

References

- Abu-Reidah IM, Ali-Shtayeh MS, Jamous RM, Arráez-Román D, Segura-Carretero A. 2015. HPLC–DAD–ESI-MS/MS screening of bioactive components from *Rhus coriaria* L.(Sumac) fruits. *Food Chemistry* 166:179-191.
- Abu-Reidah IM, Ali-Shtayeh MS, Jamous RM, Arráez-Román D, Segura-Carretero A. 2015. HPLC–DAD–ESI-MS/MS screening of bioactive components from *Rhus coriaria* L.(Sumac) fruits. *Food Chemistry* 166:179-191.
- Abu-Reidah IM, Arráez-Román D, Warad I, Fernández-Gutiérrez A, Segura-Carretero A. 2017. UHPLC/MS₂-based approach for the comprehensive metabolite profiling of bean (*Vicia faba* L.) by-products: a promising source of bioactive constituents. *Food Research International* 93:87-96.
- Abu-Reidah IM, del Mar Contreras M, Arráez-Román D, Fernández-Gutiérrez A, Segura-Carretero A. 2014. UHPLC-ESI-QTOF-MS-based metabolic profiling of *Vicia faba* L.(Fabaceae) seeds as a key strategy for characterization in foodomics. *Electrophoresis* 35(11):1571-1581.
- Adams RP, Sparkman OD. 2007. Review of Identification of Essential Oil Components by Gas Chromatography/Mass Spectrometry. *J Am Soc Mass Spectrom* 18:803-806.
- Adya AK, Canetta E, Walker GM. 2005. Atomic force microscopic study of the influence of physical stresses on *Saccharomyces cerevisiae* and *Schizosaccharomyces pombe*. *FEMS yeast research* 6(1):120-128.

School of Biochemical Engineering, IIT(BHU) Varanasi

- Aggarwal BB, Shishodia S. 2006. Molecular targets of dietary agents for prevention and therapy of cancer. *Biochemical pharmacology* 71(10):1397-1421.
- Ali Asgar M. 2013. Anti-diabetic potential of phenolic compounds: A review. *International Journal of Food Properties* 16(1):91-103.
- Ali Asgar M. 2013. Anti-diabetic potential of phenolic compounds: A review. *International Journal of Food Properties* 16(1):91-103.
- Allam AE, Nafady AM, Nakagawa T, Takemoto N, Shimizu K. 2017. Effect of polyphenols from Vicia faba L on lipase activity and melanogenesis. *Natural product research*:1-6.
- Altemimi A, Lakhssassi N, Baharlouei A, Watson D, Lightfoot D. 2017. Phytochemicals: Extraction, isolation, and identification of bioactive compounds from plant extracts. *Plants* 6(4):42.
- Altemimi A, Lakhssassi N, Baharlouei A, Watson DG, Lightfoot DA. 2017b. Phytochemicals Extraction, isolation, and identification of bioactive compounds from plant extracts. *Plants* 6(4):42.
- AMAROWICZ R, KARAMAC M, KMITA-GLAZEWSKA H, TROSZYNASKA A, KOZLOWSKA H. 1996. Antioxidant activity of phenolic fractions of everlasting pea, faba bean and broad bean. *Journal of Food Lipids* 3(3):199-211.
- Amarowicz R, Pegg RB. 2008. Legumes as a source of natural antioxidants. European *Journal of Lipid Science and Technology* 110(10):865-878.
- Amarowicz R, Pegg RB. 2008. Legumes as a source of natural antioxidants. European *Journal of Lipid Science and Technology* 110(10):865-878.
- Amarowicz R, Shahidi F. 2017. Antioxidant activity of broad bean seed extract and its phenolic composition. *Journal of Functional Foods*.

- Amber-Vitos O, Chaturvedi N, Nachliel E, Gutman M, Tsfadia Y. 2016. The effect of regulating molecules on the structure of the PPAR-RXR complex. *Biochimica et Biophysica Acta (BBA)-Molecular and Cell Biology of Lipids* 1861(11):1852-1863.
- An S, Bagul M, Parabia M, Rajani M. 2008. Evaluation of free radical scavenging activity of an ayurvedic formulation, Panchvalkala. *Indian journal of pharmaceutical sciences* 70(1):31.
- Anari MR, Sanchez RI, Bakhtiar R, Franklin RB, Baillie TA. 2004. Integration of knowledge-based metabolic predictions with liquid chromatography data-dependent tandem mass spectrometry for drug metabolism studies: application to studies on the biotransformation of indinavir. *Analytical chemistry* 76(3):823-832.
- Apostolidis E, Kwon Y-I, Shetty K. 2007. Inhibitory potential of herb, fruit, and fungal-enriched cheese against key enzymes linked to type 2 diabetes and hypertension. *Innovative Food Science & Emerging Technologies* 8(1):46-54.
- Apostolidis E, Lee C. 2010. In vitro potential of *Ascophyllum nodosum* phenolic antioxidant-mediated α -glucosidase and α -amylase inhibition. *Journal of food science* 75(3):H97-H102.
- Aqil F, Ahmad I, Mehmood Z. 2006. Antioxidant and free radical scavenging properties of twelve traditionally used Indian medicinal plants. *Turkish journal of Biology* 30(3):177-183.
- Araya Barrantes JJ. 2012. Phase-Trafficking Methods in Natural Products, Modulators of Organic Anion Transporting Polypeptides from *Rollinia emarginata*, and Pregnane and Cardiac Glycosides from *Asclepias* spp: University of Kansas.

- Asmat U, Abad K, Ismail K. 2016. Diabetes mellitus and oxidative stress—a concise review. *Saudi Pharmaceutical Journal* 24(5):547-553.
- Asp E, Fernandez K. 2011. The effect of different extraction techniques on extraction yield, total phenolic, and anti-radical capacity of extracts from Pinus radiata Bark. *Industrial Crops and Products* 34(1):838-844.
- Ayachi H, Merad M, Ghalem S. 2013. Study of interaction between dipeptidyl peptidase-4 and products extracted from the stevia plant by molecular modeling. *Int J Pharm Sci Rev Res* 23:87-90.
- Aydn A, Orhan H, Sayal A, zata M, ahin G, simer A. 2001. Oxidative stress and nitric oxide related parameters in type II diabetes mellitus: effects of glycemic control. *Clinical biochemistry* 34(1):65-70.
- Baginsky C, Pea-Neira , Caceres A, Hernandez T, Estrella I, Morales H, Pertuz R. 2013. Phenolic compound composition in immature seeds of fava bean (*Vicia faba* L.) varieties cultivated in Chile. *Journal of food composition and analysis* 31(1):1-6.
- Baginsky C, Pea-Neira , Caceres A, Hernandez T, Estrella I, Morales H, Pertuz R. 2013. Phenolic compound composition in immature seeds of fava bean (*Vicia faba* L.) varieties cultivated in Chile. *Journal of food composition and analysis* 31(1):1-6.
- Baginsky C, Pea-Neira , Caceres A, Hernandez T, Estrella I, Morales H, Pertuz R. 2013. Phenolic compound composition in immature seeds of fava bean (*Vicia faba* L.) varieties cultivated in Chile. *Journal of food composition and analysis* 31(1):1-6.

- Bahadoran Z, Mirmiran P, Azizi F. 2013. Dietary polyphenols as potential nutraceuticals in management of diabetes: a review. *Journal of diabetes & metabolic disorders* 12(1):43.
- Baret P, Septembre-Malaterre A, Rigoulet M, d'Hellencourt CL, Priault M, Gonthier M-P, Devin A. 2013. Dietary polyphenols preconditioning protects 3T3-L1 preadipocytes from mitochondrial alterations induced by oxidative stress. *The international journal of biochemistry & cell biology* 45(1):167-174.
- Barf T, Vallgårda J, Emond R, Häggström C, Kurz G, Nygren A, Larwood V, Mosialou E, Axelsson K, Olsson R. 2002. Arylsulfonamidothiazoles as a new class of potential antidiabetic drugs. Discovery of potent and selective inhibitors of the 11 β -hydroxysteroid dehydrogenase type 1. *Journal of medicinal chemistry* 45(18):3813-3815.
- Bastos DH, Saldanha LA, Catharino RR, Sawaya A, Cunha IB, Carvalho PO, Eberlin MN. 2007. Phenolic antioxidants identified by ESI-MS from yerba maté (*Ilex paraguariensis*) and green tea (*Camelia sinensis*) extracts. *Molecules* 12(3):423-432.
- Benvenuti S, Pellati F, Melegari Ma, Bertelli D. 2004. Polyphenols, anthocyanins, ascorbic acid, and radical scavenging activity of Rubus, Ribes, and Aronia. *Journal of Food Science* 69(3):FCT164-FCT169.
- Benzie IF, Strain JJ. 1996. The ferric reducing ability of plasma (FRAP) as a measure of "antioxidant power": the FRAP assay. *Analytical biochemistry* 239(1):70-76.
- Birben E, Sahiner UM, Sackesen C, Erzurum S, Kalayci O. 2012. Oxidative stress and antioxidant defense. *World Allergy Organization Journal* 5(1):9.

- Birben E, Sahiner UM, Sackesen C, Erzurum S, Kalayci O. 2012. Oxidative stress and antioxidant defense. *World Allergy Organization Journal* 5(1):9.
- Björntorp P. 1990. " Portal" adipose tissue as a generator of risk factors for cardiovascular disease and diabetes. *Arteriosclerosis, Thrombosis, and Vascular Biology* 10(4):493-496.
- Bleicher KH, Böhm H-J, Müller K, Alanine AI. 2003. A guide to drug discovery: hit and lead generation: beyond high-throughput screening. *Nature reviews Drug discovery* 2(5):369.
- Boles E, Hollenberg CP. 1997. The molecular genetics of hexose transport in yeasts. *FEMS microbiology reviews* 21(1):85-111.
- Bonnefont-Rousselot D. 2004. The role of antioxidant micronutrients in the prevention of diabetic complications. *Treatments in endocrinology* 3(1):41-52.
- Bouchenak M, Lamri-Senhadji M. 2013. Nutritional quality of legumes, and their role in cardiometabolic risk prevention: a review. *Journal of medicinal food* 16(3):185-198.
- Boveris A, Oshino N, Chance B. 1972. The cellular production of hydrogen peroxide. *Biochemical Journal* 128(3):617-630.
- Bravo L. 1998. Polyphenols: chemistry, dietary sources, metabolism, and nutritional significance. *Nutrition reviews* 56(11):317-333.
- Bravo M, Silva S, Coelho A, Boas LV, Bronze M. 2006. Analysis of phenolic compounds in Muscatel wines produced in Portugal. *Analytica Chimica Acta* 563(1-2):84-92.
- Bringezu T, Sharbel T, Weber W. 2011. Grain development and endoreduplication in maize and the impact of heat stress. *Euphytica* 182(3):363.

- Brinzeu T, Sharbel T, Weber W. 2011. Grain development and endoreduplication in maize and the impact of heat stress. *Euphytica* 182(3):363.
- Brownlee M. 2001. Biochemistry and molecular cell biology of diabetic complications. *Nature* 414(6865):813.
- Bullon P, Newman HN, Battino M. 2014. Obesity, diabetes mellitus, atherosclerosis and chronic periodontitis: a shared pathology via oxidative stress and mitochondrial dysfunction? *Periodontology 2000* 64(1):139-153.
- Burhans WC, Weinberger M, Marchetti MA, Ramachandran L, D'Urso G, Huberman JA. 2003. Apoptosis-like yeast cell death in response to DNA damage and replication defects. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis* 532(1):227-243.
- Byczkowska A, Kunikowska A, Kaźmierczak A. 2013. Determination of ACC-induced cell-programmed death in roots of *Vicia faba* ssp. minor seedlings by acridine orange and ethidium bromide staining. *Protoplasma* 250(1):121-128.
- Cadet J, Delatour T, Douki T, Gasparutto D, Pouget J-P, Ravanat J-L, Sauvaigo S. 1999. Hydroxyl radicals and DNA base damage. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis* 424(1):9-21.
- Cartea ME, Francisco M, Soengas P, Velasco P. 2011. Phenolic compounds in Brassica vegetables. *Molecules* 16(1):251-280.
- Ceriello A, Motz E. 2004. Is oxidative stress the pathogenic mechanism underlying insulin resistance, diabetes, and cardiovascular disease? The common soil hypothesis revisited. *Arteriosclerosis, thrombosis, and vascular biology* 24(5):816-823.

- Chau C-F, Chen C-H, Lin C-Y. 2004. Insoluble fiber-rich fractions derived from Averrhoa carambola: hypoglycemic effects determined by in vitro methods. LWT-Food Science and Technology 37(3):331-335.
- Chen L-Q, Hou B-H, Lalonde S, Takanaga H, Hartung ML, Qu X-Q, Guo W-J, Kim J-G, Underwood W, Chaudhuri B. 2010. Sugar transporters for intercellular exchange and nutrition of pathogens. Nature 468(7323):527.
- Chen L-Q, Hou B-H, Lalonde S, Takanaga H, Hartung ML, Qu X-Q, Guo W-J, Kim J-G, Underwood W, Chaudhuri B. 2010. Sugar transporters for intercellular exchange and nutrition of pathogens. Nature 468(7323):527.
- Cheng Y-L, Chang W-L, Lee S-C, Liu Y-G, Lin H-C, Chen C-J, Yen C-Y, Yu D-S, Lin S-Z, Harn H-J. 2003. Acetone extract of Bupleurum scorzonerifolium inhibits proliferation of A549 human lung cancer cells via inducing apoptosis and suppressing telomerase activity. Life sciences 73(18):2383-2394.
- Cheynier V. 2005. Polyphenols in foods are more complex than often thought-. The American journal of clinical nutrition 81(1):223S-229S.
- Choudhary DK, Mishra A. 2017. In vitro and in silico interaction of porcine α -amylase with Vicia faba crude seed extract and evaluation of antidiabetic activity. Bioengineered 8(4):393-403.
- Choudhary DK, Mishra A. 2017. In vitro and in silico interaction of porcine α -amylase with Vicia faba crude seed extract and evaluation of antidiabetic activity. Bioengineered 8(4):393-403.
- Choudhary DK, Mishra A. 2018a. In vitro and in silico interaction of faba bean (Vicia faba L.) seed extract with xanthine oxidase and evaluation of antioxidant activity as a therapeutic potential. Natural product research:1-5.

- Choudhary DK, Mishra A. 2018a. In vitro and in silico interaction of faba bean (*Vicia faba* L.) seed extract with xanthine oxidase and evaluation of antioxidant activity as a therapeutic potential. *Natural product research*:1-5.
- Choudhary DK, Mishra A. 2018b. In vitro investigation of hypoglycemic and oxidative stress properties of fava bean (*Vicia faba* L.) seed extract in *Saccharomyces cerevisiae* 2376. *Preparative Biochemistry and Biotechnology*:1-10.
- Choudhary DK, Mishra A. 2018b. In vitro investigation of hypoglycemic and oxidative stress properties of fava bean (*Vicia faba* L.) seed extract in *Saccharomyces cerevisiae* 2376. *Preparative Biochemistry and Biotechnology*:1-10.
- Chuang C-C, McIntosh MK. 2011. Potential mechanisms by which polyphenol-rich grapes prevent obesity-mediated inflammation and metabolic diseases. *Annual review of nutrition* 31:155-176.
- Cirillo VP. 1962. Mechanism of glucose transport across the yeast cell membrane. *Journal of bacteriology* 84(3):485-491.
- Colberg SR, Sigal RJ, Fernhall B, Regensteiner JG, Blissmer BJ, Rubin RR, Chasan-Taber L, Albright AL, Braun B. 2010. Exercise and type 2 diabetes: the American College of Sports Medicine and the American Diabetes Association: joint position statement. *Diabetes care* 33(12):e147-e167.
- Costantino L, Albasini A, Rastelli G, Benvenuti S. 1992. Activity of polyphenolic crude extracts as scavengers of superoxide radicals and inhibitors of xanthine oxidase. *Planta Medica* 58(04):342-344.
- Crépon K, Marget P, Peyronnet C, Carrouee B, Arese P, Duc G. 2010. Nutritional value of faba bean (*Vicia faba* L.) seeds for feed and food. *Field Crops Research* 115(3):329-339.

- Dai J, Mumper RJ. 2010. Plant phenolics: extraction, analysis and their antioxidant and anticancer properties. *Molecules* 15(10):7313-7352.
- Dallakyan S, Olson AJ. 2015. Small-molecule library screening by docking with PyRx. *Chemical Biology: Methods and Protocols*:243-250.
- Dallakyan S, Olson AJ. 2015. Small-molecule library screening by docking with PyRx. *Chemical Biology*: Springer. p 243-250.
- Darzynkiewicz Z, Bruno S, Del Bino G, Gorczyca W, Hotz M, Lassota P, Traganos F. 1992. Features of apoptotic cells measured by flow cytometry. *Cytometry* 13(8):795-808.
- Daw AE, Kazi HA, Colombo JS, Rowe WG, Williams DW, Waddington RJ, Thomas DW, Moseley R. 2013. Differential cellular and microbial responses to nano-/micron-scale titanium surface roughness induced by hydrogen peroxide treatment. *Journal of biomaterials applications* 28(1):144-160.
- de Mejia EG, Castano-Tostado E, Loarca-Pina G. 1999. Antimutagenic effects of natural phenolic compounds in beans. *Mutation Research/Genetic Toxicology and Environmental Mutagenesis* 441(1):1-9.
- Dea TL. 2011. Pediatric obesity & type 2 diabetes. *MCN: The American Journal of Maternal/Child Nursing* 36(1):42-48.
- Dietrich M, Block G, Hudes M, Morrow JD, Norkus EP, Traber MG, Cross CE, Packer L. 2002. Antioxidant supplementation decreases lipid peroxidation biomarker F2-

- isoprostanes in plasma of smokers. *Cancer Epidemiology and Prevention Biomarkers* 11(1):7-13.
- Donath MY, Størling J, Maedler K, Mandrup-Poulsen T. 2003. Inflammatory mediators and islet β -cell failure: a link between type 1 and type 2 diabetes. *Journal of molecular medicine* 81(8):455-470.
- Du F-Y, Xiao X-H, Luo X-J, Li G-K. 2009. Application of ionic liquids in the microwave-assisted extraction of polyphenolic compounds from medicinal plants. *Talanta* 78(3):1177-1184.
- Duan X-J, Zhang W-W, Li X-M, Wang B-G. 2006. Evaluation of antioxidant property of extract and fractions obtained from a red alga, *Polysiphonia urceolata*. *Food Chemistry* 95(1):37-43.
- Duenas M, Hernandez T, Estrella I. 2006. Assessment of in vitro antioxidant capacity of the seed coat and the cotyledon of legumes in relation to their phenolic contents. *Food Chemistry* 98(1):95-103.
- Duh P-D, Tu Y-Y, Yen G-C. 1999. Antioxidant activity of water extract of Harng Jyur (*Chrysanthemum morifolium* Ramat). *LWT-Food Science and Technology* 32(5):269-277.
- Dyer KM, Perkyns JS, Stell G, Montgomery Pettitt B. 2009. Site-renormalised molecular fluid theory: on the utility of a two-site model of water. *Molecular physics* 107(4-6):423-431.
- Dyer KM, Perkyns JS, Stell G, Montgomery Pettitt B. 2009. Site-renormalised molecular fluid theory: on the utility of a two-site model of water. *Molecular physics* 107(4-6):423-431.

- Dykes L, Rooney L. 2007. Phenolic compounds in cereal grains and their health benefits. *Cereal foods world* 52(3):105-111.
- Eichler H, Korn A, Gasic S, Pirson W, Businger J. 1984. The effect of a new specific α -amylase inhibitor on post-prandial glucose and insulin excursions in normal subjects and type 2 (non-insulin-dependent) diabetic patients. *Diabetologia* 26(4):278-281.
- Emmerson BT. 1996. The management of gout. *New England Journal of Medicine* 334(7):445-451.
- Eshwarappa RSB, Iyer RS, Subbaramaiah SR, Richard SA, Dhananjaya BL. 2014. Antioxidant activity of Syzygium cumini leaf gall extracts. *BioImpacts: BI* 4(2):101.
- Essmann U, Perera L, Berkowitz ML, Darden T, Lee H, Pedersen LG. 1995. A smooth particle mesh Ewald method. *The Journal of chemical physics* 103(19):8577-8593.
- Evans WC. 2002. Trease and evans. WB Saunders Harcourt Publishers Ltd 292:357-375.
- Fecka I. 2009. Qualitative and quantitative determination of hydrolysable tannins and other polyphenols in herbal products from meadowsweet and dog rose. *Phytochemical Analysis* 20(3):177-190.
- Ferreira Antunes M, Eggimann F, Kittelmann M, Luetz S, Hanlon SP, Wirz B, Bachler T, Winkler M. 2016. Human xanthine oxidase recombinant in *E. coli*: a whole cell catalyst for preparative drug metabolites synthesis. *Journal of biotechnology*.
- Forester SC, Lambert JD. 2011. The role of antioxidant versus pro-oxidant effects of green tea polyphenols in cancer prevention. *Molecular nutrition & food research* 55(6):844-854.

- Gan RY, Shah NP, Wang MF, Lui WY, Corke H. 2016. Fermentation alters antioxidant capacity and polyphenol distribution in selected edible legumes. International journal of food science & technology 51(4):875-884.
- Gao W, Wang Y, Basavanagoud B, Jamil MK. 2017. Characteristics studies of molecular structures in drugs. Saudi Pharmaceutical Journal 25(4):580-586.
- Ghasemzadeh A, Ghasemzadeh N. 2011. Flavonoids and phenolic acids: Role and biochemical activity in plants and human. Journal of medicinal plants research 5(31):6697-6703.
- Giugliano D, Ceriello A, Paolisso G. 1995. Diabetes mellitus, hypertension, and cardiovascular disease: which role for oxidative stress? Metabolism-Clinical and Experimental 44(3):363-368.
- Glantzounis G, Tsimoyiannis E, Kappas A, Galaris D. 2005. Uric acid and oxidative stress. Current pharmaceutical design 11(32):4145-4151.
- Goel R, Bhatia D, Gilani SJ, Katiyar D. 2012. Medicinal plants as antidiabetics, A review. Int Bull Drug Res 1(2):100-107.
- Goh S-Y, Cooper ME. 2008. The role of advanced glycation end products in progression and complications of diabetes. The Journal of Clinical Endocrinology & Metabolism 93(4):1143-1152.
- Grigoris D, Venskutonis P, Sivik B, Sandahl M, Eskilsson C. 2005. Comparison of different extraction techniques for isolation of antioxidants from sweet grass (*Hierochloe odorata*). The Journal of Supercritical Fluids 33(3):223-233.
- Gülçin I, Küfrevoioğlu ÖI, Oktay M, Büyükkokuroğlu ME. 2004. Antioxidant, antimicrobial, antiulcer and analgesic activities of nettle (*Urtica dioica L.*). Journal of ethnopharmacology 90(2):205-215.

- Guo C, Yang J, Wei J, Li Y, Xu J, Jiang Y. 2003. Antioxidant activities of peel, pulp and seed fractions of common fruits as determined by FRAP assay. Nutrition Research 23(12):1719-1726.
- Gurib-Fakim A. 2006. Medicinal plants: traditions of yesterday and drugs of tomorrow. Molecular aspects of Medicine 27(1):1-93.
- Hanelt P, Mettin D. 1989. Biosystematics of the genus Vicia L.(Leguminosae). Annual review of ecology and systematics 20(1):199-223.
- Hanelt P, Mettin D. 1989. Biosystematics of the genus Vicia L.(Leguminosae). Annual review of ecology and systematics 20(1):199-223.
- He Q, Lv Y, Yao K. 2007. Effects of tea polyphenols on the activities of α -amylase, pepsin, trypsin and lipase. Food Chemistry 101(3):1178-1182.
- He Q, Shi B, Yao K. 2006. Interactions of gallotannins with proteins, amino acids, phospholipids and sugars. Food Chemistry 95(2):250-254.
- Heim KE, Tagliaferro AR, Bobilya DJ. 2002. Flavonoid antioxidants: chemistry, metabolism and structure-activity relationships. The Journal of nutritional biochemistry 13(10):572-584.
- Hemingway RW, Laks PE. 2012. Plant polyphenols: synthesis, properties, significance: Springer Science & Business Media.
- Hermans M, Kroos M, Van Beeumen J, Oostra B, Reuser A. 1991. Human lysosomal alpha-glucosidase. Characterization of the catalytic site. Journal of Biological Chemistry 266(21):13507-13512.
- Hess B, Bekker H, Berendsen HJ, Fraaije JG. 1997. LINCS: a linear constraint solver for molecular simulations. Journal of computational chemistry 18(12):1463-1472.

- Hess B, Bekker H, Berendsen HJ, Fraaije JG. 1997. LINCS: a linear constraint solver for molecular simulations. *Journal of computational chemistry* 18(12):1463-1472.
- Huang Y, Chen J, Jiang T, Zhou Z, Lv B, Yin G, Fan J. 2017. Gallic acid inhibits the release of ADAMTS4 in nucleus pulposus cells by inhibiting p65 phosphorylation and acetylation of the NF-κB signaling pathway. *Oncotarget* 8(29):47665.
- Ignat I, Volf I, Popa VI. 2011. A critical review of methods for characterisation of polyphenolic compounds in fruits and vegetables. *Food Chemistry* 126(4):1821-1835.
- Jakopič J, Veberič R, Štampar F. 2009. Extraction of phenolic compounds from green walnut fruits in different solvents. *Acta Agric Slov* 93(1):11-15.
- Jhong CH, Riyaphan J, Lin SH, Chia YC, Weng CF. 2015. Screening alpha-glucosidase and alpha-amylase inhibitors from natural compounds by molecular docking in silico. *BioFactors* 41(4):242-251.
- Joana Gil-Chávez G, Villa JA, Fernando Ayala-Zavala J, Basilio Heredia J, Sepulveda D, Yahia EM, González-Aguilar GA. 2013. Technologies for extraction and production of bioactive compounds to be used as nutraceuticals and food ingredients: an overview. *Comprehensive Reviews in Food Science and Food Safety* 12(1):5-23.
- Jordinson M, El-Hariry I, Calnan Da, Calam J, Pignatelli M. 1999. *Vicia faba* agglutinin, the lectin present in broad beans, stimulates differentiation of undifferentiated colon cancer cells. *Gut* 44(5):709-714.
- Kale AS, Patil AS, Paikrao H, Patil SR. 2018. Characterization and Purification of Antiulcerolytic Metabolites from Medicinal Plants. *Ethnobotany: Application of Medicinal Plants*.

- Kalita D, Holm DG, LaBarbera DV, Petrash JM, Jayanty SS. 2018. Inhibition of α -glucosidase, α -amylase, and aldose reductase by potato polyphenolic compounds. *PloS one* 13(1):e0191025.
- Kapetanovic I. 2008. Computer-aided drug discovery and development (CADD): in silico-chemico-biological approach. *Chemico-biological interactions* 171(2):165-176.
- Karar M, Kuhnert N. 2015. UPLC-ESI-Q-TOF-MS/MS characterization of phenolics from Crataegus monogyna and Crataegus laevigata (Hawthorn) leaves, fruits and their herbal derived drops (Crataegutt Tropfen). *J Chem Biol Ther* 1:102.
- Karlström B, Vessby B, Asp N, Boberg M, Lithell H, Berne C. 1987. Effects of leguminous seeds in a mixed diet in non-insulin-dependent diabetic patients. *Diabetes research (Edinburgh, Scotland)* 5(4):199-205.
- Kaur M. 2016. Chemistry and biological activity of flavonoids from zest and pith of kinnow peel: Punjab Agricultural University Ludhiana.
- Kaur M. 2016. Chemistry and biological activity of flavonoids from zest and pith of kinnow peel: Punjab Agricultural University Ludhiana.
- Kawakami K, Aketa S, Nakanami M, Iizuka S, Hirayama M. 2010. Major water-soluble polyphenols, proanthocyanidins, in leaves of persimmon (*Diospyros kaki*) and their α -amylase inhibitory activity. *Bioscience, biotechnology, and biochemistry* 74(7):1380-1385.
- Kazeem M, Adamson J, Ogunwande I. 2013. Modes of inhibition of α -amylase and α -glucosidase by aqueous extract of *Morinda lucida* Benth leaf. *BioMed research international* 2013.

- Kazeem M, Adamson J, Ogunwande I. 2013a. Modes of inhibition of α -amylase and α -glucosidase by aqueous extract of *Morinda lucida* Benth leaf. BioMed research international 2013.
- Kazeem MI, Ogunbiyi JV, Ashafa A. 2013b. In vitro Studies on the Inhibition of α -Amylase and α -Glucosidase by Leaf Extracts of *Picralima nitida* (Stapf). Tropical Journal of Pharmaceutical Research 12(5):719-725.
- Keston AS, Brandt R. 1965. The fluorometric analysis of ultramicro quantities of hydrogen peroxide. Analytical biochemistry 11(1):1-5.
- Kim K, Nam K, Kurihara H, Kim S. 2008. Potent α -glucosidase inhibitors purified from the red alga *Gratelouphia elliptica*. Phytochemistry 69(16):2820-2825.
- Koh LW, Wong LL, Loo YY, Kasapis S, Huang D. 2009. Evaluation of different teas against starch digestibility by mammalian glycosidases. Journal of agricultural and food chemistry 58(1):148-154.
- Kumar RV, Sinha VR. 2012. Newer insights into the drug delivery approaches of α -glucosidase inhibitors. Expert opinion on drug delivery 9(4):403-416.
- KWON YI, Apostolidis E, Shetty K. 2007. Evaluation of pepper (*Capsicum annuum*) for management of diabetes and hypertension. Journal of food biochemistry 31(3):370-385.
- KWON YI, Apostolidis E, Shetty K. 2008. Inhibitory potential of wine and tea against α -amylase and α -glucosidase for management of hyperglycemia linked to type 2 diabetes. Journal of Food Biochemistry 32(1):15-31.
- KWON YI, Apostolidis E, Shetty K. 2008. Inhibitory potential of wine and tea against α -amylase and α -glucosidase for management of hyperglycemia linked to type 2 diabetes. Journal of Food Biochemistry 32(1):15-31.

- Laskowski RA, Swindells MB. 2011. LigPlot+: multiple ligand–protein interaction diagrams for drug discovery. ACS Publications.
- Laskowski RA, Swindells MB. 2011. LigPlot+: multiple ligand–protein interaction diagrams for drug discovery. ACS Publications.
- Lattanzio V. 2013. Phenolic compounds: introduction. Natural products: Springer. p 1543-1580.
- Lee JS, Kim DH, Liu KH, Oh TK, Lee CH. 2005. Identification of flavonoids using liquid chromatography with electrospray ionization and ion trap tandem mass spectrometry with an MS/MS library. Rapid Communications in Mass Spectrometry 19(23):3539-3548.
- Lee JS, Kim DH, Liu KH, Oh TK, Lee CH. 2005. Identification of flavonoids using liquid chromatography with electrospray ionization and ion trap tandem mass spectrometry with an MS/MS library. Rapid Communications in Mass Spectrometry 19(23):3539-3548.
- Lee RJ, Lee VS, Tzen JT, Lee MR. 2010. Study of the release of gallic acid from (–)-epigallocatechin gallate in old oolong tea by mass spectrometry. Rapid Communications in Mass Spectrometry: An International Journal Devoted to the Rapid Dissemination of Up-to-the-Minute Research in Mass Spectrometry 24(7):851-858.
- Lee RJ, Lee VS, Tzen JT, Lee MR. 2010. Study of the release of gallic acid from (–)-epigallocatechin gallate in old oolong tea by mass spectrometry. Rapid Communications in Mass Spectrometry: An International Journal Devoted to the

- Rapid Dissemination of Up-to-the-Minute Research in Mass Spectrometry
24(7):851-858.
- Lee S, Lee I, Kim H, Chang G, Chung J, No K. 2003. The PreADME Approach: Web-based program for rapid prediction of physico-chemical, drug absorption and drug-like properties. EuroQSAR 2002 Designing Drugs and Crop Protectants: processes, problems and solutions 2003:418-420.
- Li X, Lü Z-R, Shen D, Zhan Y, Yang J-M, Park Y-D, Zhou H-M, Sheng Q, Lee J. 2014. The inhibitory role of Co²⁺ on α-glucosidase: Inhibition kinetics and molecular dynamics simulation integration study. Process Biochemistry 49(11):1913-1919.
- Lipinski CA, Lombardo F, Dominy BW, Feeney PJ. 1997. Experimental and computational approaches to estimate solubility and permeability in drug discovery and development settings. Advanced drug delivery reviews 23(1-3):3-25.
- Liu RH. 2004. Potential synergy of phytochemicals in cancer prevention: mechanism of action. The Journal of nutrition 134(12):3479S-3485S.
- Liu Y, Chan F, Sun H, Yan J, Fan D, Zhao D, An J, Zhou D. 2011. Resveratrol protects human keratinocytes HaCaT cells from UVA-induced oxidative stress damage by downregulating Keap1 expression. European journal of pharmacology 650(1):130-137.
- Lo Piparo E, Scheib H, Frei N, Williamson G, Grigorov M, Chou CJ. 2008. Flavonoids for controlling starch digestion: structural requirements for inhibiting human α-amylase. Journal of medicinal chemistry 51(12):3555-3561.

- Lo Piparo E, Scheib H, Frei N, Williamson G, Grigorov M, Chou CJ. 2008. Flavonoids for controlling starch digestion: structural requirements for inhibiting human α -amylase. *Journal of medicinal chemistry* 51(12):3555-3561.
- Macías FA, Galindo JL, Galindo JC. 2007. Evolution and current status of ecological phytochemistry. *Phytochemistry* 68(22-24):2917-2936.
- Mandal V, Mohan Y, Hemalatha S. 2007. Microwave assisted extraction—an innovative and promising extraction tool for medicinal plant research. *Pharmacognosy reviews* 1(1):7-18.
- Markom M, Hasan M, Daud WRW, Singh H, Jahim JM. 2007. Extraction of hydrolysable tannins from *Phyllanthus niruri* Linn.: Effects of solvents and extraction methods. *Separation and purification technology* 52(3):487-496
- Mathers CD, Loncar D. 2006. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS medicine* 3(11):e442.
- Mattila P, Pihlava J-m, Hellström J. 2005. Contents of phenolic acids, alkyl-and alkenylresorcinols, and avenanthramides in commercial grain products. *Journal of agricultural and food chemistry* 53(21):8290-8295.
- Mazlan NSF, Ahmad Khairudin NB. 2016. A molecular dynamics study of Beta-Glucosidase B upon small substrate binding. *Journal of Biomolecular Structure and Dynamics* 34(7):1486-1494.
- McConkey BJ, Sobolev V, Edelman M. 2002. The performance of current methods in ligand–protein docking. *Current Science*:845-856.
- McCord JM. 2000. The evolution of free radicals and oxidative stress. *The American journal of medicine* 108(8):652-659.

- McCue P, Vattem D, Shetty K. 2004. Inhibitory effect of clonal oregano extracts against porcine pancreatic amylase in vitro. *Asia Pacific Journal of Clinical Nutrition* 13(4):401-408.
- McCue PP, Shetty K. 2004. Inhibitory effects of rosmarinic acid extracts on porcine pancreatic amylase in vitro. *Asia Pacific Journal of Clinical Nutrition* 13(1).
- Medić-Šarić M, Jasprica I, Smolčić-Bubalo A, Mornar A. 2004. Optimization of chromatographic conditions in thin layer chromatography of flavonoids and phenolic acids. *Croatica Chemica Acta* 77(1-2):361-366.
- Mejri F, Selmi S, Martins A, Baati T, Chaabane H, Njim L, Serralheiro ML, Rauter AP, Hosni K. 2018. Broad bean (*Vicia faba* L.) pods: a rich source of bioactive ingredients with antimicrobial, antioxidant, enzyme inhibitory, anti-diabetic and health-promoting properties. *Food & function* 9(4):2051-2069.
- Mejri F, Selmi S, Martins A, Baati T, Chaabane H, Njim L, Serralheiro ML, Rauter AP, Hosni K. 2018. Broad bean (*Vicia faba* L.) pods: a rich source of bioactive ingredients with antimicrobial, antioxidant, enzyme inhibitory, anti-diabetic and health-promoting properties. *Food & function* 9(4):2051-2069.
- Meng S, Cao J, Feng Q, Peng J, Hu Y. 2013. Roles of chlorogenic acid on regulating glucose and lipids metabolism: a review. *Evidence-Based Complementary and Alternative Medicine* 2013.
- Meyer AS, Heinonen M, Frankel EN. 1998. Antioxidant interactions of catechin, cyanidin, caffeic acid, quercetin, and ellagic acid on human LDL oxidation. *Food chemistry* 61(1-2):71-75.
- Michalak A. 2006. Phenolic compounds and their antioxidant activity in plants growing under heavy metal stress. *Polish Journal of Environmental Studies* 15(4).

- Mills S, Bone K. 2000. Principles and practice of phytotherapy. Modern herbal medicine: Churchill Livingstone.
- Mishra SK, Yadav B, Upadhyay P, Kumar P, Singh C, Dixit J, Tiwari KN. 2018. LC-ESI MS/MS Profiling, Antioxidant and Anti Epileptic Activity of Luffa cylindrica (L.) Roem Extract. *Journal of Pharmacology and Toxicology* 13:1-18.
- Modak M, Dixit P, Londhe J, Ghaskadbi S, Devasagayam TPA. 2007. Recent advances in Indian herbal drug research guest editor: Thomas Paul Asir Devasagayam Indian herbs and herbal drugs used for the treatment of diabetes. *Journal of clinical biochemistry and nutrition* 40(3):163-173.
- Mogale M, Lebelo SL, Thovhogi N, De Freitas A, Shai L. 2011. α -Amylase and α -glucosidase inhibitory effects of Sclerocarya birrea [(A. Rich.) Hochst.] subspecies caffra (Sond) Kokwaro (Anacardiaceae) stem-bark extracts. *African Journal of Biotechnology* 10(66):15033-15039.
- Mollica A, Zengin G, Durdagi S, Ekhteiari Salmas R, Macedonio G, Stefanucci A, Dimmito MP, Novellino E. 2018. Combinatorial peptide library screening for discovery of diverse α -glucosidase inhibitors using molecular dynamics simulations and binary QSAR models. *Journal of Biomolecular Structure and Dynamics*:1-15.
- Moreno DA, Ilic N, Poulev A, Brasaemle DL, Fried SK, Raskin I. 2003. Inhibitory effects of grape seed extract on lipases. *Nutrition* 19(10):876-879.
- Morris GM, Huey R, Lindstrom W, Sanner MF, Belew RK, Goodsell DS, Olson AJ. 2009. AutoDock4 and AutoDockTools4: Automated docking with selective receptor flexibility. *Journal of computational chemistry* 30(16):2785-2791.

- Morris GM, Huey R, Lindstrom W, Sanner MF, Belew RK, Goodsell DS, Olson AJ. 2009. AutoDock4 and AutoDockTools4: Automated docking with selective receptor flexibility. *Journal of computational chemistry* 30(16):2785-2791.
- Mukherjee PK, Wahile A. 2006. Integrated approaches towards drug development from Ayurveda and other Indian system of medicines. *Journal of ethnopharmacology* 103(1):25-35.
- Mulvihill EE, Huff MW. 2010. Antiatherogenic properties of flavonoids: implications for cardiovascular health. *Canadian Journal of Cardiology* 26:17A-21A.
- Nabavi SM, Nabavi SF, Eslami S, Moghaddam AH. 2012. In vivo protective effects of quercetin against sodium fluoride-induced oxidative stress in the hepatic tissue. *Food Chemistry* 132(2):931-935.
- Naczk M, Shahidi F. 2006. Phenolics in cereals, fruits and vegetables: Occurrence, extraction and analysis. *Journal of pharmaceutical and biomedical analysis* 41(5):1523-1542.
- Nakashima N, Sharma PM, Imamura T, Bookstein R, Olefsky JM. 2000. The tumor suppressor PTEN negatively regulates insulin signaling in 3T3-L1 adipocytes. *Journal of Biological Chemistry* 275(17):12889-12895.
- Nathan DM, Buse JB, Davidson MB, Ferrannini E, Holman RR, Sherwin R, Zinman B. 2009. Medical management of hyperglycemia in type 2 diabetes: a consensus algorithm for the initiation and adjustment of therapy: a consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes care* 32(1):193-203.
- Neužil P, Giselbrecht S, Länge K, Huang TJ, Manz A. 2012. Revisiting lab-on-a-chip technology for drug discovery. *Nature reviews Drug discovery* 11(8):620.

- Newsholme P, Haber E, Hirabara S, Rebelato E, Procopio J, Morgan D, Oliveira-Emilio H, Carpinelli A, Curi R. 2007. Diabetes associated cell stress and dysfunction: role of mitochondrial and non-mitochondrial ROS production and activity. *The Journal of physiology* 583(1):9-24.
- Nguyen MTT, Awale S, Tezuka Y, Le Tran Q, Kadota S. 2005. Xanthine oxidase inhibitors from the heartwood of Vietnamese Caesalpinia sappan. *Chemical and pharmaceutical bulletin* 53(8):984-988.
- Nile SH, Park SW. 2015. Chromatographic analysis, antioxidant, anti-inflammatory, and xanthine oxidase inhibitory activities of ginger extracts and its reference compounds. *Industrial Crops and Products* 70:238-244.
- Nyambe-Silavwe H, Villa-Rodriguez JA, Ifie I, Holmes M, Aydin E, Jensen JM, Williamson G. 2015. Inhibition of human α -amylase by dietary polyphenols. *Journal of Functional Foods* 19:723-732.
- Obiro WC, Zhang T, Jiang B. 2008. The nutraceutical role of the Phaseolus vulgaris α -amylase inhibitor. *British journal of nutrition* 100(1):1-12.
- Oboh G, Ademiluyi AO, Akinyemi AJ, Henle T, Saliu JA, Schwarzenbolz U. 2012. Inhibitory effect of polyphenol-rich extracts of jute leaf (*Corchorus olitorius*) on key enzyme linked to type 2 diabetes (α -amylase and α -glucosidase) and hypertension (angiotensin I converting) in vitro. *Journal of Functional Foods* 4(2):450-458.
- O'Boyle NM, Banck M, James CA, Morley C, Vandermeersch T, Hutchison GR. 2011. Open Babel: An open chemical toolbox. *Journal of cheminformatics* 3(1):33.
- O'Boyle NM, Banck M, James CA, Morley C, Vandermeersch T, Hutchison GR. 2011. Open Babel: An open chemical toolbox. *Journal of cheminformatics* 3(1):33.

- O'Boyle NM, Banck M, James CA, Morley C, Vandermeersch T, Hutchison GR. 2011. Open Babel: An open chemical toolbox. *Journal of cheminformatics* 3(1):33.
- Ogunwande IA, Matsui T, Fujise T, Matsumoto K. 2007. α -Glucosidase inhibitory profile of Nigerian medicinal plants in immobilized assay system. *Food science and technology research* 13(2):169-172.
- Ong S-Q, Lee B-B, Tan G-P. 2017. Capacity of black soldier fly and house fly larvae in treating the wasted rice in Malaysia.
- Oostenbrink C, Villa A, Mark AE, Van Gunsteren WF. 2004. A biomolecular force field based on the free enthalpy of hydration and solvation: the GROMOS force-field parameter sets 53A5 and 53A6. *Journal of computational chemistry* 25(13):1656-1676.
- Oostenbrink C, Villa A, Mark AE, Van Gunsteren WF. 2004. A biomolecular force field based on the free enthalpy of hydration and solvation: the GROMOS force-field parameter sets 53A5 and 53A6. *Journal of computational chemistry* 25(13):1656-1676.
- Oostenbrink C, Villa A, Mark AE, Van Gunsteren WF. 2004. A biomolecular force field based on the free enthalpy of hydration and solvation: the GROMOS force-field parameter sets 53A5 and 53A6. *Journal of computational chemistry* 25(13):1656-1676.
- Ou B, Huang D, Hampsch-Woodill M, Flanagan JA, Deemer EK. 2002. Analysis of antioxidant activities of common vegetables employing oxygen radical absorbance capacity (ORAC) and ferric reducing antioxidant power (FRAP) assays: a comparative study. *Journal of agricultural and food chemistry* 50(11):3122-3128.

- Owen PL, Johns T. 1999. Xanthine oxidase inhibitory activity of northeastern North American plant remedies used for gout. *Journal of ethnopharmacology* 64(2):149-160.
- Oyaizu M. 1986. Studies on products of browning reaction. *The Japanese Journal of Nutrition and Dietetics* 44(6):307-315.
- Pandey KB, Rizvi SI. 2009. Plant polyphenols as dietary antioxidants in human health and disease. *Oxidative medicine and cellular longevity* 2(5):270-278.
- Panickar KS, Anderson RA. 2011. Effect of polyphenols on oxidative stress and mitochondrial dysfunction in neuronal death and brain edema in cerebral ischemia. *International Journal of Molecular Sciences* 12(11):8181-8207.
- Park H, Hwang KY, Kim YH, Oh KH, Lee JY, Kim K. 2008. Discovery and biological evaluation of novel α -glucosidase inhibitors with in vivo antidiabetic effect. *Bioorganic & medicinal chemistry letters* 18(13):3711-3715.
- Patel D, Kumar R, Laloo D, Hemalatha S. 2012. Natural medicines from plant source used for therapy of diabetes mellitus: An overview of its pharmacological aspects. *Asian Pacific Journal of Tropical Disease* 2(3):239-250.
- Pettersen EF, Goddard TD, Huang CC, Couch GS, Greenblatt DM, Meng EC, Ferrin TE. 2004. UCSF Chimera—a visualization system for exploratory research and analysis. *Journal of computational chemistry* 25(13):1605-1612.
- Pettersen EF, Goddard TD, Huang CC, Couch GS, Greenblatt DM, Meng EC, Ferrin TE. 2004. UCSF Chimera—a visualization system for exploratory research and analysis. *Journal of computational chemistry* 25(13):1605-1612.
- Picard F, Auwerx J. 2002. PPAR γ and glucose homeostasis. *Annual review of nutrition* 22(1):167-197.

- Pietta P-G. 2000. Flavonoids as antioxidants. *Journal of natural products* 63(7):1035-1042.
- Pinto-Junior VR, Osterne VJS, Santiago MQ, Correia JLA, Pereira-Junior FN, Leal RB, Pereira MG, Chicas LS, Nagano CS, Rocha BAM. 2017. Structural studies of a vasorelaxant lectin from Dioclea reflexa Hook seeds: Crystal structure, molecular docking and dynamics. *International journal of biological macromolecules* 98:12-23.
- Pourcel L, Routaboul J-M, Cheynier V, Lepiniec L, Debeaujon I. 2007. Flavonoid oxidation in plants: from biochemical properties to physiological functions. *Trends in plant science* 12(1):29-36.
- Prior RL, Cao G, Martin A, Sofic E, McEwen J, O'Brien C, Lischner N, Ehlenfeldt M, Kalt W, Krewer G. 1998. Antioxidant capacity as influenced by total phenolic and anthocyanin content, maturity, and variety of Vaccinium species. *Journal of agricultural and food chemistry* 46(7):2686-2693.
- Pronk S, Páll S, Schulz R, Larsson P, Bjelkmar P, Apostolov R, Shirts MR, Smith JC, Kasson PM, Van Der Spoel D. 2013. GROMACS 4.5: a high-throughput and highly parallel open source molecular simulation toolkit. *Bioinformatics* 29(7):845-854.
- Puddu P, Puddu GM, Cravero E, Vizioli L, Muscari A. 2012. The relationships among hyperuricemia, endothelial dysfunction, and cardiovascular diseases: molecular mechanisms and clinical implications. *Journal of cardiology* 59(3):235-242
- Rabey J, Vered Y, Shabtai H, Graff E, Harsat A, Korczyn A. 1993. Broad bean (*Vicia faba*) consumption and Parkinson's disease. *Advances in neurology* 60:681-684.

- Rahimi R, Nikfar S, Larijani B, Abdollahi M. 2005. A review on the role of antioxidants in the management of diabetes and its complications. *Biomedicine & Pharmacotherapy* 59(7):365-373.
- Rahimi R, Nikfar S, Larijani B, Abdollahi M. 2005. A review on the role of antioxidants in the management of diabetes and its complications. *Biomedicine & Pharmacotherapy* 59(7):365-373.
- Rahman I, Biswas SK, Kirkham PA. 2006. Regulation of inflammation and redox signaling by dietary polyphenols. *Biochemical pharmacology* 72(11):1439-1452.
- Resch M, Steigel A, Chen Z-l, Bauer R. 1998. 5-Lipoxygenase and cyclooxygenase-1 inhibitory active compounds from *Atractylodes lancea*. *Journal of natural products* 61(3):347-350.
- Rice-Evans C, Miller N, Paganga G. 1997. Antioxidant properties of phenolic compounds. *Trends in plant science* 2(4):152-159.
- Rice-Evans CA, Miller NJ, Paganga G. 1996. Structure-antioxidant activity relationships of flavonoids and phenolic acids. *Free Radical Biology and Medicine* 20(7):933-956.
- Rizkalla SW, Bellisle F, Slama G. 2002. Health benefits of low glycaemic index foods, such as pulses, in diabetic patients and healthy individuals. *British journal of nutrition* 88(S3):255-262.
- Robards K. 2003. Strategies for the determination of bioactive phenols in plants, fruit and vegetables. *Journal of chromatography A* 1000(1-2):657-691.
- Robards K. 2003. Strategies for the determination of bioactive phenols in plants, fruit and vegetables. *Journal of chromatography A* 1000(1-2):657-691.

- Sabu M, Smitha K, Kuttan R. 2002. Anti-diabetic activity of green tea polyphenols and their role in reducing oxidative stress in experimental diabetes. *Journal of ethnopharmacology* 83(1-2):109-116.
- Saklani A, Kutty SK. 2008. Plant-derived compounds in clinical trials. *Drug discovery today* 13(3-4):161-171.
- Sales PM, Souza PM, Simeoni LA, Magalhães PO, Silveira D. 2012. α -Amylase inhibitors: a review of raw material and isolated compounds from plant source. *Journal of Pharmacy & Pharmaceutical Sciences* 15(1):141-183.
- Sanner MF. 1999. Python: a programming language for software integration and development. *J Mol Graph Model* 17(1):57-61.
- Sarabhai S, Sharma P, Capalash N. 2013. Ellagic acid derivatives from Terminalia chebula Retz. downregulate the expression of quorum sensing genes to attenuate *Pseudomonas aeruginosa* PAO1 virulence. *PLoS one* 8(1):e53441.
- Sarkar S. 2015. Design synthesis and evaluation of anti-inflammatory activity of gallic acid derivatives. Sandberg A-S. 2002. Bioavailability of minerals in legumes. *British journal of nutrition* 88(S3):281-285.
- Sarker KP, Obara S, Nakata M, Kitajima I, Maruyama I. 2000. Anandamide induces apoptosis of PC-12 cells: Involvement of superoxide and caspase-3. *FEBS letters* 472(1):39-44.
- Scalbert A, Manach C, Morand C, Rémésy C, Jiménez L. 2005. Dietary polyphenols and the prevention of diseases. *Critical reviews in food science and nutrition* 45(4):287-306.
- Scartezzini P, Speroni E. 2000. Review on some plants of Indian traditional medicine with antioxidant activity. *Journal of ethnopharmacology* 71(1-2):23-43.

- Scheepers A, Joost H-G, Schurmann A. 2004. The glucose transporter families SGLT and GLUT: molecular basis of normal and aberrant function. *Journal of Parenteral and Enteral Nutrition* 28(5):364-371.
- Schofield P, Mbugua D, Pell A. 2001. Analysis of condensed tannins: a review. *Animal feed science and technology* 91(1-2):21-40.
- Schüttelkopf AW, Van Aalten DM. 2004. PRODRG: a tool for high-throughput crystallography of protein–ligand complexes. *Acta Crystallographica Section D: Biological Crystallography* 60(8):1355-1363.
- Schüttelkopf AW, Van Aalten DM. 2004. PRODRG: a tool for high-throughput crystallography of protein–ligand complexes. *Acta Crystallographica Section D: Biological Crystallography* 60(8):1355-1363
- Shahidi F, Ambigaipalan P. 2015. Phenolics and polyphenolics in foods, beverages and spices: Antioxidant activity and health effects—A review. *Journal of Functional Foods* 18:820-897.
- Shoaib A, Dixit RK, Badruddeen, Rahman MA, Bagga P, Kaleem S, Siddiqui S, Arshad M, Siddiqui HH. 2018. Cure of human diabetic neuropathy by HPLC validated bark extract of *Onosma echiodoides* L. root. *Natural product research*:1-5.
- Siah SD, Konczak I, Agboola S, Wood JA, Blanchard CL. 2012. In vitro investigations of the potential health benefits of Australian-grown faba beans (*Vicia faba* L.): chemopreventative capacity and inhibitory effects on the angiotensin-converting enzyme, α -glucosidase and lipase. *British Journal of Nutrition* 108(S1):S123-S134.

- Siddhuraju P, Becker K. 2007. The antioxidant and free radical scavenging activities of processed cowpea (*Vigna unguiculata* (L.) Walp.) seed extracts. *Food chemistry* 101(1):10-19.
- Siebert KJ, Troukhanova NV, Lynn PY. 1996. Nature of polyphenol– protein interactions. *Journal of agricultural and food chemistry* 44(1):80-85.
- Silva T, Oliveira C, Borges F. 2014. Caffeic acid derivatives, analogs and applications: A patent review (2009–2013). *Expert opinion on therapeutic patents* 24(11):1257-1270.
- Silverstein RM, Bassler GC, Morrill TC. 1974. Spectrometric identification of organic compounds.
- Singh A, Gupta R, Pandey R. 2017. Exogenous application of rutin and gallic acid regulate antioxidants and alleviate reactive oxygen generation in *Oryza sativa* L. *Physiology and Molecular Biology of Plants* 23(2):301-309.
- Singh AK, Bharati R, Pedpati A. 2013. An assessment of faba bean (*Vicia faba* L.) current status and future prospect. *African Journal of Agricultural Research* 8(50):6634-6641.
- Singh J, Dartois A, Kaur L. 2010. Starch digestibility in food matrix: a review. *Trends in Food Science & Technology* 21(4):168-180
- Singh NP. 2000. Microgels for estimation of DNA strand breaks, DNA protein crosslinks and apoptosis. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis* 455(1):111-127.
- Singleton V, Rossi JA. 1965. Colorimetry of total phenolics with phosphomolybdic-phosphotungstic acid reagents. *American journal of Enology and Viticulture* 16(3):144-158.

- Song JU, Jang JW, Kim TH, Park H, Park WS, Jung S-H, Kim GT. 2016. Structure-based design and biological evaluation of novel 2-(indol-2-yl) thiazole derivatives as xanthine oxidase inhibitors. *Bioorganic & medicinal chemistry letters* 26(3):950-954.
- Spainhour CB. 2010. Natural products. *Pharmaceutical Sciences Encyclopedia: Drug Discovery, Development, and Manufacturing*:1-62.
- Spencer JP, El Mohsen MMA, Minihane A-M, Mathers JC. 2008. Biomarkers of the intake of dietary polyphenols: strengths, limitations and application in nutrition research. *British Journal of Nutrition* 99(1):12-22
- Stuart B. 2005. Infrared spectroscopy: Wiley Online Library.
- Sturm S, Seger C. 2012. Liquid chromatography–nuclear magnetic resonance coupling as alternative to liquid chromatography–mass spectrometry hyphenations: curious option or powerful and complementary routine tool? *Journal of chromatography A* 1259:50-61.
- Sudha P, Zinjarde SS, Bhargava SY, Kumar AR. 2011. Potent α -amylase inhibitory activity of Indian Ayurvedic medicinal plants. *BMC complementary and alternative medicine* 11(1):5.
- Sultana B, Anwar F, Ashraf M. 2009. Effect of extraction solvent/technique on the antioxidant activity of selected medicinal plant extracts. *Molecules* 14(6):2167-2180.
- Takahashi M, Takahashi Y, Takahashi K, Zolotaryov FN, Hong KS, Kitazawa R, Iida K, Okimura Y, Kaji H, Kitazawa S. 2008. Chemerin enhances insulin signaling and potentiates insulin-stimulated glucose uptake in 3T3-L1 adipocytes. *FEBS letters* 582(5):573-578.

- Tan BKH, Ong KW. 2014. Influence of Dietary Polyphenols on Carbohydrate Metabolism. *Polyphenols in Human Health and Disease*: Elsevier. p 95-111.
- Tang H-J, Zhang X-W, Yang L, Li W, Li J-H, Wang J-X, Chen J. 2016. Synthesis and evaluation of xanthine oxidase inhibitory and antioxidant activities of 2-arylbenzo [b] furan derivatives based on salvianolic acid C. *European journal of medicinal chemistry* 124:637-648.
- Tarling CA, Woods K, Zhang R, Brastianos HC, Brayer GD, Andersen RJ, Withers SG. 2008. The search for novel human pancreatic α -amylase inhibitors: high-throughput screening of terrestrial and marine natural product extracts. *ChemBioChem* 9(3):433-438.
- Tiganis T. 2011. Reactive oxygen species and insulin resistance: the good, the bad and the ugly. *Trends in pharmacological sciences* 32(2):82-89.
- Toukan K, Rahman A. 1985. Molecular-dynamics study of atomic motions in water. *Physical Review B* 31(5):2643.
- Troszynska A, Ciska E. 2002. Phenolic compounds of seed coats of white and coloured varieties of pea (*Pisum sativum L.*) and their total antioxidant activity. *Czech journal of food sciences* 20(1):15-22.
- Tsao R, Deng Z. 2004. Separation procedures for naturally occurring antioxidant phytochemicals. *Journal of chromatography B* 812(1-2):85-99.
- Tsao R, Yang R. 2003. Optimization of a new mobile phase to know the complex and real polyphenolic composition: towards a total phenolic index using high-performance liquid chromatography. *Journal of chromatography A* 1018(1):29-40.

- Tung Y-T, Chang S-T. 2010. Inhibition of xanthine oxidase by *Acacia confusa* extracts and their phytochemicals. *Journal of agricultural and food chemistry* 58(2):781-786.
- Turco I, Ferretti G, Bacchetti T. 2016. Review of the health benefits of Faba bean (*Vicia faba* L.) polyphenols. *Journal of Food & Nutrition Research* 55(4).
- Turco I, Ferretti G, Bacchetti T. 2016. Review of the health benefits of Faba bean (*Vicia faba* L.) polyphenols. *Journal of Food & Nutrition Research* 55(4).
- Turco I, Ferretti G, Bacchetti T. 2016. Review of the health benefits of Faba bean (*Vicia faba* L.) polyphenols. *Journal of Food & Nutrition Research* 55(4).
- Turco I, Ferretti G, Bacchetti T. 2016. Review of the health benefits of Faba bean (*Vicia faba* L.) polyphenols. *Journal of Food & Nutrition Research* 55(4).
- Tzima K, Brunton NP, Rai DK. 2018. Qualitative and quantitative analysis of polyphenols in Lamiaceae plants—A review. *Plants* 7(2):25.
- Uitdehaag JC, Mosi R, Kalk KH, van der Veen BA, Dijkhuizen L, Withers SG, Dijkstra BW. 1999. X-ray structures along the reaction pathway of cyclodextrin glycosyltransferase elucidate catalysis in the α -amylase family. *Nature Structural and Molecular Biology* 6(5):432.
- Urso ML, Clarkson PM. 2003. Oxidative stress, exercise, and antioxidant supplementation. *Toxicology* 189(1-2):41-54.
- Valko M, Leibfritz D, Moncol J, Cronin MT, Mazur M, Telser J. 2007. Free radicals and antioxidants in normal physiological functions and human disease. *The international journal of biochemistry & cell biology* 39(1):44-84.

- Valko M, Leibfritz D, Moncol J, Cronin MT, Mazur M, Telser J. 2007. Free radicals and antioxidants in normal physiological functions and human disease. *The international journal of biochemistry & cell biology* 39(1):44-84.
- Van Der Spoel D, Lindahl E, Hess B, Groenhof G, Mark AE, Berendsen HJ. 2005. GROMACS: fast, flexible, and free. *Journal of computational chemistry* 26(16):1701-1718.
- Van Der Spoel D, Lindahl E, Hess B, Groenhof G, Mark AE, Berendsen HJ. 2005. GROMACS: fast, flexible, and free. *Journal of computational chemistry* 26(16):1701-1718.
- Van Der Spoel D, Lindahl E, Hess B, Groenhof G, Mark AE, Berendsen HJ. 2005. GROMACS: fast, flexible, and free. *Journal of computational chemistry* 26(16):1701-1718.
- Vattem D, Shetty K. 2005. Biological functionality of ellagic acid: a review. *Journal of food biochemistry* 29(3):234-266.
- Vijayabaskar P, Shiyamala V. 2012. Antioxidant properties of seaweed polyphenol from Turbinaria ornata (Turner) J. Agardh, 1848. *Asian Pacific Journal of Tropical Biomedicine* 2(1):S90-S98.
- Vilar L, Canadas V, Arruda MJ, Arahata C, Agra R, Pontes L, Montenegro L, Vilar CF, Albuquerque JL, Gusmão A. 2010. Comparison of metformin, gliclazide MR and rosiglitazone in monotherapy and in combination for type 2 diabetes. *Arquivos Brasileiros de Endocrinologia & Metabologia* 54(3):311-318.
- Vlassara H, Palace M. 2002. Diabetes and advanced glycation endproducts. *Journal of internal medicine* 251(2):87-101.

- Wallace AC, Laskowski RA, Thornton JM. 1995. LIGPLOT: a program to generate schematic diagrams of protein-ligand interactions. Protein engineering, design and selection 8(2):127-134.
- Wan Y, Zou B, Zeng H, Zhang L, Chen M, Fu G. 2016. Inhibitory effect of verbascoside on xanthine oxidase activity. International journal of biological macromolecules 93:609-614.
- Wang Y, Zhang G, Pan J, Gong D. 2015. Novel insights into the inhibitory mechanism of kaempferol on xanthine oxidase. Journal of agricultural and food chemistry 63(2):526-534.
- Xu Y, Lee J, Park Y-D, Yang J-M, Zheng J, Zhang Q. 2018. Molecular dynamics simulation integrating the inhibition kinetics of hydroxysafflor yellow A on α -glucosidase. Journal of Biomolecular Structure and Dynamics 36(4):830-840.
- Yang CS, Landau JM, Huang M-T, Newmark HL. 2001. Inhibition of carcinogenesis by dietary polyphenolic compounds. Annual review of nutrition 21(1):381-406.
- Yang M-H, Schaich KM. 1996. Factors affecting DNA damage caused by lipid hydroperoxides and aldehydes. Free Radical Biology and Medicine 20(2):225-236.
- Yang M, Sun J, Lu Z, Chen G, Guan S, Liu X, Jiang B, Ye M, Guo D-A. 2009. Phytochemical analysis of traditional Chinese medicine using liquid chromatography coupled with mass spectrometry. Journal of chromatography A 1216(11):2045-2062.
- Yao Y, Cheng X, Wang L, Wang S, Ren G. 2011. Biological potential of sixteen legumes in China. International journal of molecular sciences 12(10):7048-7058.

- Ye EQ, Chacko SA, Chou EL, Kugizaki M, Liu S. 2012. Greater Whole-Grain Intake Is Associated with Lower Risk of Type 2 Diabetes, Cardiovascular Disease, and Weight Gain-3. *The Journal of nutrition* 142(7):1304-1313.
- Yilmazer-Musa M, Griffith AM, Michels AJ, Schneider E, Frei B. 2012. Inhibition of α -amylase and α -glucosidase activity by tea and grape seed extracts and their constituent catechins. *Journal of agricultural and food chemistry* 60(36):8924.
- Yu Z, Fong WP, Cheng CH. 2006. The dual actions of morin (3, 5, 7, 2', 4'-pentahydroxyflavone) as a hypouricemic agent: uricosuric effect and xanthine oxidase inhibitory activity. *Journal of Pharmacology and Experimental Therapeutics* 316(1):169-175.(12):21138-21156.
- Zhang Y-J, Gan R-Y, Li S, Zhou Y, Li A-N, Xu D-P, Li H-B. 2015. Antioxidant phytochemicals for the prevention and treatment of chronic diseases. *Molecules* 20
- Zhou K, Slavin M, Lutterodt H, Whent M, Eskin NM, Yu L. 2013. Cereals and legumes. *Biochemistry of Foods* (Third Edition): Elsevier. p 3-48.
- Zimmet P, Alberti K, Shaw J. 2001. Global and societal implications of the diabetes epidemic. *Nature* 414(6865):782.
- Zuo Y, Chen H, Deng Y. 2002. Simultaneous determination of catechins, caffeine and gallic acids in green, Oolong, black and pu-erh teas using HPLC with a photodiode array detector. *Talanta* 57(2):307-316.

