rats," *Ev-Based Complementary and Alt Med*, vol. 2014, Article ID 432650, 5 pages, 2014. https://doi.org/10.1155/2014/432650. https://www.hindawi.com/journals/ecam/2014/432650/
64. 117, (Salwe, et al, 2015) Salwe KJ, Sachdev DO, Bahurupi Y, Kumarappan M. Evaluation of antidiabetic, hypolipedimic and antioxidant activity of hydroalcoholic extract of leaves and fruit peel of Punica granatum in male Wistar albino rats. *J Nat Sci Biol Med*. 2015;6(1):56–62. doi:10.4103/0976-9668.149085 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4367068/
65. 140, (Yang, et al, 2018) Yang J, Zhang S, Henning SM, et a., Cholesterol-lowering effects of dietary pomegranate extract and inulin in mice fed an obesogenic diet. *J Nutr Biochem*. 2018 Feb;52:62-69. doi: 10.1016/j.jnutbio.2017.10.003. Epub 2017 Oct 16. https://www.ncbi.nlm.nih.gov/pubmed/29172112
66. 155, (Zhang, et al, 2017) Zhang S, Yang J, Henning SM, Dietary pomegranate extract and inulin affect gut microbiome differentially in mice fed an obesogenic diet. *Anaerobe*. 2017 Dec;48:184-193. doi: 10.1016/j.anaerobe.2017.08.017. Epub 2017 Sep 14. https://www.ncbi.nlm.nih.gov/pubmed/28870713
67. (Pamaja and Prasad, 2011) Padmaja A, Prasad NBL. (2011). *Pomegranate (Punica granatum L.) Peel Extract as a Source of Natural Antioxidant*. 1. 171-182. (researchgate) https://www.researchgate.net/publication/282314718_Pomegranate_Punica_granatum_L_Peel_Extract_as_a_Source_of_Natural_Antioxidant
68. (Kishawy, et al, 2016) Kishawy AT, Omar AE, Ayman M. Gomaa AM, Growth performance and immunity of broilers fed rancid oil diets that supplemented with pomegranate peel extract and sage oil., *Japanese Journal of Veterinary Research* 64(Supplement 2): S31-38 2016 (academia.edu/26619943) http://www.academia.edu/26619943/Growth_performance_and_immunity_of_broilers_fed_rancid_oil_diets_that_supplemented_with_pomegranate_peel_extract_and_sage_oil
69. (Ilyana, et al, 2017) Ilyana A, Ramos-Gonzales R, Segura-Ceniceros EP, Vargas-Segura A, Martinez-Hernandez JL , Zaynullin R, Kunakova R, Korotina T., *Alimentary and Medicinal Plants in Functional Nutrition*. ©Universidad Autonoma De Coahuila, pp123-124, ISBN: 978-607-506-313-3 (posgradoeinvestigacion.uadec.mx/.pdf) http://www.posgradoeinvestigacion.uadec.mx/Documentos/Libros/2017Libroalimentary.pdf
70. (Nokinsee, et al, 2015) Nokinsee D, Shank L, Lee VS, Nimmanpipug P. Estimation of Inhibitory Effect against Tyrosinase Activity through Homology Modeling and Molecular Docking. *Enzyme Res*. 2015;2015:262364. doi:10.1155/2015/262364 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4693013/

71. Pharma Pom 44, (Baccarin, et al, 2017) Baccarin T, Lemos-Senna E, Potential Application of Nanoemulsions for Skin Delivery of Pomegranate Peel Polyphenols. *AAPS PharmSciTech*. 2017 Nov;18(8):3307-3314. doi: 10.1208/s12249-017-0818-x. Epub 2017 Jun 8. https://www.ncbi.nlm.nih.gov/pubmed/28597364
72. Pharma Pom 148, (Houston, et al, 2017) Houston DM, Bugert J, Denyer SP, Heard CM. Anti-inflammatory activity of Punica granatum L. (Pomegranate) rind extracts applied topically to ex vivo skin. *Eur J Pharm Biopharm*. 2017 Mar;112:30-37. doi: 10.1016/j.ejpb.2016.11.014. Epub 2016 Nov 17. https://www.ncbi.nlm.nih.gov/pubmed/27867111
73. 39, (Nair, et al, 2018) Nair MS, Saxena A, Kaur C, Effect of chitosan and alginate based coatings enriched with pomegranate peel extract to extend the postharvest quality of guava (Psidium guajava L.). *Food Chem*. 2018 Feb 1;240:245-252. doi: 10.1016/j.foodchem.2017.07.122. Epub 2017 Jul 25. https://www.ncbi.nlm.nih.gov/pubmed/28946269
74. Pharma Pom 37, (Veiskarami, et al, 2017) Veiskarami S, Fathi M, Ahmadvand H, et al., Effects of Pomegranate peel hydroAlcoholic extract and vitamin E supplementation on Paraoxonase, myeloperoxidase Activities and nitric oxide levels following an exhaustive exercise in rats. *Yafteh* 2017, 18(4): 21-29 http://yafte.lums.ac.ir/browse.php?a_code=A-10-1693-52&slc_lang=en&sid=1
75. 32, (Park, et al, 2016) Park S, Seok JK, Kwak JY, Suh HJ, Kim YM, Boo YC, Anti-Inflammatory Effects of Pomegranate Peel Extract in THP-1 Cells Exposed to Particulate Matter PM10, *Ev-Based Complementary and Alt Med*, vol. 2016, Article ID 6836080, 11 pages, 2016. https://doi.org/10.1155/2016/6836080. https://www.hindawi.com/journals/ecam/2016/6836080/
76. 41, (Rajabi, et al, 2017) Rajabi M, Rouzbehan Y, Rezaei J. A strategy to improve nitrogen utilization, reduce environmental impact, and increase performance and antioxidant capacity of fattening lambs using pomegranate peel extract. *J Anim Sci*. 2017 Jan;95(1):499-510. doi: 10.2527/jas.2016.1069. https://www.ncbi.nlm.nih.gov/pubmed/28177373
77. 34, (Wang T, et al, 2018) Wang T, Men R, Hu M, et al., Protective effects of Punica granatum (pomegranate) peel extract on concanavalin A-induced autoimmune hepatitis in mice. *Biomed Pharmacother*. 2018 Apr;100:213-220. doi: 10.1016/j.biopha.2017.12.110. Epub 2018 Feb 9. https://www.ncbi.nlm.nih.gov/pubmed/29428670
78. 202, (Reddy, et al, 2014) Reddy BU, Mullick R, Kumar A, et al., Small molecule inhibitors of HCV replication from Pomegranate. *Nature Scientific Reports*, Vol 4, id. 5411 (2014). doi: 10.1038/srep05411 http://adsabs.harvard.edu/abs/2014NatSR...4E5411R
79. 56, (Elwej, et al, 2016) Elwej A, Grojja Y, Ghorbel I, et al., Barium chloride induces redox status unbalance, upregulates cytokine genes expression and confers hepatotoxicity in rats-alleviation by pomegranate peel. *Environ Sci Pollut Res Int*. 2016 Apr;23(8):7559-71. doi: 10.1007/s11356-015-6023-0. Epub 2016 Jan 6. https://www.ncbi.nlm.nih.gov/pubmed/26732703

80. 63, (González-Trujano, et al, 2015) González-Trujano ME, Pellicer F, Mena P, Moreno DA, García-Viguera C. Antinociceptive and anti-inflammatory activities of a pomegranate (Punica granatum L.) extract rich in ellagitannins. *Int J Food Sci Nutr*. 2015;66(4):395-9. doi: 10.3109/09637486.2015.1024208. Epub 2015 Mar 30. https://www.ncbi.nlm.nih.gov/pubmed/25822007
81. 133, (Nirwana, et al, 2017) Nirwana I, Rachmadi P, Rianti D. Potential of pomegranate fruit extract (Punica granatum Linn.) to increase vascular endothelial growth factor and platelet-derived growth factor expressions on the post-tooth extraction wound of Cavia cobaya. *Vet World*. 2017;10(8):999–1003. doi:10.14202/vetworld.2017.999-1003 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5591492/
82. 43, (Moghaddam, et al, 2013) Moghaddam G, Sharifzadeh M, Khanavi M, Hassanzadeh G, Hajimahmoodi M. (2013). Anti-Ulcerogenic Activity of the Pomegranate Peel (Punica granatum) Methanol Extract. *Food and Nutrition Sciences*. 04. 43-48. 10.4236/fns.2013.410A008. https://www.researchgate.net/publication/276493970_Anti-Ulcerogenic_Activity_of_the_Pomegranate_Peel_Punica_granatum_Methanol_Extract
83. 85, (Souli, et al, 2015) Souli A, Sebai H, Rtibi K, et al. Inhibitory Effects of Two Varieties of Tunisian Pomegranate (Punica granatum L.) Extracts on Gastrointestinal Transit in Rat. *J Med Food*. 2015;18(9):1007–1012. doi:10.1089/jmf.2014.0110 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4580143/
84. (Zhao et al, 2018) Zhao SS, Ma DX, Zhu Y, et al., Antidiarrheal effect of bioactivity-guided fractions and bioactive components of pomegranate (Punica granatum L.) peels. *Neurogastroenterol Motil*. 2018 Jul;30(7):e13364. doi: 10.1111/nmo.13364. Epub 2018 May 2. https://www.ncbi.nlm.nih.gov/pubmed/29717519
85. 115, (Tavasoli, et al, 2014) Tavasoli S, Zarnani AH, Vafa M, Moradi-Lakeh M, Pazoki-Toroudi H, Eghtesadi S. The effect of pomegranate extract on survival and peritoneal bacterial load in cecal ligation and perforation model of sepsis in rats. *Int J Prev Med*. 2014;5(1):104–109. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3915462/
86. 35, (Hassanpour fard, et al, 2015) Hassanpour fard M, Hassanzadeh Tahery M M, Hosseini M, Ahani A, Ravanbakhsh N, Rabiey N et al . Evaluation of Anti-obesity Effects of Aqueous and Ethanolic Extracts of Pomegranate Fruit Peel Using Anthropometrical Indices in Male Wistar Rats. *J Birjand Univ Med Sci*.. 2015; 22 (1) :39-47 https://www.researchgate.net/publication/340681273_Evaluation_of_Anti-obesity_Effects_of_Aqueous_and_Ethanolic_Extracts_of_Pomegranate_Fruit_Peel_Using_Anthropometrical_Indices_in_Male_Wistar_Rats
87. 47, (Shujaat, et al, 2016) Shujaat A, Hussain MM. (2016). Effect of pomegranate peel alone and in combination with rosiglitazone on hyperglycemia and dyslipidemia in type 2 diabetes mellitus. *Pakistan Armed Forces Medical J*, 66(4), 469-474. https://inis.iaea.org/search/search.aspx?orig_q=RN:48046940
88. 132, (Kerimi, et al, 2017) Kerimi A, Nyambe-Silavwe H, Gauer JS, et al., Pomegranate juice, but not an extract, confers a lower glycemic response on a high-glycemic index food: randomized, crossover, controlled trials in healthy subjects. *Am J Clin Nutr*. 2017

Dec;106(6):1384-1393. doi: 10.3945/ajcn.117.161968. Epub 2017 Oct 11. https://www.ncbi.nlm.nih.gov/pubmed/29021286

89. (Neurath, et al, 2004) (PMC533885/) Neurath AR, Strick N, Li YY, Debnath AK. Punica granatum (Pomegranate) juice provides an HIV-1 entry inhibitor and candidate topical microbicide. BMC Infect Dis. 2004;4:41. Published 2004 Oct 14. doi:10.1186/1471-2334-4-41 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC533885/
90. 9, (Ferrazzano, et al, 2017) Ferrazzano GF, Scioscia E, Sateriale D, et al., In Vitro Antibacterial Activity of Pomegranate Juice and Peel Extracts on Cariogenic Bacteria, *BioMed Research International*, vol. 2017, Article ID 2152749, 7 pages, 2017. https://doi.org/10.1155/2017/2152749. https://www.hindawi.com/journals/bmri/2017/2152749/
91. 16, (Habibipour, et al, 2015) Habibipour R, Moradi Haghgou L. Study on Hydro-Alcoholic Extract Effect of Pomegranate Peel on Pseudomonas aeruginosa Biofilm Formation. *Avicenna J Clin Med*. 2015; 22 (3) :195-202 URL: http://sjh.umsha.ac.ir/article-1-27-en.html
92. 17, (Gu, et al, 2018) Gu X-F,; Chang X-F, Cheng C, et al., Anti-corrosion and Anti-bacteria Property of Modified Pomegranate Peel Extract. *IOP Conference Series: Materials Science and Engineering*, Vol 322, Issue 2, pp. 022004 (2018). DOI: 10.1088/1757-899X/322/2/022004 http://adsabs.harvard.edu/abs/2018MS%26E..322b2004G
93. 8, (Al-Wazni and Hadi, 2019) Al-Wazni WS, Hadi BSi. Antivirulence effects of pomegranate peel extracts on most common urinary tract infection pathogens in pregnant women. *Jl of Contemporary Medical Sciences*, [S.l.], v. 1, n. 4, p. 7-12, Jan. 2016. ISSN 2413-0516. Date accessed: 12 oct. 2019. doi: https://doi.org/10.22317/jcms.v1i4.45. http://www.jocms.org/index.php/jcms/article/view/45
94. 54, (Finegold, et al, 2014) Finegold SM, Summanen PH, Corbett K, et al., Pomegranate extract exhibits in vitro activity against Clostridium difficile. *Nutrition*. 2014 Oct;30(10):1210-2. doi: 10.1016/j.nut.2014.02.029. Epub 2014 Mar 14. https://www.ncbi.nlm.nih.gov/pubmed/24976424
95. 61, (de Oliveira, et al, 2014) de Oliveira Leite SJ, de Oliveira FM, da Silveira Almeida LM, et al., In vitro assessment of the antimicrobial effects of pomegranate (Punica granatum L.) peel decoction on saliva samples. *Rev Ciênc Farm Básica Apl*., 2014;35(1):25-28, ISSN 1808-4532 http://serv-bib.fcfar.unesp.br/seer/index.php/Cien_Farm/article/view/2752/1505
96. 86, (Wafa, et al, 2017) Wafa BA, Makni M, Ammar S, et al., Antimicrobial effect of the Tunisian Nana variety Punica granatum L. extracts against Salmonella enterica (serovars Kentucky and Enteritidis) isolated from chicken meat and phenolic composition of its peel extract. *Int J Food Microbiol*. 2017 Jan 16;241:123-131. doi: 10.1016/j.ijfoodmicro.2016.10.007. Epub 2016 Oct 11. https://www.ncbi.nlm.nih.gov/pubmed/27776287
97. 187, (Aparecida Procópio Gomes, et al, 2016) Aparecida Procópio Gomes L, Alves Figueiredo LM, Luiza do Rosário Palma A, et al. Punica granatum L. (Pomegranate)

Extract: In Vivo Study of Antimicrobial Activity against Porphyromonas gingivalis in Galleria mellonella Model. *ScientificWorldJournal*. 2016;2016:8626987. doi:10.1155/2016/8626987 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5030419/?tool=pmcentrez

98. 14, (Nasiriboroumand, et al, 2018) Nasiriboroumand M, Montazer M, Barani H. Preparation and characterization of biocompatible silver nanoparticles using pomegranate peel extract. *J Photochem Photobiol B*. 2018 Feb;179:98-104. doi: 10.1016/j.jphotobiol.2018.01.006. Epub 2018 Jan 10. https://www.ncbi.nlm.nih.gov/pubmed/29351880
99. 66, (Yang, et al, 2016) Yang H, Ren Y-y, Wang T, Wang C, Preparation and antibacterial activities of Ag/Ag+/Ag3+ nanoparticle composites made by pomegranate (Punica granatum) rind extract. *Results in Physics*, Vol 6, p. 299-304. DOI:10.1016/j.rinp.2016.05.012 http://adsabs.harvard.edu/abs/2016ResPh...6..299Y
100. 71, (Monira, et al, date) Monira AO, Mohammad MA, Ashraf HA, Green biosynthesis of silver nanoparticles using pomegranate peel and inhibitory effects of the nanoparticles on aflatoxin production. *Pakistan J of Botany*; v. 49(2); p. 751-756, ISSN 0556-3321 https://inis.iaea.org/search/search.aspx?orig_q=RN:48076454
101. 73 , (Nadagouda, et al, 2014) Nadagouda M, Iyanna N, Lalley J, Han C, Dionysiou D, Varma R. Synthesis of Silver and Gold Nanoparticles Using Antioxidants from Blackberry, Blueberry, Pomegranate, and Turmeric Extracts. *ACS Sustainable Chemistry & Engineering*. ACS Publications, Washington, DC, 2(7):1717-1723, (2014). https://pubs.acs.org/doi/10.1021/sc500237k
102. 135, (Rao, et al, 2013) Rao A, Mahajan K, Bankar A, et al.,Facile synthesis of size-tunable gold nanoparticles by pomegranate (Punica granatum) leaf extract: Applications in arsenate sensing. *Applications in arsenate sensing*. United States: N. p., 2013. Web. doi:10.1016/J.MATERRESBULL.2012.12.025. https://www.osti.gov/etdeweb/biblio/22290393
103. (Pandikumar and Ramaraj, 2018) Alagarsamy Pandikumar, Ramasamy Ramaraj, *Rational Design of Solar Cells for Efficient Solar Energy Conversion,* Alagarsamy (2018) (Google books link)
104. (Zarroug, et al, 2014) Zarroug M, Souad Najar Souissi SN, Ouederni A., Pomegranate peels as a precursor for activated carbon by phosphoric acid and steam activation: Carbonization temperature and time effects, *2014 5th International Renewable Energy Congress, (IREC),* 25-27 March 2014, IEEE, DOI: 10.1109/IREC.2014.6826990 (ieeexplore.ieee.org/document/6826990) https://ieeexplore.ieee.org/document/6826990
105. (Jawad, et al, 2018) Jawad AL, Sauodi MH, Mastuli MS, et al, Pomegranate peels collected from fresh juice shop as a renewable precursor for high surface area activated carbon with potential application for methylene blue adsorption, (2018) (pdf) *Desalination and water treatment* ·124 (2018) 287–296, August 2018, doi:10.5004/dwt.2018.22725 https://www.researchgate.net/profile/Ali_H_Jawad/publication/328136156_Pomegranate_peels_collected_from_fresh_juice_shop_as_a_renewable_precursor_for_high_surface_area_activated_carbon_with_potential_application_for_methylene_blue_adsorption/link

s/5bda7637299bf1124fb192a6/Pomegranate-peels-collected-from-fresh-juice-shop-as-a-renewable-precursor-for-high-surface-area-activated-carbon-with-potential-application-for-methylene-blue-adsorption.pdf?origin=publication_detail

106. 92, (Amin, 2009) Amin NK, Removal of direct blue-106 dye from aqueous solution using new activated carbons developed from pomegranate peel: Adsorption equilibrium and kinetics. *J of Hazardous Materials*, Vol 165, Issues 1–3, 15 June 2009, p. 52-62 https://www.sciencedirect.com/science/article/pii/S0304389408014192?via%3Dihub

107. 48, (Nehaba, 2017) Sundus S. Nehaba, Synthetic Textile Red Dye Removal From Aqueous Solution by Adsorption onto Pomegranate Peel. *J of Babylon University*/Engineering Sciences/ No.(4)/ Vol.(25): 2017. https://www.dropbox.com/s/cf8u03ylj7n8re2/uobj_paper_2017_52550538%20%281%29.pdf?dl=0

108. 59, (Sinnur, et al, 2018) Sinnur HD, Samanta AK, Verma DK, Kaware R, Studies on Coloration and UV Protective Action of Anar Peel (Pomegranate Rind) as an Effective Natural Colorant for Cotton Khadi Fabric. *J of the Institution of Engineers* (India): June 2018 Series E, Vol 99, Issue 1, pp.9-26, DOI:10.1007/s40034-017-0106-z http://adsabs.harvard.edu/abs/2018JIEIE..99....9S

109. 19, (Mohammed, et al, 2016) Mohammed IAS, Hassanien FR, El Sahy KM, et al., Keeping Quality of Beef Sausage Using Ethanolic Extract of Gamma-Irradiated Pomegranate Peel Powder. *APTEFF*, 47, 1-265 (2016), DOI: 10.2298/APT1647029M http://www.doiserbia.nb.rs/img/doi/1450-7188/2016/1450-71881647029M.pdf

110. 40, (Hayrapetyan, et al, date) Hayrapetyan H, Hazeleger WC, Beumer RR, Inhibition of Listeria monocytogenes by pomegranate (Punica granatum) peel extract in meat paté at different temperatures. *Food Control*, Vol. 23, No. 1, p.66-72. ISSN 0956-7135. https://www.narcis.nl/publication/RecordID/oai%3Alibrary.wur.nl%3Awurpubs%2F417811/uquery/vitro%20AND%20meat/id/16/Language/EN

111. 11, (Turgut, et al, 2016) Turgut SS, Soyer A, Işıkçı F, Effect of pomegranate peel extract on lipid and protein oxidation in beef meatballs during refrigerated storage. *Meat Sci*. 2016 Jun;116:126-32. doi: 10.1016/j.meatsci.2016.02.011. https://www.ncbi.nlm.nih.gov/pubmed/26878610

112. 26, (Turgut, et al, 2017) Turgut SS, Işıkçı F, Soyer A.Antioxidant activity of pomegranate peel extract on lipid and protein oxidation in beef meatballs during frozen storage. *Meat Sci*. 2017 Jul;129:111-119. doi: 10.1016/j.meatsci.2017.02.019. https://www.ncbi.nlm.nih.gov/pubmed/28273584

113. 139, (Devatkal, et al, 2010) Devatkal SK, Narsaiah K, Borah A. Anti-oxidant effect of extracts of kinnow rind, pomegranate rind and seed powders in cooked goat meat patties. *Meat Sci*. 2010 May;85(1):155-9. doi: 10.1016/j.meatsci.2009.12.019. https://www.ncbi.nlm.nih.gov/pubmed/20374879

114. 51, (John, et al, 2017) John KMA, Luthria DL, Bhagwat AA, Swarm motility inhibitory and antioxidant activities of pomegranate peel processed under three drying conditions. *Food Chemistry*. 2017, 235:145-153. https://www.ars.usda.gov/research/publications/publication/?seqNo115=332992 Same paper: 52, https://www.ncbi.nlm.nih.gov/pubmed/28554619

115. 201, (Ünalan, et al, 2011) Ünalan U,; Dalgaard P, Korel F,, Effect of pomegranate (Punica granutum) and rosemary (Rosmarinus officinalis L.) extracts on shelf-life for chilled Greenland halibut (Reinhardtius hippoglossoides) fillets in modified atmosphere packaging at 2 ºC. *Proceedings Of The International Food Congress Novel Approaches In Food Industry*, 2011. Downloaded from orbit.dtu.dk on: Oct 14, 2019 http://orbit.dtu.dk/ws/files/5825090/91886d01.pdf
116. 107, (Chandralekha, et al, 2012) Chandralekha S, Babu AJ, Sreenivasa Moorthy PR, Karthikeyan B, Studies on the Effect of Pomegranate Rind Powder Extract as Natural Antioxidant in Chicken Meat Balls During Refrigerated Storage. *J of Adv Veterinary Research*, [S.l.], v. 2, n. 2, p. 107-112, apr. 2012. ISSN 2090-6277 https://advetresearch.com/index.php/AVR/article/view/164
117. 170, (Bastide, et al, 2017) Bastide NM, Naud N, Nassy G, et al., Red Wine and Pomegranate Extracts Suppress Cured Meat Promotion of Colonic Mucin-Depleted Foci in Carcinogen-Induced Rats. *Nutr Cancer*. 2017 Feb-Mar;69(2):289-298. doi: 10.1080/01635581.2017.1263745. https://www.ncbi.nlm.nih.gov/pubmed/28094544
118. 179, (Keşkekoğlu, et al, 2014) Keşkekoğlu H, Uren A, et al., Inhibitory effects of pomegranate seed extract on the formation of heterocyclic aromatic amines in beef and chicken meatballs after cooking by four different methods. *Meat Sci*. 2014 Apr;96(4):1446-51. doi: 10.1016/j.meatsci.2013.12.004. https://www.ncbi.nlm.nih.gov/pubmed/24398004
119. 5, (Aziza, et al, 2018) Aziza ARA, Lailab MRA, Aziz M, et al., In vitro and in vivo anthelmintic activity of pumpkin seeds and pomegranate peels extracts against Ascaridia galli. *Beni-Suef University Journal of Basic and Applied Sciences,* Vol 7, Issue 2, June 2018, p. 231-234 https://www.sciencedirect.com/science/article/pii/S2314853517303918
120. 83, (Yones, et al, 2016) Yones DA, Dalia M. Badary DM, Hesham M. B. Sayed HMB, et al., Comparative Evaluation of Anthelmintic Activity of Edible and Ornamental Pomegranate Ethanolic Extracts against Schistosoma mansoni. *BioMed Research International*, Vol 2016, Article ID 2872708, 15 pages, http://dx.doi.org/10.1155/2016/2872708 https://www.hindawi.com/journals/bmri/2016/2872708/
121. 60, (Al-Mathal and Alsalem, 2012) Al-Mathal EM, Alsalem AM. Pomegranate (Punica granatum) peel is effective in a murine model of experimental Cryptosporidium parvum. Exp Parasitol. 2012 Jul;131(3):350-7. doi: 10.1016/j.exppara.2012.04.021. https://www.ncbi.nlm.nih.gov/pubmed/22580265
122. 88, (Madugula, et al, 2017) Madugula P, Reddy S, Koneru J, Rao AS, Sruthi R, Dalli DT. "Rhetoric to Reality"- Efficacy of Punica Granatum Peel Extract on Oral Candidiasis: An in vitro Study. *J Clin Diagn Res*. 2017;11(1):ZC114–ZC117. doi:10.7860/JCDR/2017/22810.9304 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5324484/
123. 22, (Pangallo, et al, 2017) Pangallo S, Nicosia MGLD, Agosteo GE, et al., Evaluation of a Pomegranate Peel Extract as an Alternative Means to Control Olive Anthracnose. *Phytopathology*. 2017 Dec;107(12):1462-1467. doi: 10.1094/PHYTO-04-17-0133-R https://www.ncbi.nlm.nih.gov/pubmed/28766401

124. 45, (Romeo, et al 2015) Romeo FV, Ballistreri G, Fabroni S, et al., Chemical Characterization of Different Sumac and Pomegranate Extracts Effective against Botrytis cinerea Rots. Molecules 2015, 20(7), 11941-11958; https://doi.org/10.3390/molecules200711941 https://www.mdpi.com/1420-3049/20/7/11941
125. (Li Y, et al, 2016) Li Y, Ye T, Fangfang Yang F, et al., Punica granatum (pomegranate) peel extract exerts potent antitumor and anti-metastasis activity in thyroid cancer. *RSC Advances*, Issue 87, 2016 https://pubs.rsc.org/en/content/articlelanding/2016/ra/c6ra13167k#!divAbstract
126. (Nair, et al, 2011) Nair V, Dai Z, Khan M, Ciolino HP, Pomegranate Extract Induces Cell Cycle Arrest and Alters Cellular Phenotype of Human Pancreatic Cancer Cells. *Anticancer research* 31(9):2699-704 · September 2011 (researchgate.net) https://www.researchgate.net/publication/51596733_Pomegranate_Extract_Induces_Cell_Cycle_Arrest_and_Alters_Cellular_Phenotype_of_Human_Pancreatic_Cancer_Cells
127. 18, (Deng, et al, 2017) Deng Y, Li Y, Yang F, et al., The extract from Punica granatum (pomegranate) peel induces apoptosis and impairs metastasis in prostate cancer cells. *Biomed Pharmacother*. 2017 Sep;93:976-984. doi: 10.1016/j.biopha.2017.07.008. https://www.ncbi.nlm.nih.gov/pubmed/28724216
128. 178, (Paller, et al 2017) Paller CJ, Pantuck A, Carducci MA. A review of pomegranate in prostate cancer. *Prostate Cancer Prostatic Dis*. 2017;20(3):265–270. doi:10.1038/pcan.2017.19 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5555799/
129. 87, (Rahmani, et al, 2017) Rahmani AH, Alsahli MA, Almatroodi SA. Potential Antitumor Effects of Pomegranates and Its Ingredients. *Pharmacogn Rev*. 2017;11(22):136–140. doi:10.4103/phrev.phrev_25_17 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5628519/
130. 105, (Kawaii and Lansky, 2004) Kawaii S, Lansky EP. Differentiation-promoting activity of pomegranate (Punica granatum) fruit extracts in HL-60 human promyelocytic leukemia cells. *J Med Food*. 2004 Spring;7(1):13-8. https://www.ncbi.nlm.nih.gov/pubmed/15117547
131. 112, (Lee ST, et al, 2013) Lee ST, Lu MH, Chien LH, Wu TF, Huang LC, Liao GI. Suppression of urinary bladder urothelial carcinoma cell by the ethanol extract of pomegranate fruit through cell cycle arrest and apoptosis. *BMC Complement Altern Med*. 2013;13:364. Published 2013 Dec 21. doi:10.1186/1472-6882-13-364 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3878077/
132. (Richmond, LE2018) Richmond G, *Pomegranate Thwarts Cancer on Several Levels*, June 2018, Life Extension, https://www.lifeextension.com/Magazine/2018/6/Pomegranate-And-Cancer/Page-01
133. Pharma Pom (Vora, et al, 2015) Vora, Amisha & Londhe, Vaishali & Pandita, Nancy. (2015). Preparation and characterization of standardized pomegranate extract-phospholipid complex as an effective drug delivery tool. *Journal of Advanced Pharmaceutical Technology & Research*. 6. 75-80. 10.4103/2231-4040.154542. https://www.researchgate.net/publication/275052620_Preparation_and_characterization

_of_standardized_pomegranate_extract-phospholipid_complex_as_an_effective_drug_delivery_tool

134. 131, (Ammar, et al, 2015) Ammar AE, Esmat A, Hassona MD, et al.,The effect of pomegranate fruit extract on testosterone-induced BPH in rats. *Prostate*. 2015 May;75(7):679-92. doi: 10.1002/pros.22951. https://www.ncbi.nlm.nih.gov/pubmed/25620586

135. 159, (Fedder, et al, 2014) Fedder MD, Jakobsen HB, Giversen I, Christensen LP, Parner ET, Fedder J. An extract of pomegranate fruit and galangal rhizome increases the numbers of motile sperm: a prospective, randomised, controlled, double-blinded trial. *PLoS One*. 2014;9(9):e108532. Published 2014 Oct 2. doi:10.1371/journal.pone.0108532 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4190413/

136. Pom (Ilyana, et al, 2017) Ilyana A, Ramos-Gonzales R, Segura-Ceniceros EP, Vargas-Segura A, Martinez-Hernandez JL , Zaynullin R, Kunakova R, Korotina T., *Alimentary and Medicinal Plants in Functional Nutrition*. ©Universidad Autonoma De Coahuila, pp123-124, ISBN: 978-607-506-313-3 (posgradoeinvestigacion.uadec.mx/.pdf) http://www.posgradoeinvestigacion.uadec.mx/Documentos/Libros/2017Libroalimentary.pdf

137. 70, (Bakir, et al, 2015) Bakır S, Yazgan ÜC, İbiloğlu İ, et al., The protective effect of pomegranate extract against cisplatin toxicity in rat liver and kidney tissue. *Arch Physiol Biochem*. 2015;121(4):152-6. https://www.ncbi.nlm.nih.gov/pubmed/26247305

138. 101, (Mirazi, et al, 2015) Mirazi N, Nosrati S, Hosseini A. Evaluation of pomegranate rind (Punica granatum) hydroethanolic extract on blood parameters in male mice treated by Irinotecan Hcl. *Armaghane danesh*. 2015; 20 (2) :114-126 http://armaghanj.yums.ac.ir/browse.php?a_code=A-10-1-351&slc_lang=en&sid=1

139. 141, (Selimoğlu Şen, et al, 2014) Selimoğlu Şen H, Şen V, Bozkurt M, et al. Carvacrol and pomegranate extract in treating methotrexate-induced lung oxidative injury in rats. *Med Sci Monit*. 2014;20:1983–1990. Published 2014 Oct 19. doi:10.12659/MSM.890972 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4211419/?tool=pmcentrez

140. 72, (Ahmed, et al, 2014) Ahmed MA, El Morsy EM, Ahmed AA. Pomegranate extract protects against cerebral ischemia/reperfusion injury and preserves brain DNA integrity in rats. *Life Sci*. 2014 Aug 21;110(2):61-9. doi: 10.1016/j.lfs.2014.06.023. https://www.ncbi.nlm.nih.gov/pubmed/25010842

141. 20, (Morzelle, et al, 2016) Morzelle MC, Salgado JM, Telles M, et al. Neuroprotective Effects of Pomegranate Peel Extract after Chronic Infusion with Amyloid-β Peptide in Mice. *PLoS* One. 2016;11(11):e0166123. Published 2016 Nov 9. doi:10.1371/journal.pone.0166123 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5102433/?tool=pmcentrez

142. 99, (Rojanathammanee, et al, 2013) Rojanathammanee L, Puig KL, Combs CK. Pomegranate polyphenols and extract inhibit nuclear factor of activated T-cell activity and microglial activation in vitro and in a transgenic mouse model of Alzheimer disease.

J Nutr. 2013;143(5):597–605. doi:10.3945/jn.112.169516 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3738232/

143. 182, (Adiga, et al, date) Adiga S, Trivedi P,; Ravichandra V, et al., Effect ofPunica granatum peel extract on learning and memory in rats. *Asia Pacific Tropical Medicine J,* 2010, 000, 009, pp 687-690 [Article in Chinese] http://www.istic.ac.cn/suoguan/detailed.htm?dbname=zw_qk&wid=0120160111715934
144. 23 , (Spilmont, et al, 2015) Spilmont M, Léotoing L, Davicco M-J, et al., Pomegranate Peel Extract Prevents Bone Loss in a Preclinical Model of Osteoporosis and Stimulates Osteoblastic Differentiation in Vitro. *Nutrients* 2015, 7(11), 9265-9284; https://doi.org/10.3390/nu7115465 https://www.mdpi.com/2072-6643/7/11/5465
145. 24, (Spilmont, et al, 2015) Spilmont M, Léotoing L, Davicco MJ, et al. Pomegranate Peel Extract Prevents Bone Loss in a Preclinical Model of Osteoporosis and Stimulates Osteoblastic Differentiation in Vitro. *Nutrients*. 2015;7(11):9265–9284. Published 2015 Nov 11. doi:10.3390/nu7115465 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4663593/
146. (Sree Varicola, et al, 2018) Sree Varicola K, Ali A, & Dintyala K, Ventrapati G. (2018). *Fruit Peel Extracts With Potential For Dissolving Simulated Renal Stones In In-Vitro Conditions.* International Journal of Pharmacy and Pharmaceutical Sciences. 10. 74. 10.22159/ijpps.2018v10i11.27862. (researchgate) https://www.researchgate.net/publication/329035989_FRUIT_PEEL_EXTRACTS_WITH_POTENTIAL_FOR_DISSOLVING_SIMULATED_RENAL_STONES_IN_IN_VITRO_CONDITIONS
147. 31, (Rashid, et al, 2017) Rashid K, Shakor Z, Ahmed A, (2017) Modelling and Optimization of Corrosion Inhibition of Mild Steel in Phosphoric Acid by Red Pomegranate Peels Aqueous Extract, *J of Engineering*, 23(11), pp. 25-42. http://joe.uobaghdad.edu.iq/index.php/main/article/view/360
148. 79, (Khalaf and Khalaf, 2005) Khalaf MA, Khalaf SA, (2005). Pomegranate peels: A novel ago-residue for tannate production by gamma irradiated aspergillus versicolor under solid state fermentation. *Isotope and Radiation Research*, 37(2), 1005-1022. https://inis.iaea.org/search/search.aspx?orig_q=RN:37055625
149. (Wang, et al, 2018) Wang HQ, Zhang LY, Cui QF, Extraction of pomegranate peel tannins and flocculant for Microcystis aeruginosa removal. *Int. J. Environ. Sci. Technol*. (2018) 15: 2713. https://doi.org/10.1007/s13762-018-1771-2 https://link.springer.com/article/10.1007/s13762-018-1771-2
150. (1) (Shukla, et al, 2008) Shukla M, Gupta K, Rasheed Z, et al. (2008). Bioavailable constituents/metabolites of pomegranate (Punica granatum L) preferentially inhibit COX-II activity ex vivo and IL-1beta-induced PGE2 production in human chondrocytes in vitro. *Journal of inflammation* (London, England). 5. 9. 10.1186/1476-9255-5-9. https://www.researchgate.net/publication/5301162_Bioavailable_constituentsmetabolites_of_pomegranate_Punica_granatum_L_preferentially_inhibit_COX-II_activity_ex_vivo_and_IL-1beta-induced_PGE2_production_in_human_chondrocytes_in_vitro
151. (2) (Jean, et al, 2006) Jean Y. Park, Michael H. Pillinger, Steven B. Abramson, Prostaglandin E2 synthesis and secretion: The role of PGE2 synthases, *Clinical Immunology*, Vol 119, Iss 3, 2006, pp 229-240, ISSN 1521-6616,

https://doi.org/10.1016/j.clim.2006.01.016. https://www.sciencedirect.com/science/article/pii/S1521661606000453 (2)

152. (5) (Matsubara, et al, 2015) Matsubara K, Higaki T, Matsubara Y, Nawa A. Nitric Oxide and Reactive Oxygen Species in the Pathogenesis of Preeclampsia. Miller FJ, ed. *International Journal of Molecular Sciences*. 2015;16(3):4600-4614. doi:10.3390/ijms16034600. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4394437/ (5)
153. (9) (Aouache, et al, 2018) Aouache R, Biquard L, Vaiman D, Miralles F. Oxidative Stress in Preeclampsia and Placental Diseases. *International Journal of Molecular Sciences*. 2018;19(5):1496. doi:10.3390/ijms19051496. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5983711/ (9)
154. (6) (de Nigris, et al, 2007) de Nigris F, Balestrieri ML, Williams-Ignarro S, et al, The influence of pomegranate fruit extract in comparison to regular pomegranate juice and seed oil on nitric oxide and arterial function in obese Zucker rats, *Nitric Oxide*, Volume 17, Issue 1, 2007, pp 50-54, ISSN 1089-8603, https://doi.org/10.1016/j.niox.2007.04.005. http://www.sciencedirect.com/science/article/pii/S1089860307000432 (6)
155. (4) (Mandal, et al, 2017) Mandal A, Bhatia D, Bishayee A. *Anti-Inflammatory Mechanism Involved in Pomegranate-Mediated Prevention of Breast Cancer: the Role of NF-κB and Nrf2 Signaling Pathways*. *Nutrients*. 2017;9(5):436. doi:10.3390/nu9050436. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5452166/ (4)
156. Pomegranate Extract Update - has similar mechanism to NSAIDs.
157. Pomegranate Health Benefits, Serving Size, and Extract Recipe Summary,
158. It is not a coincidence that my phospholipid rich diet overlaps with Nrf2 promoting foods,
159. Nrf2 Promoting Foods
160. Some Pomegranate Ideas re Crop Use and Climate Change.
161. To Have Optimal Magnesium Needs Protein and Phospholipids Too.
162. [Neurotransmitters and mood]
163. [Acetylcholine and mood]
164. Khalifeh, S., Oryan, S., Digaleh, H. et al. *Involvement of Nrf2 in Development of Anxiety-Like Behavior by Linking Bcl2 to Oxidative Phosphorylation: Estimation in Rat Hippocampus, Amygdala, and Prefrontal Cortex*, *J Mol Neurosci* (2015) 55: 492. https://doi.org/10.1007/s12031-014-0370-z, (springer.com)
165. *What are the Advantages of Pomegranate?*, Matt, 2018 (MensHub)
166. *Benefits of Pomegranate*, (2015) (juliadiets)
167. Dadashi, Saeed & Mousazadeh, Morad & Emam-Djomeh, Zahra & Mohammad Mousavi, Seyed. (2013). *Pomegranate (Punica granatum L.) seed: A comparative study on biochemical composition and oil physicochemical characteristics*. International journal of Advanced Biological and Biomedical Research. 1. 351-363. http://www.ijabbr.com/article_6903.html
168. (*seaweed as a fertilizer for iodine*, Google search results)
169. (Are pomegranates a good source of iodine?)
170. (Demir and Demir, 2018) Demir H, Demir B.B (2018) *Comparison of Chemical Composition of Pomegranate (Punica Granatum L.) and Grape (Vitis Vinifera L.) Seed*

Oils Obtained By Extraction. J Adv Food Technol 1(2): 202 http://www.annexpublishers.com/articles/JAFT/1202-Comparison-of-Chemical-Composition-of-Pomegranate-Punica-Granatum-L-and-Grape-Vitis-Vinifera-L.-Seed-Oils-Obtained-By-Extraction.pdf

171. (previous posts, a series about making pomegranate extract in the home kitchen)
172. (a pictorial with descriptions of making pomegranate peel extract in a rice steamer: twitter.com/deNutrients)
173. (Yuniarti, et al, 2018) Yuniarti WM, Primarizky H, Lukiswanto BS. *The activity of pomegranate extract standardized 40% ellagic acid during the healing process of incision wounds in albino rats (Rattus norvegicus).* Vet World. 2018;11(3):321-326. (ncbi.nlm.nih.gov) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5891847/
174. *Nutritional Composition of Detanninated and Fresh Pomegranate Peel Powder* (Kushwaha, 2013) (semanticscholar/pdf)
175. COX2 inhibitors and tachycardia)
176. 27, (Shaifiyan, et al, 2016) Sharifiyan F, Movahedian-Attar A, Nili N, Asgary S. Study of pomegranate (Punica granatum L.) peel extract containing anthocyanins on fatty streak formation in the renal arteries in hypercholesterolemic rabbits. *Adv Biomed Res* 2016;5:8 http://www.advbiores.net/article.asp?issn=2277-9175;year=2016;volume=5;issue=1;spage=8;epage=8;aulast=Sharifiyan
177. 28, 27, (Shaifiyan, et al, 2016) Sharifiyan F, Movahedian-Attar A, Nili N, Asgary S. Study of pomegranate (Punica granatum L.) peel extract containing anthocyanins on fatty streak formation in the renal arteries in hypercholesterolemic rabbits. *Adv Biomed Res*. 2016;5:8. Published 2016 Jan 29. doi:10.4103/2277-9175.175241 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4770606/
178. *Best practice in research – Overcoming common challenges in phytopharmacological research*, Heinrich, et al, 2020)
179.
180.

Additions

How-to video for a pomegranate beverage - with alcohol, but could be made without: https://youtu.be/i2rHBspSIhE in Spanish but the demonstration is fairly easy to follow.

Carme Grau-Bové, Alba Miguéns-Gómez, Carlos González-Quilen, Marta Sierra-Cruz, Esther Rodríguez-Gallego, Raúl Beltrán-Debón, M Teresa Blay, Ximena Terra, Anna Ardévol, Montserrat Pinent, Modulation of food intake by selective TAS2R stimulation in rat,

(doi:10.3390/IECN2020-07168) https://sciforum.net/paper/view/conference/7168 pdf presentation: https://www.dropbox.com/s/u5okzt866ls6os0/bitter%20taste%20receptors%20poster_CGrau-Bove.pdf?dl=0

1. (Howell and D'Souza, 2013) Howell AB, D'Souza DH, The Pomegranate: Effects on Bacteria and Viruses That Influence Human Health. *Evidence-Based Complementary and Alternative Medicine,* Vol 2013, Article ID 606212, 11 pages http://dx.doi.org/10.1155/2013/606212 https://www.hindawi.com/journals/ecam/2013/606212/
2. (already in main document) Noda Y, Kaneyuki T, Mori A, and Packer L, Antioxidant Activities of Pomegranate Fruit Extract and Its Anthocyanidins: Delphinidin, Cyanidin, and Pelargonidin, *J Ag and Food Chem* 2002 *50* (1), 166-171 DOI: 10.1021/jf0108765 https://pubs.acs.org/doi/pdf/10.1021/jf0108765
3. https://www.sciencedirect.com/science/article/pii/B9780128144664000082
4. 2.4 Metal Complexation, Anthocyanins, D.R. Kammerer, *Handbook on Natural Pigments in Foods and Beverages*, 2016, Editors: Reinhold Carle, Ralf Schweiggert https://www.elsevier.com/books/handbook-on-natural-pigments-in-food-and-beverages/carle/978-0-08-100371-8 https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/delphinidin *anthocyanins "(mainly cyanidin, delphinidin, petunidin glycosides) , may form complexes with di or trivalent metal ions such as Fe+3, Al+3, Mg+2, Sn+2, or Cu+2.. " Also:

(Junichi, et al, 2020) Junichi R. Sakaki, Melissa M. Melough, Ock K. Chun, Chapter 14 - Anthocyanins and anthocyanin-rich food as antioxidants in bone pathology, Editor(s): Victor R. Preedy, *Pathology*, Academic Press, 2020, Pages 145-158, ISBN 9780128159729, https://doi.org/10.1016/B978-0-12-815972-9.00014-7. https://www.sciencedirect.com/science/article/pii/B9780128159729000147

> "*Anthocyanin compounds*
> *Moriwaki et al., [(Moriwaki et al, 2014)] observed that delphinidin inhibited osteoclastogenesis and osteoclastogenic transcription factors in RAW 264.7 macrophages.23 Further, Casati et al., observed that delphinidin-3-rutinoside increased expression of osteoblastogenic markers in MC3T3-E1 cells.33 Malvidin increased calcium accumulation in osteocytes and increased the expression of osteogenic transcription factors.30*" (Junichi, et al, 2020)

(Moriwaki et al, 2014) Moriwaki S, Suzuki K, Muramatsu M, Nomura A, Inoue F, Into T, Yoshiko Y, Niida S. Delphinidin, one of the major anthocyanidins, prevents bone loss through the inhibition of excessive osteoclastogenesis in osteoporosis model mice. *PLoS One*. 2014 May 13;9(5):e97177. doi: 10.1371/journal.pone.0097177. PMID: 24824988; PMCID: PMC4019566. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4019566/ anthocyanins help prevent bone loss by reducing osteoclastogenesis

https://cancerpreventionresearch.aacrjournals.org/content/1/7/522

(Kuo, et al, 2019) Kuo, HC.D., Wu, R., Li, S. *et al.* Anthocyanin Delphinidin Prevents Neoplastic Transformation of Mouse Skin JB6 P+ Cells: Epigenetic Re-activation of Nrf2-ARE Pathway. *AAPS J* 21, 83 (2019). https://doi.org/10.1208/s12248-019-0355-5
https://link.springer.com/article/10.1208/s12248-019-0355-5 "delphinidin, an epigenetic demethylating agent of the Nrf2 promoter, can activate the Nrf2-ARE pathway"

(Khalifeh, et al, 2015) Khalifeh S, Oryan S, Digaleh H, et al. Involvement of Nrf2 in Development of Anxiety-Like Behavior by Linking Bcl2 to Oxidative Phosphorylation: Estimation in Rat Hippocampus, Amygdala, and Prefrontal Cortex. *J Mol Neurosci* 55, 492–499 (2015). https://doi.org/10.1007/s12031-014-0370-z
https://link.springer.com/article/10.1007/s12031-014-0370-z

Microbiome
(Li Z, et al, 2015) Li Z, Summanen P, Komoriya T, et al. (2015). Pomegranate Ellagitannins Stimulate Growth of Gut Bacteria In Vitro: Implications for Prebiotic and Metabolic Effects. Anaerobe. 34. 10.1016/j.anaerobe.2015.05.012.
https://www.researchgate.net/publication/277727177_Pomegranate_Ellagitannins_Stimulate_Growth_of_Gut_Bacteria_In_Vitro_Implications_for_Prebiotic_and_Metabolic_Effects/amp

Dif topic curcuminoids Vit D receptor analog

- Vitamin D Receptor analog
  https://www.researchgate.net/publication/41428029_Curcumin_A_Novel_Nutritionally-Derived_Ligand_of_the_Vitamin_D_Receptor_with_Implications_for_Colon_Cancer_Chemoprevention
- Full text review includes formulations for increasing bioavailability
  https://www.sciencedirect.com/science/article/pii/S2225411016300293
- Lin X, Bai D, Wei Z, et al. Curcumin attenuates oxidative stress in RAW264.7 cells by increasing the activity of antioxidant enzymes and activating the Nrf2-Keap1 pathway. *PLoS One*. 2019;14(5):e0216711. Published 2019 May 21. doi:10.1371/journal.pone.0216711
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6528975/

Vitamin D and A in seasonal flu

(Mawson, 2013) Mawson AR, Role of Fat-Soluble Vitamins A and D in the Pathogenesis of Influenza: A New Perspective, *International Scholarly Research Notices*, vol. 2013, Article ID 246737, 26 pages, 2013. https://doi.org/10.5402/2013/246737 https://www.hindawi.com/journals/isrn/2013/246737/

Sialidase inhibitors in infection

Glanz VY, Myasoedova VA, Grechko AV, Orekhov AN. Inhibition of sialidase activity as a therapeutic approach. *Drug Des Devel Ther*. 2018 Oct 10;12:3431-3437. doi: 10.2147/DDDT.S176220. PMID: 30349196; PMCID: PMC6186905. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6186905/

Capers and 4-ethylcatechol, lactobacillus species, traditional fermented foods/cider/wine

Capers are on my Nrf2 promoting foods list. The 'nonpareilles' bud stage of 6 stages has the most phytonutrient content. There may be a speciality market within the speciality market.

Polyphenol Compounds and Biological Activity of Caper (Capparis spinosa L.) Flowers Buds https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6963175/

Excerpt below from: (Senger, 2016) Activation of the Nrf2 Cell Defense Pathway by Ancient Foods: Disease Prevention by Important Molecules and Microbes Lost from the Modern Western Diet

"As illustrated in Figs99–18, several lactobacillus species, in combination with common dietary components, can provide a ready source of 4-ethylcatechol, 4-vinylcatechol, and catechol. Phenolic acid decarboxylase (PAD) (Fig 9) is pivotal to the generation of these Nrf2 co-factors. PAD is expressed by a subset of lactobacillus species found ubiquitously in nature [91, 92, 94, 100, 108]. In particular, many of these lactobacilli are associated with a variety of food products of plant origin that are fermented by traditional, but not modern, methods (reviewed in [93]). These foods and beverages include many fermented vegetables such as olives, cabbage, cucumbers, eggplants, caper berries, and grape extracts (reviewed in [93]), and also traditional ciders [99, 100, 109, 110], wines [108, 111], malt whiskeys [92], and sourdough breads [112]. In addition to fermentative lactobacilli, fermentative yeasts such as the Brettanomyces/Dekkera species found in traditional ciders and beers also express PAD [101, 113–115]." (Senger, et al, 2016)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4757558/

*fermented pomegranate products might be a good fit too.