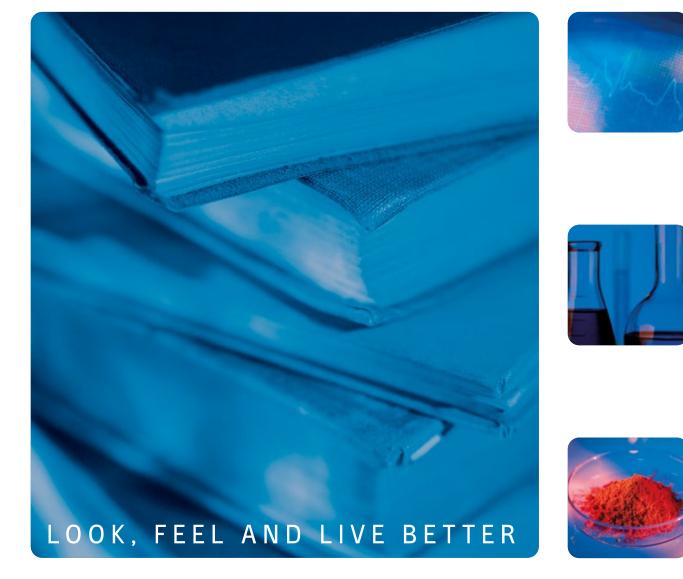
Bibliography





Index

1.	Review Articles	3
2.	Cardiovascular	7
3.	Venous Disorders	12
4.	Diabetic Syndrome	16
5.	Eye Health	20
6.	Inflammation	21
7.	Joint Health	24
8.	Allergies & Asthma	26
9.	Women's Health, Fertility & the Reproductive System	28
10.	Sport & Endurance	31
11.	Cognitive Function	32
12.	Skin Care	35
13.	Oral Health Care	39
14.	Benefits for Travellers	40
15.	Immunology, Anti-Microbial & Anti-Viral Activity	41
16.	Antioxidant- & Anti-Ageing Activity	44
17.	Analytics, Bio-Availability & Metabolism	51
18.	Bowel & Digestion	53
19.	Physiology	54



1. Review Articles

Ref. 472	Review: Pycnogenol [®] is considered to have therapeutic benefits in ADHD, as it increased antioxidant levels, reduced oxidative damage and improved neurochemical status. Verlaeat AAJ, Maasakkers CM, Hermans N, Savelkoul HFJ Rationale for Dietary Antioxidant Treatment of ADHD. Nutrients 10, 405; doi: 10.3390/nu10040405, 2018
Ref. 463	Review: Pycnogenol [®] relieves venous edema. The combined topical and oral use of Pycnogenol [®] accelerates the healing of venous and diabetic ulcers and hemorrhoids Rohdewald P Pycnogenol [®] bei Erkrankungen des venösen Systems – eine systematische Übersicht. Schweiz Z Ganzheitsmed 29: 372-375, 2017
Ref. 462	Review: Pycnogenol® improves women's health in a non-hormonal way. Rohdewald PJ Pycnogenol®, a Plant Extract for Women's Health. Int J Women's Health Care (IJWHC) 2(1): 1-5, 2017
Ref. 461	Review: Pycnogenol [®] with its anti-inflammatory and chondroprotective effects acts like a sustained-release formulation by its combination of fast absorbed phenolic compounds and slowly metabolized procyanidins. Rohdewald PJ Review on sustained relief of osteoarthritis symptoms with a proprietary extract from pine bark extract, Pycnogenol [®] . J Med Food 21(1): 1-4, 2018
Ref. 449	A review on the efficacy of Pycnogenol® to alleviate climacteric symptoms by improving endothelial function and antioxidative status. Rohdewald P Relief from Menopausal Symptoms by Non-hormonal Treatment with Pycnogenol® (French Maritime Pine Bark Extract). J Genit Syst & Disor 5:4, 2016
Ref. 448	A review suggesting Pycnogenol® as adjunct treatment to conventional therapy for hepatitis-associated diabetes. Ezzikouri S, Jadid FZ, Hamdi S, Wakrim L, Tsukiyama-Kohara K, Benjelloun S Supplementing Conventional Treatment with Pycnogenol® May Improve Hepatitis C Virus-Associated Type 2 Diabetes: A Mini Review. J Clin Translational Hepatol 4: 228-233, 2016
Ref. 444	Review comprising Pycnogenol® virtues for allergic rhinitis (hayfever). Ross SM Allergic Rhinitis. A proprietary extract of Pinus pinaster Aiton (Pycnogenol®) is found to improve the symptoms associated with allergic rhinitis. Hollist Nurs Pract 30: 301-304, 2016
Ref. 430	This article reviews earlier clinical Pycnogenol® research of the group, identifying improved skin elasticity and hydration, highlighting new findings on oral Pycnogenol® supporting fairer skin complexion, as well as improved skin barrier function. Grether-Beck S, Marini A, Jaenicke T, Krutmann J French Maritime Pine Bark Extract (Pycnogenol®) Effects on Human Skin: Clinical and Molecular Evidence. Skin Pharmacol Physiol 29: 13-17, 2016
Ref. 422	Review: Summary of clinical studies with Pycnogenol[®] published between 2010 and 2015. Rohdewald P Update on the clinical pharmacology of Pycnogenol [®] . Medical Research Archives July 2015 Issue 3: 1-11, 2015



Review Articles

Ref. 415	This review article comprises the current knowledge on Pycnogenol® for improvement of health of individuals with metabolic syndrome and diabetes. Gulati O Pycnogenol® in Metabolic Syndrome and Related Disorders. Phytother Res 29: 949-968, 2015
Ref. 346	A review on the broad applicability of Pycnogenol® for personalized health care, for prevention as well as treatment. Strong J French maritime pine bark extract (Pycnogenol®) and the use of health supplements in the age of personalized medicine. Panminerva Med 53: 1-2, 2011
Ref. 326	A comprehensive review of the composition and pharmacology of Pycnogenol [®] as well as the published medical research. Maimoona A, Naeem I, Saddiqe Z, Jameel K A review on biological, nutraceutical and clinical aspects of French maritime pine bark extract. J Ethnopharmacol 133: 261-277, 2011
Ref. 269	A clinical overview based on the full monograph covering published scientific and clinical research on Pycnogenol [®] . Oliff H Scientific and clinical monograph on Pycnogenol [®] . The American Botanical Council 2009
Ref. 266	A comprehensive review of research on Pycnogenol [®] in the field of venous insufficiency. Gulati OP Pycnogenol [®] : a nutraceutical for venous health. Biomedical Reviews 19: 33-43, 2008
Ref. 261	This review article covers the wide range of contributions of Pycnogenol [®] for diabetic people, such as lowering of blood glucose and helping with a majority of diabetic complications. Rohdewald P Regulation of diabetes by Pycnogenol [®] . Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 62: 587-594, 2008
Ref. 259	A comprehensive review of Pycnogenol [®] 's anti-inflammatory activity and its role for controlling diverse inflammatory disorders. Farid R Pycnogenol [®] in the treatment of inflammatory diseases: osteoarthritis, asthma and heart disease. Botanical medicine in clinical practice. (ed.) Watson RR, Preedy VR; Wallingford, England, CABI Publishing, chapter 68: 633-640, 2008
Ref. 258	A review of the extensive number of studies related to treatment of edema with Pycnogenol [®] including findings on leg swellings occuring during long haul travelling. Belcaro G, Cesarone MR, Cornelli U, Rohdewald P, Ledda A, Di Renzo A, Stuard, S, Cacchio M, Vinciguerra G, Gizzi G, Pellegrini L, Dugall M, Ricci A, Ruffini I, Fano F Treatment of chronic venous insufficiency and prevention of economy class syndrome. Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 64: 603-609, 2008



Review Articles

Ref. 257	Review of Pycnogenol®'s manifold benefits for cardiovascular health. Watson RR, Argüelles MC Pycnogenol® and cardiovascular health. Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 56: 538-544, 2008
Ref. 228	Introduction to the pathology of myocarditis and a discussion on mechanisms by which Pycnogenol® may help the heart to recover. Matsumori A Treatment Options in Myocarditis. Herz 32: 452-456, 2007
Ref. 210	Clinical Pharmacology of Pycnogenol [®] - A review. Rohdewald P Clinical Pharmacology of Pycnogenol [®] . Pharma Bio World 5: 79-81, 2006
Ref. 180	Pycnogenol [®] 's beneficial effects in blood micro-circulation, dysmenorrheal, stiff shoulder, and pregnancy associated pain. Kohama T Nutritional supplements in clinical practice. Progr Med 24: 1503-1510, 2004
Ref. 169	Monograph on Safety and efficacy aspects of Pycnogenol [®] . Blumenthal M Pycnogenol [®] (French Maritime Pine Bark Extract) <i>Pinus Pinaster</i> Aiton subsp. <i>atlantica</i> . The American Botanical Council guide to Herbs, 369-373, 2003
Ref. 168	Pycnogenol® as a nutraceutical in cardiovascular health and diabetes. Gulati OP The Nutraceutical Pycnogenol [®] : Its role in cardiovascular health and blood glucose control. Biomed Rev 16: 49-57, 2005
Ref. 160	Monograph on Pycnogenol® covering pharmacological activities and clinical benefits. Rohdewald P Pycnogenol®, French Maritime Pine Bark Extract. Encyclopedia of Dietary Supplements; Ed. Marcel Dekker, digital publisher, 545-553, 2005
Ref. 114	Review of the cardiovascular health benefits of Pycnogenol®. Watson RR Pycnogenol® and cardiovascular health. Evid Based Integr Med 1: 27-32, 2003
Ref. 094	Summary of beneficial effects of Pycnogenol® for skin care. Schönlau F The cosmeceutical Pycnogenol®. J Appl Cosmetol 20: 241-246, 2002





Review Articles

Ref. 092	Summary of five clinical studies describing the effects of Pycnogenol® in patients with diabetic retinopathy. Schönlau F, Rohdewald P Pycnogenol® for diabetic retinopathy: A review. Int Ophthalmol 24: 161-171, 2002
Ref. 085	Review article on the pharmacological activities of Pycnogenol®. Rohdewald P A review of the French maritime pine bark extract (Pycnogenol®), a herbal medication with a diverse clinical pharmacology. Int J Clin Pharmacol Ther 40: 158-168, 2002
Ref. 041	A review of the efficacy and safety of Pycnogenol [®] for treatment of venous disorders. Gulati OP Pycnogenol [®] in venous disorders: A review. Eur Bull Drug Res 7: 8-13, 1999
Ref. 039	The cardiovascular pharmacological profile of Pycnogenol [®] , with focus on platelet aggregation prevention is reviewed. Watson R Reduction of cardiovascular disease risk factors by French Maritime Pine Bark Extract. Cardiovasc Rev Rep XX: 326-329, 1999
Ref. 038	This article reviews the antioxidant activity of Pycnogenol [®] and its effects on the immune system and modulation of inducible nitric oxide synthase. Virgili F, Kobuchi H, Noda Y, Cossins E, Packer L Procyanidins from Pinus maritima bark: Antioxidant activity, effects on the immune system and Modulation of Nitrogen Monoxide Metabolism. In "Antioxidant Food Supplements in human health", ed. L. Packer, M. Hiramatsu and T. Yoshikawa, published by Academic Press, Chapter 21, pages 323-342, 1999
Ref. 034	An introduction to the chemistry, antioxidant activity and biologic properties of Pycnogenol [®] . Packer L, Rimbach G, Virgili F Antioxidant activity and biologic properties of a procyanidin-rich extract from pine (<i>Pinus maritima</i>) bark, Pycnogenol [®] . J Free Radic Biol Med 27: 704-724, 1999
Ref. 031	The history of ancient pine bark uses to the present day development of Pycnogenol [®] . Drehsen G From ancient pine bark uses to Pycnogenol [®] In "Antioxidant Food Supplements in human health", ed. L. Packer, M. Hiramatsu and T. Yoshikawa, published by Academic Press, Chapter 20, pages 311-322, 1999



2. Cardiovascular

Ref. 453	CLINICAL STUDY: Further to alleviating menopausal symptoms, Pycnogenol® significantly improves blood sugar and -lipids, and supports healthy blood pressure, CRP- and homocysteine values. Luzzi R, Belcaro G, Hosoi M, Feragalli B, Cornelli U, Dugall M, Ledda A Normalization of cardiovascular risk factors in peri-menopausal women with Pycnogenol [®] . Minerva Ginecol 69: 29-34, 2017
Ref. 445	CLINICAL STUDY: Pycnogenol [®] increases muscular strength and heart ejection fraction in senior citizen with muscle weakness. Belcaro G, Dugall M Preservation of muscular mass and strength in aged subjects with Pycnogenol [®] supplementation. Minerva Ortopedica Traumatologica 67(3): 124-130, 2016
Ref. 442	Preclinical study describing mechanisms of Pycnogenol® related to atherosclerosis improvement. Liu R, Fan B, Cong H, Ikuyama S, Guan H, Gu J Pycnogenol® reduces toll-like receptor 4 signaling pathway-mediated atherosclerosis formation in apolipoprotein E-deficient mice. J Cardiovasc Pharmacol 68: 292-303, 2016
Ref. 438	CLINICAL STUDY: Pycnogenol [®] in association with Centellicum [®] stabilises carotid artery plaques. Luzzi R, Belcaro G, Ippolito E Carotid plaque stabilization induced by the supplement association Pycnogenol [®] and centella asiatica (Centellicum [®]). Minerva Cardioangiol 64: 603-609, 2016
Ref. 434	Review: A summary of investigations related to biological activities and clinical actions of Pycnogenol [®] related to oedema, ulcers, thromboses, CVI and haemorrhoids. Rohdewald P Gerbstoffhaltiger Extrakt zur oralen und topischen Behandlung bei CVI und Hämorrhoidalleiden. Phlebologie 44: 334-338, 2015
Ref. 426	Pycnogenol [®] is shown in pre-clinical study to reduce atherosclerotic plaque and lipid deposition, decreasing the lipid-related protein expression of adipose differentiation-related protein and adipocyte lipid-binding protein in dose dependent fashion. Luo H, Wang J, Qiao C, Ma N, Liu D, Zhang W Pycnogenol attenuates atherosclerosis by regulating lipid metabolism through the TLR4-NF-kappaB pathway. Experimental & Molecular Medicine 47, e191; doi:10.1038/emm.2015.74, 2015
Ref. 415	This review article comprises the current knowledge on Pycnogenol [®] for improvement of health of individuals with metabolic syndrome and diabetes. Gulati O Pycnogenol [®] in Metabolic Syndrome and Related Disorders. Phytother Res 29: 949-968, 2015
Ref. 408	CLINICAL STUDY: Endothelial function is improved by Pycnogenol [®] . Results of this open registry study indicate an important preventive possibility for borderline hypertensive, hyperglycemic and hyperlipidemic subjects. Hu S, Belcaro G, Cornelli U, Luzzi R, Cesarone MR, Dugall M, Feragalli B, Errichi B, Ippolito E, Grossi MG, Hosoi M, Gizzi G, Trignani M Effects of Pycnogenol [®] on endothelial dysfunction in borderline hypertensive, hyperlipidemic, and hyperglycemic individuals: the borderline study. Int Angiol 34(1): 43-52, 2015
Ref. 393	CLINICAL STUDY: Patients with Meniere's disease and tinnitus benefit from Pycnogenol [®] supplementation. Luzzi R, Belcaro G, Hu S, Dugall M, Hosoi M, Cacchio M, Ippolito E, Corsi M Improvement in symptoms and cochlear flow with Pycnogenol [®] in patients with Meniere's disease and tinnitus. Minerva Med 105: 245-254, 2014





Cardiovascular

Ref. 385	Pycnogenol[®] shows beneficial effects in metabolic and cardiovascular health. Aribal-Ayral P, Özelci-Kavas G, Elhan AH Pycnogenol [®] supplementation and its beneficial effects in healthy rats. Saudi Med J 35(2): 195-197, 2014
Ref. 382	CLINICAL STUDY: Progression of subclinical arterial lesions and reduction in plaque progression after supplementation of Pycnogenol [®] and Centella Asiatica could be observed in this pilot substudy. Belcaro G, Dugall M, Hosoi M, Ippolito E, Cesarone MR, Luzzi R, Cornelli U, Ledda A Pycnogenol [®] and Centella Asiatica for asymptomatic atherosclerosis progression. Int Angiol 1(33): 20-26, 2014
Ref. 360	CLINICAL STUDY: Pycnogenol [®] improves all signs and symptoms of metabolic syndrome to healthy values within three months. Belcaro G, Cornelli U, Luzzi R, Cesarone MR, Dugall M, Feragalli B, Errichi S, Ippolito E, Grossi MG, Hosoi M, Cornelli M, Gizzi G Pycnogenol [®] supplementation improves health risk factors in subjects with metabolic syndrome. Phytother Res 27: 1572-1578, 2013
Ref. 349	CLINICAL STUDY: Pycnogenol® taken in addition to heart medications significantly enhances endothelial function in individuals who previously suffered a heart attack. Enseleit F, Sudano I, Périat D, Winnik S, Wolfrum M, Flammer AJ, Fröhlich GM, Kaiser P, Hirt A, Haile SR, Krasniqi N, Matter CM, Uhlenhut K, Högger P, Neidhart M, Lüscher TF, Ruschitzka F, Noll G Effects of Pycnogenol® on endothelial function in patients with stable coronary artery disease: a double-blind, randomized, placebo-controlled, cross-over study. Eur Heart J 33(13): 1589-97, 2012
Ref. 295	CLINICAL STUDY: Pycnogenol® reduces the disturbing "ringing" or "hissing" noise sensation in tinnitus patients which is suggested to result from an improved blood flow to the cochlea of the ears. Grossi MG, Belcaro G, Cesarone MR, Duggall M, Hosoi M, Cacchio M, Ippolito E, Bavera P Improvement in cochlear flow with Pycnogenol® in patients with tinnitus: a pilot evaluation. Panminerva Med 52 (suppl. 1 to No. 2): 63-67, 2010
Ref. 294	CLINICAL STUDY: Pycnogenol [®] in synergy with CoQ10 strengthens the heart for higher ejection fraction, lower heart rate and a significant increase of physical capacity. Belcaro G, Cesarone MR, Dugall M, Hosoi M, Ippolito E, Bavera P, Grossi MG Investigation of Pycnogenol [®] in combination with coenzymeQ10 in heart failure patients (NYHA II/III). Panminerva Med 52 (suppl. 1 to No. 2): 21-25, 2010
Ref. 293	CLINICAL STUDY: Pycnogenol® restores compromised kidney function of metabolic syndrome patients as judged by decreased urinary protein and improved blood flow to kidneys. Stuard S, Belcaro G, Cesarone MR, Ricci A, Cornelli U, Gizzi G Kidney function in metabolic syndrome may be improved with Pycnogenol®. Panminerva Med 52 (suppl. 1 to No. 2): 27-32, 2010
Ref. 291	Pycnogenol® protects cardiac muscle from damage resulting from diabetes in an animal model. Klimas J, Kmecova J, Jankyova S, Yaghi D, Priesolova E, Kyselova Z, Musil P, Ochodnicky P, Krenek P, Kyselovic J, Matyas S Pycnogenol® improves left ventricular function in streptozotocin-induced diabetic cardiomyopathy in rats. Phytother Res 24: 969-974, 2010



Cardiovascular

Ref. 283	CLINICAL STUDY: Pycnogenol [®] taken as an adjunct to hypertensive medication improves kidney flow and function and further improves blood pressure. Cesarone MR, Belcaro G, Stuard S, Schönlau F, Di Renzo A, Grossi MG, Dugall M, Cornelli U, Cacchio M, Gizzi G, Pellegrini L Kidney Flow and Function in Hypertension: Protective Effects of Pycnogenol [®] in Hypertensive Participants – A Controlled Study. J Cardiovasc Pharmacol Ther 15: 41-46, 2010
Ref. 281	Pycnogenol® protects the kidneys from damage caused by oxidative stress and ischemia in an animal model. Ozer Sehirli A, Sener G, Ercan F Protective effects of Pycnogenol® against ischemia reperfusion-induced oxidative renal injury in rats. Ren Fail 31: 690-697, 2009
Ref. 257	Review of Pycnogenol[®]'s manifold benefits for cardiovascular health. Watson RR, Argüelles MC Pycnogenol [®] and cardiovascular health. Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 56: 538-544, 2008
Ref. 237	CLINICAL STUDY: Pycnogenol® given in addition to diabetic and hypertensive medication significantly further improves blood sugar and cardio-vascular risk factors and allows a majority of patients to lower anti- hypertensive medication. Zibadi S, Rohdewald P, Park D, Watson RR Reduction of cardiovascular risk factors in subjects with Type 2 Diabetes by Pycnogenol® supplementation. Nutr Res 28: 315-320, 2008
Ref. 233	Pycnogenol [®] lowers platelet hyperactivity more effectively than aspirin in a type I diabetes pharmacologic model suggesting a protective effect from thrombosis in diabetes. Nocun M, Ulicna O, Muchova J, Durackova Z, Watala C French maritime pine bark extract (Pycnogenol [®]) reduces thromboxane generation in blood from diabetic male rats. Biomed Pharmacother 62: 168-172, 2007
Ref. 230	CLINICAL STUDY: Pycnogenol® increases endothelium-dependent vasodilation by 42%, by enhancing the synthesis of nitric oxide in young healthy men. Nishioka K, Hidaka T, Nakamura S, Umemura T, Jitsuiki D, Soga J, Goto C, Chayama K, Yoshizumi M, Higashi Y Pycnogenol®, French Maritime Pine Bark Extract, augments endothelium-dependent vasodilation in humans. Hypertens Res 30: 775-780, 2007
Ref. 229	Pycnogenol® counteracts viral infection and prevents development of virus-induced heart muscle inflammation. Matsumori A, Higuchi H, Shimada M French maritime pine bark extract inhibits viral replication and prevents development of viral myocarditis. J Card Fail 13: 785-791, 2007
Ref. 216	Pycnogenol[®] prevents heart failure damage in mice. Zibadi S, Yu Q, Rohdewald PJ, Larson DF, Watson RR Impact of Pycnogenol [®] on cardiac extracellular matrix remodeling induced by L-NAME administration to old mice. Cardiovasc Toxicol 7: 10-18, 2007
Ref. 207	Pycnogenol[®] shows strengthening of heart muscle cells <i>in vitro</i>. Hasegawa N, Kinoshita H, Mochizuki M Pycnogenol [®] increases the probability of the contraction state in chick embryonic cardiomyocytes, indicating inotropic effects. Phytother Res 21: 181-182, 2007



Cardiovascular

Ref. 200	CLINICAL STUDY: Pycnogenol® reduces oedema as side effect from hypotensive medication in hypertensive subjects. Belcaro G, Cesarone MR, Ricci A, Cornelli U, Rohdewald P, Ledda A, Di Renzo A, Stuard S, Cacchio M, Vinciguerra G, Gizzi G, Pellegrini L, Dugall M, Fano F Control of edema in hypertensive subjects treated with calcium antagonist (Nifedipine) or angiotensin-converting enzyme inhibitors with Pycnogenol [®] . Clin Appl Thromb Hemost 12: 440-444, 2006
Ref. 187	CLINICAL STUDY: Pycnogenol [®] significantly lowered LDL and increased HDL in 155 menopausal women during a treatment period of 6 months. Yang HM, Liao MF, Zhu SY, Liao MN, Rohdewald P A randomized, double-blind, placebo-controlled trial on the effect of Pycnogenol [®] on the climacteric syndrome in peri- menopausal women. Acta Obstet Gynecol Scand 86: 978-985, 2007
Ref. 177	Pycnogenol[®] and Coenzyme Q10 enhance cardiovascular health synergistically. Watson RR Nutraceutical Synergism: Pycnogenol [®] and Coenzyme Q10 Enhance Cardiovascular Health. Evid Based Integrative Med 2: 67-70, 2005
Ref. 168	Pycnogenol® as a nutraceutical in cardiovascular health and diabetes (Review). Gulati OP The Nutraceutical Pycnogenol®: its role in cardiovascular health and blood glucose control. Biomed Rev 16: 49-57, 2005
Ref. 140	Pycnogenol [®] increases red blood cell membrane fluidity and protects erythrocytes against oxidative stress. Sivonova M, Waczulikova I, Kilanczyk E, Hrnciarova M, Bryszewska M, Klajnert B, Durackova Z The effect of Pycnogenol [®] on the erythrocyte membrane fluidity. Gen Physiol Biophys 23: 39-51, 2004
Ref. 117	CLINICAL STUDY: Pycnogenol [®] as an adjunct to hypotensive medication with Nifedipine improves endothelial function and allows for lowering the drug dosage. Liu X, Wei J, Tan F, Zhou S, Würthwein G, Rohdewald P Pycnogenol [®] French maritime pine bark extract, improves endothelial function of hypertensive patients. Life Sci 74: 855-862, 2004
Ref. 114	A review of published beneficial effects of Pycnogenol [®] for cardiovascular health. Watson RR Pycnogenol [®] and cardiovascular health. Evid Based Integrative Med 1: 27-32, 2003
Ref. 093	CLINICAL STUDY: Pycnogenol [®] supplementation lowered total cholesterol and LDL and increased HDL, resulting in a better atherosclerotic index. Durackova Z, Trebaticka B, Novotny V, Zitnanova I, Breza J Lipid metabolism and erectile function improvement by Pycnogenol [®] , extract from the bark of <i>Pinus pinaster</i> in patients suffering from erectile Dysfunction - a pilot study Nutr Res 23: 1189-1198, 2003
Ref. 090	CLINICAL STUDY: Pycnogenol [®] supplementation improves blood antioxidant capacity, lowers LDL and increases HDL cholesterol in human volunteers. Devaraj S, Vega-López S, Kaul N, Schönlau F, Rohdewald P, Jialal I Supplementation with a pine bark extract rich in polyphenols increases plasma antioxidant capacity and alters plasma lipoprotein profile. Lipids 37: 931-934, 2002



Cardiovascular

Ref. 079	CLINICAL STUDY: Pycnogenol [®] lowered LDL significantly in patients with chronic venous insufficiency while horse chestnut seed extract had no effect. Koch R Comparative study of Venostasin [®] and Pycnogenol [®] in chronic venous insufficiency. Phytother Res 16: 1-5, 2002
Ref. 080	CLINICAL STUDY: Pycnogenol® reduces blood pressure in hypertensive patients not taking medication. Hosseini S, Lee J, Sepulveda RT, Rohdewald P, Watson RR A randomized, double-blind, placebo-controlled, prospective, 16 week crossover study to determine the role of Pycnogenol® in modifying blood pressure in mildly hypertensive patients. Nutr Res 21: 1251-1260, 2001
Ref. 053	CLINICAL STUDY: Pycnogenol [®] inhibits smoking-induced increase of thromboxane B2 levels, which explains the decreased platelet aggregation observed with Pycnogenol [®] in smokers. Araghi-Niknam M, Hosseini S, Larson D, Rohdewald P, Watson RR Pine bark extract reduces platelet aggregation. Int Med 2: 73-77, 1999
Ref. 043	CLINICAL STUDY: Pycnogenol [®] inhibits platelet aggregation and adhesion and improves blood micro- circulation in heart disease patients. Wang S, Tan D, Zhao Y, Gao G, Gao X, Hu L The effect of Pycnogenol [®] on the microcirculation, platelet function and ischemic myocardium in patients with coronary artery diseases. Eur Bull Drug Res 7: 19-25, 1999
Ref. 042	Pycnogenol [®] helps to maintain a healthy circulation through vasodilatation, anti platelet aggregation, free radical scavenging and capillary sealing effects. The role of endothelial nitric oxide (NO) is also discussed. Rohdewald P Reducing the risk for stroke and heart infarction with Pycnogenol [®] . Eur Bull Drug Res 7: 14-18, 1999
Ref. 036	CLINICAL STUDY: Pycnogenol [®] inhibits smoking induced platelet aggregation in dose-dependent manner in humans. The effect lasts for more than 6 days and unlike aspirin does not increase bleeding. Pütter M, Grotemeyer KHM, Würthwein G, Araghi-Niknam M, Watson RR, Hosseini S, Rohdewald P Inhibition of smoking-induced platelet aggregation by aspirin and Pycnogenol [®] . Thromb Res 95: 155-161, 1999
Ref. 027	Pycnogenol® counteracts the constriction of blood vessels. The vaso-relaxant activity of Pycnogenol® is mediated through nitric oxide. Fitzpatrick DF, Bing B, Rohdewald P Endothelium-dependent vascular effects of Pycnogenol [®] . J Cardiovasc Pharmacol 32: 509-515, 1998
Ref. 017	Pycnogenol [®] inhibits the angiotensin II converting enzyme (ACE) and produces a moderate hypotensive effect in rats. Blazso G, Gaspar R, Gabor M, Rüve H-J, Rohdewald P ACE inhibition and hypotensive effect of procyanidinis containing extract from the bark of <i>Pinus pinaster</i> Sol. Pharm Pharmacol Lett 6: 8-11, 1996



3. Venous Disorders

Ref. 476	Pycnogenol® is more effective in preventing of the post-thrombotic syndrome and a new venous thrombosis than Aspirin, sulodexide and ticlopidine. Belcaro G, Dugall M, Hu S, Feragalli B, Cotellese R, Ledda A, Corsi M, Ricci A, Ippolito E, Errichi BM, Cornelli U, Cesarone MR, Hosoi M Prevention of recurrent venous thrombosis and post-thrombotic syndrome. Minerva Cardioangiol 66(3): 238-245, 2018
Ref. 469	CLINICAL STUDY: Pycnogenol [®] reduces edema and may control some thrombotic events. Belcaro G, Cornelli U, Dugall M, Hosoi M, Cotellese R, Feragalli B Long-haul flights, edema, and thrombotic events: prevention with stockings and Pycnogenol [®] supplementation (LONFLIT Registry Study). Minerva Cardioangiol 66: 152-159, 2018
Ref. 463	Review: Pycnogenol® relieves venous edema. The combined topical and oral use of Pycnogenol® accelerates the healing of venous and diabetic ulcers and hemorrhoids. Rohdewald P Pycnogenol® bei Erkrankungen des venösen Systems – eine systematische Übersicht. Schweiz Z Ganzheitsmed 29: 372-375, 2017
Ref. 459	CLINICAL STUDY: In comparison with stockings and several venoactive and anti-edema products Pycnogenol [®] appears to be the most potent and effective product. Belcaro G, Dugall M, Luzzi R, Corsi M, Ledda A, Ricci A, Pellegrini L, Cesarone MR, Hosoi M, Errichi BM, Cornelli U, Cotellese R, Agus G, Feragalli B Management of varicose veins and chronic venous insufficiency in a comparative registry with nine venoactive products in comparison with stockings. Int J Angiol 26: 170-178, 2017
Ref. 434	Review: A summary of investigations related to biological activities and clinical actions of Pycnogenol [®] related to oedema, ulcers, thromboses, CVI and haemorrhoids. Rohdewald P Gerbstoffhaltiger Extrakt zur oralen und topischen Behandlung bei CVI und Hämorrhoidalleiden. Phlebologie 44: 334-338, 2015
Ref. 420	CLINICAL STUDY: Pycnogenol [®] is suggested to be superior compared to other veno-tonic products. Belcaro G A clinical comparison of Pycnogenol [®] , Antistax, and Stocking in Chronic Venous Insufficiency. Int J Angiol 24: 268-274, 2015
Ref. 392	CLINICAL STUDY: The use of Pycnogenol® improves signs and symptoms of postpartum varicose veins and venous function. Veins regain shape faster. Belcaro G, Dugall M, Luzzi R, Ippolito E, Cesarone MR Postpartum Varicose Veins: Supplementation with Pycnogenol® or Elastic Compression - A 12-Month Follow-Up. Int J Angiol DOI 10.1055/s-0033-1363784, 2014
Ref. 386	CLINICAL STUDY: Pycnogenol [®] seems to decrease passive dilatation and stretching and gives vein walls a greater tonic recovery and elasticity that allows the vein to recover its original shape after dynamic stresses. Belcaro G, Dugall M, Luzzi R, Hosoi M, Corsi M Improvement of Venous Tone with Pycnogenol [®] in Chronic Venous Insufficiency: An Ex Vivo Study on Venous Segments. Int J Angiol 23:47-52, 2014
Ref. 383	CLINICAL STUDY: In the months after pregnancy, Pycnogenol® appears to positively affect hemorrhoid signs and symptoms. Belcaro G, Gizzi G, Pellegrini M, Dugall M, Luzzi R, Corsi M, Ippolito E, Ricci A, Cesarone MR, Ledda A, Bottari A, Errichi BM Pycnogenol® in postpartum symptomatic hemorrhoids. Minerva Ginecologica 66(1): 77-84, 2014



Ref. 370	A concise, yet comprehensive, up to date review on preclinical and clinical research on Pycnogenol [®] related to venous insufficiency and thrombosis management. Gulati OP Pycnogenol [®] in Chronic Venous Insufficiency and Related Venous Disorders. Phytother Res – ahead of print, 2013
Ref. 337	CLINICAL STUDY: Pycnogenol [®] protects people who suffered deep vein thrombosis from subsequently developing edema and recurring thrombosis over a 12 month investigation period. Errichi BM, Belcaro G, Hosoi M, Cesarone MR, Dugall M, Feragalli B, Bavera P, Hosoi M, Zulli C, Corsi M, Ledda A, Luzzi R, Ricci A Prevention of post thrombotic syndrome with Pycnogenol [®] in a twelve month study. Panminerva Med 53: 21-27, 2011
Ref. 292	CLINICAL STUDY: Pycnogenol [®] is as effective as compression stockings for relieving signs and symptoms of chronic venous insufficiency. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, Vinciguerra G, Ricci A, Ippolito E, Fano F, Dugall M, Cacchio M, Di Renzo A, Hosoi M, Stuard S, Corsi M Improvement of signs and symptoms of chronic venous insufficiency and microangiopathy with Pycnogenol [®] : A prospective, controlled study. Phytomedicine 17: 835-839, 2010
Ref. 280	CLINICAL STUDY: Pycnogenol® treatment lowers pain and bleeding in acute haemorroids and improves recovery. Belcaro G, Cesarone MR, Errichi B, Di Renzo A, Grossi MG, Ricci A, Dugall M, Cornelli U, Cacchio M, Rohdewald P Pycnogenol® Treatment of Acute Hemorrhoidal Episodes. Phytother Res 24: 438-444, 2010
Ref. 258	A review of the extensive number of studies related to treatment of edema with Pycnogenol [®] including findings on leg swellings occuring during long haul travelling. Belcaro G, Cesarone MR, Cornelli U, Rohdewald P, Ledda A, Di Renzo A, Stuard S, Cacchio M, Vinciguerra G, Gizzi G, Pellegrini L, Dugall M, Ricci A, Ruffini I, Fano F Treatment of chronic venous insufficiency and prevention of economy class syndrome. Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 64: 603-609, 2008
Ref. 206	CLINICAL STUDY: Pycnogenol® provides relief in venous microangiopathy. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, Vinciguerra G, Ricci A, Gizzi G, Ippolito E, Fano F, Dugall M, Acerbi G, Cacchio M, Di Renzo A, Hosoi M, Stuard S, Corsi M Rapid Relief of Signs/Symptoms in Chronic Venous Microangiopathy With Pycnogenol®: A Prospective, Controlled Study. Angiology 57: 569-576, 2006
Ref. 200	CLINICAL STUDY: Pycnogenol [®] reduces oedema, a common side effect of chronic treatment with anti- hypertensive medication. Belcaro G, Cesarone MR, Ricci A, Cornelli U, Rohdewald P, Ledda A, Di Renzo A, Stuard S, Cacchio M, Vinciguerra G, Gizzi G, Pellegrini L, Dugall M, Fano F Control of Edema in Hypertensive Subjects Treated With Calcium Antagonist (Nifedipine) or Angiotensin-Converting Enzyme Inhibitors with Pycnogenol [®] . Clin Appl Thromb Hemost 12: 440-444, 2006
Ref. 195	CLINICAL STUDY: Pycnogenol [®] accelerates healing of diabetic ulcers. Belcaro G, Cesarone MR, Errichi BM, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Gizzi G, Rohdewald P, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M Diabetic Ulcers: Microcirculatory Improvement and Faster Healing with Pycnogenol [®] . Clin Appl Thromb Hemost 12: 318-323, 2006





Venous Disorders

Ref. 182	CLINICAL STUDY: Pycnogenol [®] demonstrates superior activity versus Daflon [®] in treatment of chronic venous insufficiency in a comparative clinical study. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, Vinciguerra G, Ricci A, Gizzi G, Ippolito E, Fano F, Dugall M, Acerbi G, Cacchio M, Di Renzo A, Hosoi M, Stuard S, Corsi M Comparison of Pycnogenol [®] and Daflon [®] in Treating Chronic Venous Insufficiency: A Prospective, Controlled Study. Clin Appl Thromb Hemost 12: 205-212, 2006
Ref. 172	CLINICAL STUDY: Ulcers of the lower legs heal faster after oral plus topical application of Pycnogenol [®] . Belcaro G, Cesarone MR, Errichi BM, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Rohdewald P, Ippolito E, Ricci A, Cacchio M, Ruffini I, Fano F, Hosoi M Venous Ulcers: Microcirculatory Improvement and Faster Healing with Local Use of Pycnogenol [®] . Angiology 56: 699-705, 2005
Ref. 151	CLINICAL STUDY: Pycnogenol [®] effectively counteracts ankle swellings occurring during long-haul travelling in a double-blind, placebo-controlled study. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ippolito E, Scoccianti M, Ricci A, Dugall M, Cacchio M, Ruffini I, Fano F, Acerbi G, Vinciguerra MG, Bavera P, Di Renzo A, Errichi BM, Mucci F Prevention of edema in long flights with Pycnogenol [®] . Clin Appl Thromb Hemost 11: 289-294, 2005
Ref. 134	CLINICAL STUDY: Pycnogenol® prevents thrombosis and thrombophlebitis on long-haul flights. Belcaro G, Cesarone MR, Rohdewald P, Ricci A, Ippolito E, Dugall M, Griffin M, Ruffini I, Acerbi G, Vinciguerra MG, Bavera P, Di Renzo A, Errichi BM, Cerritelli F Prevention of venous thrombosis and thrombophlebitis in long-haul flights with Pycnogenol®. Clin Appl Thromb Hemost 10: 373-377, 2004
Ref. 116	CLINICAL STUDY: Pycnogenol® in combination with nattokinase prevents deep vein thrombosis during long- haul flights. Cesarone MR, Belcaro G, Nicolaides AN, Ricci A, Geroulakos G, Ippolito E, Brandolini R, Vinciguerra G, Dugall M, Griffin M, Ruffini I, Acerbi G, Corsi M, Riordan N, Stuard S, Bavera P, Di Renzo A, Kenyon J, Errichi BM Prevention of venous thrombosis in long-haul flights with Flite Tabs: The Lonflit- Flite randomized controlled trial. Angiology 54: 531-539, 2003
Ref. 112	CLINICAL STUDY: Addition of Pycnogenol [®] to troxerutin significantly enhances the efficacy of chronic venous insufficiency treatment and prolongs symptom relief. Riccioni C, Sarcinella R, Izzo A, Palermo G, Liguori L Efficacia della troxerutina associata al Pycnogenol [®] nel trattamento farmacologico dell'insufficienza venosa. Minerva Cardioangiol 52: 43-48, 2004
Ref. 079	CLINICAL STUDY: Pycnogenol [®] demonstrated higher efficacy for treatment of venous insufficiency than horse chestnut seed extract in a clinical trial. Koch R Comparative study of Venostasin [®] and Pycnogenol [®] in chronic venous insufficiency. Phytother Res 16: 1-5, 2002
Ref. 067	CLINICAL STUDY: Pycnogenol [®] provides significant symptoms relief from chronic venous insufficiency symptoms. Petrassi C, Mastromarino A, Spartera C Pycnogenol [®] in chronic venous insufficiency. Phytomed 7: 383-388, 2000



Venous Disorders

Ref. 066	CLINICAL STUDY: Pycnogenol® significantly improves chronic venous insufficiency and relieves disappearance of symptoms of chronic venous insufficiency. Arcangeli P Pycnogenol® in chronic venous insufficiency. Fitoterapia 71: 236-244, 2000
Ref. 041	Review article: Describes efficacy and safety profile of Pycnogenol® in treating venous disorders in humans. Mechanisms of reducing oedema are also discussed. Gulati OP Pycnogenol® in venous disorders: A review. Eur Bull Drug Res 7: 8-13, 1999
Ref. 009	Pycnogenol [®] increases the pathologically low capillary wall resistance. Pycnogenol [®] is shown to be the most potent among other bioflavonoids tested for strengthening capillary walls to decrease capillary filtration. Gabor M, Engi E, Sonkodi S Die Kapillarwandresistenz und ihre Beeinflussung durch wasserlösliche Flavonderivate bei spontan hypertonischen Ratten. Phlebologie 22: 178-182, 1993



4. Diabetic Syndrome

Ref. 448	A review suggesting Pycnogenol® as adjunct treatment to conventional therapy for hepatitis-associated diabetes. Ezzikouri S, Jadid FZ, Hamdi S, Wakrim L, Tsukiyama-Kohara K, Benjelloun S Supplementing Conventional Treatment with Pycnogenol® May Improve Hepatitis C Virus-Associated Type 2 Diabetes: A Mini Review. J Clin Translational Hepatol 4: 228-233, 2016
Ref. 435	Supplementation with Pycnogenol® as add-on to metformin medication sugests similar effects in diabetic animal model. Jankyova S, Rubintova D, Janosikova L, Panek P, Foltanova T, Kralova E The Effects of Pycnogenol® as Add-on Drug to Metformin Therapy in Diabetic Rats. Phytother Res 30: 1354-1361, 2016
Ref. 415	This review article comprises the current knowledge on Pycnogenol® for improvement of health of individuals with metabolic syndrome and diabetes. Gulati O Pycnogenol® in Metabolic Syndrome and Related Disorders. Phytother Res 29: 949-968, 2015
Ref. 401	CLINICAL STUDY: Intake of Pycnogenol [®] decreases glucose levels and increases the antioxidative capacity of plasma. Muchova J, Orszaghova Z, Zitnanova I, Trebaticky B, Breza J, Durackova Z The effect of natural polyphenols on the oxidative stress markers in patients with diabetic nephropathy. Free Rad Biol Med 72: 42, 2014
Ref. 397	Pycnogenol [®] improves the function of the heart in rats with experimental diabetes mellitus. Kralova E, Jankyova S, Mucaji P, Gresakova E, Stankovicova T Pycnogenol and its fractions influence the function of isolated heart in rats with experimental diabetes mellitus. J Pathology Research & Practice, 211: 156-161, 2015
Ref. 385	Pycnogenol[®] shows beneficial effects in metabolic and cardiovascular health. Aribal-Ayral P, Özelci-Kavas G, Elhan AH Pycnogenol [®] supplementation and its beneficial effects in healthy rats. Saudi Med J 35(2): 195-197, 2014
Ref. 384	Pycnogenol® may be cost effective in reducing the risk for diabetes-related complications. Bentley G, Schönlau F, Zibadi S, Watson R Cost of Pycnogenol® Supplementation and Traditional Diabetes Treatments per Unit of Improved Health Outcome. Chapter 27 in R.R. Watson et al., (eds.), Nutrients, Dietary Supplements, and Nutriceuticals: Cost Analysis Versus Clinical Benefits, Nutritions and Health, Springer Science+Business Media LLC 2011
Ref. 381	The combination of Pycnogenol [®] and the ß-blocker Carvedilol improve the myocardial function in diabetic mellitus animals. Pycnogenol [®] improves values of heamodynamic parameters – contraction and coronary flow. Králová E, Jankyová S, Pekárik A, Cubon J, Stankovicová T Carvedilol and Pycnogenol [®] improve the function of diabetic heart in rats. Acta Fax Pharm Univ Comen LX, 2013 (1)
Ref. 360	CLINICAL STUDY: Pycnogenol® improves all signs and symptoms of metabolic syndrome to healthy values within three months. Belcaro G, Cornelli U, Luzzi R, Cesarone MR, Dugall M, Feragalli B, Errichi S, Ippolito E, Grossi MG, Hosoi M, Cornelli M, Gizzi G Pycnogenol® supplementation improves health risk factors in subjects with metabolic syndrome. Phytother Res 27: 1572-1578, 2013



Diabetic Syndrome

Ref. 334	In pharmacological experiments Pycnogenol [®] is demonstrated to protect renal cells from glucose damage in a diabetic nephropathy model. Kim YJ, Kim YA, Yokozawa T Pycnogenol [®] modulates apoptosis by suppressing oxidative stress and inflammation in high glucose-treated renal tubular cells. Food Chem Toxicol 49: 2196-2201, 2011
Ref. 308	Pycnogenol® provides antioxidant protective effects to the liver in an animal diabetes model. Parveen K, Khan MR, Mujeeb M, Siddiqui WA Protective effects of Pycnogenol® on hyperglycemia-induced oxidative damage in the liver of type 2 diabetic rats. Chem Biol Interact 186: 219 -227, 2010
Ref. 300	Pycnogenol® is shown in an in vitro model to facilitate better glucose uptake by fat cells which suggests anti- diabetic benefits. Lee HH, Kim K-J, Lee OH, KJ, Lee BY Effect of Pycnogenol® on glucose transport in mature 3T3-L1 adipocytes. Phytother Res 24: 1242-1249, 2010
Ref. 293	CLINICAL STUDY: Pycnogenol [®] improves kidney function of metabolic syndrome patients as judged by lowered urinary albumins and improved kidney perfusion. Stuard S, Belcaro G, Cesarone MR, Ricci A, Cornelli U, Gizzi G Kidney function in metabolic syndrome may be improved with Pycnogenol [®] . Panminerva Med 52 (suppl. 1 to No. 2): 27-32, 2010
Ref. 288	Pycnogenol® improves endothelial function and blood vessel morphology in an animal model. Rezzani R, Porteri E, De Ciuceis C, Bonomini F, Rodella LF, Paiardi S, Boari GEM, Platto C, Pilu A, Avanzi D, Rizzoni D, Rosei EA Effects of melatonin and Pycnogenol® on small artery structure and function in spontaneously hypertensive rats. Hypertension 55: 1373-1380, 2010
Ref. 271	CLINICAL STUDY: Pycnogenol® taken at early stages of diabetic retinopathy may partially restore vision further to strengthening retinal capillaries. Steigerwalt R, Belcaro G, Cesarone MR, Di Renzo A, Grossi MG, Ricci A, Dugall M, Cacchio M, Schönlau F Pycnogenol® improves microcirculation, retinal edema, and visual acuity in early diabetic retinopathy. J Ocul Pharmacol Ther 25: 537-540, 2009
Ref. 261	This review article comprises the manifold contributions of Pycnogenol® to people who have diabetes. Rohdewald P Regulation of diabetes by Pycnogenol®. Botanical medicine in clinical practice. (ed.) Watson, R.R., Preedy, V.R.; Wallingford, England, CABI Publishing, Ch. 62: 587-594, 2008
Ref. 237	CLINICAL STUDY: Pycnogenol [®] given in addition to diabetic and hypertensive medication significantly further improves blood sugar and cardio-vascular risk factors and allows a majority of patients to lower anti- hypertensive medication. Zibadi S, Rohdewald P, Park D, Watson RR Reduction of cardiovascular risk factors in subjects with Type 2 Diabetes by Pycnogenol [®] supplementation. Nutr Res 28: 315-320, 2008
Ref. 233	Pycnogenol [®] lowers platelet hyperactivity more effectively than aspirin in a type I diabetes pharmacologic model suggesting a protective effect from thrombosis in diabetes. Nocun M, Ulicna O, Muchova J, Durackova Z, Watala C French maritime pine bark extract (Pycnogenol [®]) reduces thromboxane generation in blood from diabetic male rats. Biomed Pharmacother 62: 168-172, 2007



Diabetic Syndrome

Ref. 209	Pycnogenol® inhibits dietary carbohydrate absorption by inhibition of alpha-glucosidase. Schäfer A, Högger P Oligomeric procyanidins of French maritime pine bark extract (Pycnogenol®) effectively inhibit alpha-glucosidase. Diabetes Res Clin Pract 77: 41-46, 2007
Ref. 199	CLINICAL STUDY: Pycnogenol [®] reduces diabetic microangiopathy. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, Vinciguerra G, Ricci A, Gizzi G, Ippolito E, Fano F, Dugall M, Cipollone G, Acerbi G, Cacchio M, Del Boccio G, Di Renzo A, Stuard S, Corsi M Improvement of diabetic microangiopathy with Pycnogenol [®] : A prospective, controlled study. Angiology 57: 431-436, 2006
Ref. 195	CLINICAL STUDY: Pycnogenol [®] accelerates healing of diabetic ulcers. Belcaro G, Cesarone MR, Errichi BM, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Gizzi G, Rohdewald P, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M Diabetic ulcers: microcirculatory improvement and faster healing with Pycnogenol [®] . Clin Appl Thromb Hemost 12: 318-323, 2006
Ref. 184	Pycnogenol® increases anti-oxidative enzyme concentrations in the retina of rats, suggesting a lower risk for retinopathy and cataract formation. Kamuren ZT, McPeek CG, Sanders RA, Watkins JB Effects of low-carbohydrate diet and Pycnogenol® treatment on retinal antioxidant enzymes in normal and diabetic rats. J Ocul Pharmacol Ther 22: 10-18, 2006
Ref. 156	Pycnogenol [®] either alone or in combination with other antioxidants stimulates antioxidant enzyme activities in the retina of diabetic rats. Dene BA, Maritime AC, Sanders RA, Watkins JB Effects of Antioxidant Treatment on Normal and Diabetic rat retinal enzyme activities. J Ocul Pharmacol Ther 21: 28-35, 2005
Ref. 153	Pycnogenol® either alone or in combination with other antioxidants reduces parameters of oxidative stress in diabetic rats. Berryman AM, Maritim AC, Sanders RA, Watkins JB Influence of treatment of Diabetic rats with combinations of Pycnogenol®, beta-carotene, and alpha-lipoic acid on parameters of oxidative stress. J Biochem Mol Toxicol 18: 345-352, 2004
Ref. 142	CLINICAL STUDY: Pycnogenol [®] supplementation to diabetic patients lowers glucose levels. Liu X, Wei J, Tan F, Zhou S, Würthwein G, Rohdewald P Antidiabetic effect of Pycnogenol [®] French maritime pine bark extract in patients with diabetes type II. Life Sci, 75: 2505-2513, 2004
Ref. 109	CLINICAL STUDY: In a dose-finding study Pycnogenol [®] lowers glucose levels of type II diabetic patients and improves endothelial function. Liu X, Zhou H-J, Rohdewald P French maritime pine bark extract Pycnogenol [®] dose-dependently lowers glucose in type II diabetic patients. Diabetes Care 27: 839, 2004
Ref. 110	Pycnogenol [®] inhibits <i>in vitro</i> the Maillard reaction which results in advanced glycation end products (AGE) in diabetes. Zhang TM, Han CH, Han YW, Gong H, Zhang EY, Zhang Y Inhibitory effect of Pycnogenol [®] on generation of advanced glycation end products <i>in vitro</i> . Chin Pharmacol Bull 19: 437-440, 2003



Diabetic Syndrome

Ref. 105	Pycnogenol® lowers blood glucose and increases intracellular antioxidant defense mechanism in diabetic rats. Maritim A, Dene BA, Sanders RA, Watkins JB Effect of Pycnogenol® treatment on oxidative stress in streptozotocin-induced diabetic rats. J Biochem Mol Toxicol 17: 193-199, 2003
Ref. 092	CLINICAL STUDY: The review presents results of five clinical studies with Pycnogenol® showing the efficacy of Pycnogenol® for patients with diabetic retinopathy. Schönlau F, Rohdewald P Pycnogenol® for diabetic retinopathy: A review. Int Ophthalmol 24: 161-171, 2002
Ref. 090	CLINICAL STUDY: Pycnogenol [®] supplementation reduced blood levels of the "bad" cholesterol LDL in human volunteers. Devaraj S, Vega-López S, Kaul N, Schönlau F, Rohdewald P, Jialal I Supplementation with a pine bark extract rich in polyphenols increases plasma antioxidant capacity and alters plasma lipoprotein profile. Lipids 37: 931-934, 2002
Ref. 080	CLINICAL STUDY: Pycnogenol [®] reduces blood pressure, as shown in a randomized, double-blind, placebo- controlled study performed in mildly hypertensive patients. Furthermore, Pycnogenol [®] significantly decreases the level of the vasoconstrictor factor (thromboxane) in blood of these patients. Hosseini S, Lee J, Sepulveda RT, Rohdewald P, Watson RR A randomized, double-blind, placebo-controlled, prospective, 16 week crossover study to determine the role of Pycnogenol [®] in modifying blood pressure in mildly hypertensive patients. Nutr Res 21: 1251-1260, 2001



5. Eye Health

Ref. 417	CLINICAL STUDY: Pycnogenol [®] is shown to help prevent retinal vein thrombosis. Rodriguez P, Belcaro G, Dugall M, Hu S, Luzzi R, Ledda A, Ippolito E, Corsi M, Ricci A, Feragalli B, Cornelli U, Gizzi C, Hosoi M Recurrence of retinal vein thrombosis with Pycnogenol® or Aspirin® supplementation: a registry study. Panminerva Med 57: 121-125, 2015
Ref. 271	CLINICAL STUDY: Pycnogenol® taken at early stages of diabetic retinopathy may partially restore vision further to strengthening retinal capillaries. Steigerwalt R, Belcaro G, Cesarone MR, Di Renzo A, Grossi MG, Ricci A, Dugall M, Cacchio M, Schönlau F Pycnogenol® improves microcirculation, retinal edema, and visual acuity in early diabetic retinopathy. J Ocul Pharmacol Ther 25: 537-540, 2009
Ref. 227	Pycnogenol® in combination with Lutein provides synergistic antioxidant activity for protecting retinal lipids from oxidation. Nakanishi-Ueda T, Kamegawa M, Ishigaki S, Tsukahara M, Yano S, Wada K, Yasuhara H Inhibitory Effect of Lutein and Pycnogenol® on Lipid Peroxidation in Porcine Retinal Homogenate. J Clin Biochem Nutr 38: 204-210, 2006
Ref. 184	Pycnogenol® increases anti-oxidative enzyme concentrations in the retina of rats, suggesting a lower risk for retinopathy and cataract formation. Kamuren ZT, McPeek CG, Sanders RA, Watkins JB Effects of low-carbohydrate diet and Pycnogenol® treatment on retinal antioxidant enzymes in normal and diabetic rats. J Ocul Pharmacol Ther 22: 10-18, 2006
Ref. 156	Pycnogenol [®] either alone or in combination with other antioxidants stimulates antioxidant enzyme activities in the retina of diabetic rats. Dene BA, Maritime AC, Sanders RA, Watkins JB Effects of Antioxidant Treatment on Normal and Diabetic rat retinal enzyme activities. J Ocul Pharmacol Ther 21: 28-35, 2005
Ref. 092	CLINICAL STUDY: The review contains results of 5 clinical studies with Pycnogenol® showing the efficacy of Pycnogenol® supplementation for patients with diabetic retinopathy. Schönlau F, Rohdewald P Pycnogenol® for diabetic retinopathy: A review. Int Ophthalmol 24: 161-171, 2002
Ref. 075	CLINICAL STUDY: Pycnogenol [®] shows beneficial effects in retinopathy. Spadea L, Balestrazzi E Treatment of vascular retinopathies with Pycnogenol [®] . Phytother Res 15: 219-223, 2001
Ref. 051	Pycnogenol [®] protects the retina against oxidative damage more effectively than any other antioxidant tested. Pycnogenol [®] shows synergistic antioxidant effectiveness when combined with other antioxidants such as Coenzyme Q10. Chida M, Suzuki K, Nakanishi-Ueda T, Ueda T, Yasuhara H, Koide R, Armstrong D <i>In vitro</i> testing of antioxidants and biochemical end-points in bovine retinal tissue. Ophthalmic Res 31: 407-415, 1999
Ref. 018	Pycnogenol® protects the retina of the eye against free radicals damage. Ueda T, Ueda T, Armstrong D Preventive effect of natural and synthetic antioxidants on lipid peroxidation in the mammalian eye. Ophthalmic Res 28: 184-192, 1996



6. Inflammation

Ref. 487	CLINICAL STUDY: Pycnogenol [®] patch is safe and effective to control pain and improve symptoms in idiopathic, benign, transient neck pain. Belcaro G, Dugall M, Feragalli B, et al. Prevention of symptoms associated to neck pain with a Pycnogenol [®] patch. J Sports Med Physical Fitness, ahead of print, 2018 Pharma standard (PS) supplements. Papers from the London sessions January 2018. Eds. Belcaro G, Dugall M, Ledda A. ISBN; 978-88-7711-940
Ref. 485	CLINICAL STUDY: Pycnogenol® supplementation in patients with Sjögren Syndrome in a remission phase may be effective to control inflammation and reduce symptoms. Luzzi R, Belcaro G, Hu S, et al. Efficacy of Pycnogenol® supplementation in remission phases of Sjögren syndrome. Min Cardioangiol 66(5): 543-546, 2018
Ref. 484	CLINICAL STUDY: Managing Behcet's Syndrome with Pycnogenol® supplementation is useful. Hu S, Belcaro G, Ledda A, et al. Behcet's Syndrome: Effects of Pycnogenol® addition during regression phases. Minerva Cardioangiologica 66(4): 386-390, 2018
Ref. 451	CLINICAL STUDY: Pycnogenol[®] applied topically as patch soothes muscular pain. Luzzi R, Belcaro G, Feragalli B, Dugall M Moderate, diffuse, somatic muscular pain: effects of supplementation with a Pycnogenol [®] patch. Minerva Ortopedica e Traumatologica 67(4): 170-176, 2016
Ref. 447	This pre-clinical study indicates that Pycnogenol [®] inhibits the reduction of inflammatory response in CSE- stimulated NCI-H292 cells and a COPD mouse model via the Erk-sp1 pathway. Pycnogenol [®] is suggested to have potential for improving chronic obstructive pulmonary disorder symptoms. Shin N-R, Ryu H-W, Ko J-W, Park J-W, Kwon O-K, Oh S-R, Kim J-C, Shin I-S, Ahn K-S A standardized bark extract of Pinus pinaster Aiton (Pycnogenol [®]) attenuated chronic obstructive pulmonary disease via Erk-sp 1 signaling pathway. J Ethnopharmacol 194: 412-420, 2016
Ref. 427	CLINICAL STUDY: Blood- and synovial-fluid samples were analyzed for Pycnogenol [®] constituents and metabolites to elucidate tissue distribution in humans. The study determines which compounds of the French maritime pine bark extract are absorbed and how they are distributed in the body. Högger P PL4: Pharmacokinetics and cellular effects of a French maritime pine bark extract in humans. Nutrition and Medicine 3(S1): 20, 2015
Ref. 424	Pycnogenol® counteracts inflammatory situations of brain microglia cells in pre-clinical study. Fan B, Dun S-H, Gu J-Q, Guo Y, Ikuyama S Pycnogenol attenuates the release of proinflammatory cytokines and expression of perilipin 2 in lipopolysaccharides- stimulated microglia in part via inhibition of NF-κB and AP-1 activation. PLOS ONE 10(9): e0137837.doi:10.1371/journal, 2015
Ref. 418	Pycnogenol® helps avoid post-operative development of peritoneal fibrous adhesions. Sahbaz A, Aynioglu O, Isik H, Gun BD, Cengil O, Erol O Pycnogenol prevents peritoneal adhesions. Arch Gynecol Obstet. 292: 1279-1284, 2015
Ref. 413	Pycnogenol[®] is suggested to protect from ventilation-pulmonary oedema in preclinical research. Xia YF, Zhang JH, Xu ZF, Deng XM Pycnogenol, a compound isolated from the bark of pinus maritime mill, attenuates ventilator-induced lung injury through inhibiting NF-κB-mediated inflammatory response. Int J Clin Exp Med 8: 1824-1833, 2015



Inflammation

Ref. 408	CLINICAL STUDY: Endothelial function is improved by Pycnogenol [®] . Results of this open registry study indicate an important preventive possibility for borderline hypertensive, hyperglycemic and hyperlipidemic subjects. Hu S, Belcaro G, Cornelli U, Luzzi R, Cesarone MR, Dugall M, Feragalli B, Errichi B, Ippolito E, Grossi MG, Hosoi M, Gizzi G, Trignani M Effects of Pycnogenol [®] on endothelial dysfunction in borderline hypertensive, hyperlipidemic, and hyperglycemic individuals: the borderline study. Int Angiol 34(1): 43-52, 2015
Ref. 396	CLINICAL STUDY: Pycnogenol [®] decreases symptoms of common cold and shorten its course also preventing some complications. Belcaro G, Shu H, Luzzi R, Dugall M, Ippolito E, Cesarone MR, Corsi M, Feragalli B Improvement of common cold with Pycnogenol [®] : a Winter registry study. Panminvera Med 56: 301-308, 2014
Ref. 387	CLINICAL STUDY: The combination of oral contraceptives with Pycnogenol [®] shows a positive synergetic effect on the eutopic endometrium of endometriosis patients. Maia H, Haddad C, Pinheiro N, Casoy J The Effect of Oral Contraceptives Combined With Pycnogenol (Pinus Pinaster) On Aromatase and VEGF Expression in the Eutopic Endometrium of Endometriosis Patients. Gynecol Obstet 4:2, 2014
Ref. 283	CLINICAL STUDY: Pycnogenol [®] significantly lowers the inflammatory marker CRP in hypertensive patients with chronic kidney disease. Cesarone MR, Belcaro G, Stuard S, Schönlau F, Di Renzo A, Grossi MG, Dugall M, Cornelli U, Cacchio M, Gizzi G, Pellegrini L. Kidney Flow and Function in Hypertension: Protective Effects of Pycnogenol [®] in Hypertensive Participants - A Controlled Study. J Cardiovasc Pharmacol Ther 15: 41-46, 2010
Ref. 272	CLINICAL STUDY: Pycnogenol® inhibits the generation of COX-2 and 5-LOX enyzmes in pharmacological investigations of inflammatory processes in humans. Canali R, Comitato R, Schönlau F, Virgili F The anti-inflammatory pharmacology of Pycnogenol® in humans involves COX-2 and 5-LOX mRNA expression in leukocytes. Int Immunopharmacol 9: 1145-1149, 2009
Ref. 250	CLINICAL STUDY: Pycnogenol [®] significantly lowers the inflammatory marker CRP in patients with osteoarthritis, thus demonstrating its anti-inflammatory potency. Belcaro G, Cesarone MR, Errichi S, Zulli C, Errichi BM, Vinciguerra G, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Gizzi G, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M, Rohdewald P Variations in C-reactive protein, plasma free radicals and fibrinogen values in patients with osteoarthritis treated with Pycnogenol [®] . Redox Rep 13: 271-276, 2008
Ref. 208	Pycnogenol® <i>in vitro</i> study provides evidence of chemoprevention. Buz'Zard AR, Lau BHS Pycnogenol® reduces Talc-induced Neoplastic Transformation in Human Ovarian Cell Cultures. Phytother Res 21: 579-586, 2007
Ref. 185	CLINICAL STUDY: Pycnogenol [®] inhibits key triggers involved in the initiation of an inflammation in a pharmacological investigation in humans. Grimm T, Chovanova Z, Muchova J, Sumegova K, Liptakova A, Durackova Z, Högger P Inhibition of NF-kappaB activation and MMP-9 secretion by plasma of human volunteers after ingestion of maritime pine bark extract (Pycnogenol [®]). J Inflamm 3: 1-6, 2006



Inflammation

Ref. 183	Pycnogenol® protects intestinal mucosa against radiotherapy induced damage: histo-morphological evidence in rats. Ramos FM, Schönlau F, Novaes PD, Manzi FR, Bóscolo FN, Almeida SM Pycnogenol® protects against ionizing radiation as shown in the intestinal mucosa of rats exposed to X-rays. Phytother Res 20: 676-679, 2006
Ref. 176	Pycnogenol [®] non-selectively inhibits the activity of enzymes involved in pain sensation during inflammation. Schäfer A, Chovanová Z, Muchová J, Sumegová K, Liptáková A, Duracková Z, Högger P Inhibition of COX-1 and COX-2 activity by plasma of human volunteers after ingestion of French maritime pine bark extract (Pycnogenol [®]). Biomed Pharmacother 60: 5-9, 2005
Ref. 154	Pycnogenol® significantly counteracts inflammatory damage of the colon in an experimental animal model. Mochizuki M, Hasegawa N Therapeutic efficacy of Pycnogenol® in experimental inflammatory bowel diseases. Phytother Res 18: 1027-1028, 2004
Ref. 107	Matrix metalloproteinases, enzymes involved in connective tissue destruction, are potently inhibited by Pycnogenol® as well as its metabolites found in blood of humans. Grimm T, Schäfer A, Högger P Antioxidant activity and inhibition of matrix metalloproteinases by metabolites of maritime pine bark extract (Pycnogenol®). J Free Radic Biol Med 36: 811-822, 2004
Ref. 074	CLINICAL STUDY: Pycnogenol [®] dose-dependently inhibits UV-induced erythema in humans. This effect was found to be associated to the anti-inflammatory potency of Pycnogenol [®] . Saliou C, Rimbach G, Moini H, McLaughlin L, Hosseini S, Lee J, Watson RR, Packer L Solar ultraviolet-induced erythema in human skin and nuclear factor-kappa-B-dependent gene expression in keratinocytes are modulated by French maritime pine bark extract. J Free Radic Biol Med 30: 154-160, 2001
Ref. 068	Pycnogenol® inhibits several mechanisms related to recruitment of leukocytes to tissue which results in anti- inflammatory activity. Peng Q, Wei Z, Lau BHS Pycnogenol® inhibits tumor necrosis factor-α-induced nuclear factor kappa B activation and adhesion molecule expression in human vascular endothelial cells. Cell Mol Life Sci 57: 834-841, 2000
Ref. 019	Pycnogenol [®] produces anti-inflammatory and anti-oedema effects in two different models. Topical application of Pycnogenol [®] gel protects the skin against UV radiation. Blazso G, Gabor M, Rohdewald P Antiinflammatory activities of procyanidin containing extracts from <i>Pinus pinaster</i> Ait. after oral and cutaneous application. Pharmazie 52: 380-382, 1997
Ref. 010	Pycnogenol [®] scavenges superoxide radicals <i>in vitro</i> and inhibits oedema <i>in vivo</i> . The anti-inflammatory and free radical scavenging activities are closely correlated. Blazso G, Gabor M, Sibbel R, Rohdewald P Anti-inflammatory and superoxide radical scavenging activities of a procyanidins containing extract from the bark of <i>Pinus pinaster</i> sol. and its fractions. Pharm Parmacol Lett 3: 217-220, 1994



7. Joint Health

Ref. 477	CLINICAL STUDY: Patients with knee osteoarthritis control their symptoms and mild to moderate pain and inflammation with a Pycnogenol® patch. Feragalli B, Dugall M, Luzzi R, Ledda A, Hosoi M, Belcaro G, Cesarone MR Pycnogenol®: supplementary management of symptomatic osteoarthritis with a patch. An observational registry. Minerva Endocrinologica – ahead of print, 2018 Pharma standard (PS) supplements. Papers from the London sessions January 2018. Eds. Belcaro G, Dugall M, Ledda A. ISBN; 978-88-7711-940
Ref. 464	CLINICAL STUDY: Pycnogenol [®] 's effects were systematically researched in patient's chondrocytes, synovial fluid and serum. The overall results suggest a chondroprotective potential of the maritime pine bark extract and provide a rational basis for understanding the reported clinical effects on symptom scores in OA patients. Jessberger S, Högger P, Genest F, Salter DM, Seefried L Cellular pharmacodynamic effects of Pycnogenol [®] in patients with severe osteoarthritis: a randomized controlled pilot study. BMC Complementary and Alternative Medicine 17: 537 DOI 10.1186/s12906-017-2044-1, 2017
Ref. 461	Review: Pycnogenol [®] with its anti-inflammatory and chondroprotective effects acts like a sustained-release formulation by its combination of fast absorbed phenolic compounds and slowly metabolized procyanidins. Rohdewald PJ Review on sustained relief of osteoarthritis symptoms with a proprietary extract from pine bark extract, Pycnogenol [®] . J Med Food 21(1): 1-4, 2018
Ref. 440	CLINICAL STUDY: Supplementation with Pycnogenol [®] is demonstrated to lead to accumulation of constituents and metabolites in knee synovial fluid in osteoarthritis patients, representing the basis for symptom improvement. Mülek M, Seefried L, Genest F, Högger P Distribution of constituents and metabolites of maritme pine bark extract (Pycnogenol [®]) into serum, blood cells and synovial fluid of patients with severe osteoarthritis: a randomized controlled trial. Nutrients 9, 443; doi: 10.3390/nu9050443, 2017
Ref. 330	Pycnogenol [®] helps prevent bone demineralization in an osteoporosis animal model. Takano T, Kozai Y, Kawamata R, Wakao H, Sakurai T, Kashima I Inhibitory effect of maritime pine bark extract (Pycnogenol [®]) on deterioration of bone structure in the distal femoral epiphysis of ovariectomized mice. Oral Radiol 27: 8-16, 2011
Ref. 272	CLINICAL STUDY: Pycnogenol® inhibits the generation of COX-2 and 5-LOX enyzmes in pharmacological investigations of inflammatory processes in humans. Canali R, Comitato R, Schonlau F, Virgili F The anti-inflammatory pharmacology of Pycnogenol® in humans involves COX-2 and 5-LOX mRNA expression in leukocytes. Int Immunopharmacol 9: 1145-1149, 2009
Ref. 250	CLINICAL STUDY: Pycnogenol [®] significantly lowers the inflammatory marker CRP in patients with osteoarthritis, thus demonstrating its anti-inflammatory potency. Belcaro G, Cesarone MR, Errichi S, Zulli C, Errichi BM, Vinciguerra G, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Gizzi G, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M, Rohdewald P Variations in C-reactive protein, plasma free radicals and fibrinogen values in patients with osteoarthritis treated with Pycnogenol [®] . Redox Rep 13: 271-276, 2008
Ref. 249	CLINICAL STUDY: Pycnogenol® improves flexibility of osteoarthritic joints, lowers pain and allows patients to decrease their pain medication. Cisar P, Jany R, Waczulikova I, Sumegova K, Muchova J, Vojtassak J, Durackova Z, Lisy M, Rohdewald P Effect of pine bark extract (Pycnogenol®) on symptoms of knee osteoarthritis. Phytother Res 22: 1087-1092, 2008



Joint Health

CLINICAL STUDY: Pycnogenol [®] improves pain and mobility in osteoarthritis in 156 patients. Belcaro G, Cesarone MR, Errichi S, Zulli C, Errichi BM, Vinciguerra G, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Errichi S, Gizzi G, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M, Rohdewald P Treatment of osteoarthritis with Pycnogenol [®] . The SVOS (San Valentino Osteo-Arthrosis Study). Evaluation of Signs, Symptoms, Physical Performance and Vascular Aspects. Phytother Res 22: 518-523, 2008
CLINICAL STUDY: In osteoarthritis Pycnogenol [®] reduces pain and joint stiffness and decreases the required NSAID medication. Farid R, Mirfeizi Z, Mirheidari M, Rezaieyazdi Z, Mansouri H, Esmaelli H, Zibadi S, Rohdewald P, Watson RR Pycnogenol [®] supplementation reduces pain and stiffness and improves physical function in adults with knee osteoarthritis. Nutr Res 27: 692-697, 2007
CLINICAL STUDY: Pycnogenol [®] inhibits key triggers involved in the initiation of an inflammation in a pharmacological investigation in humans. Grimm T, Chovanova Z, Muchova J, Sumegova K, Liptakova A, Durackova Z, Högger P Inhibition of NF-kappaB activation and MMP-9 secretion by plasma of human volunteers after ingestion of maritime pine bark extract (Pycnogenol [®]). J Inflamm 3: 1-6, 2006
Pycnogenol® non-selectively inhibits the activity of enzymes involved in pain sensation during inflammation in humans. Schäfer A, Chovanová Z, Muchová J, Sumegová K, Liptáková A, Duracková Z, Högger P Inhibition of COX-1 and COX-2 activity by plasma of human volunteers after ingestion of French maritime pine bark extract (Pycnogenol®). Biomed Pharmacother 60: 5-9, 2005
Pycnogenol [®] as well as its metabolites found in blood of humans potently inhibit matrix metalloproteinases, enzymes involved in cartilage destruction. Grimm T, Schäfer A, Högger P Antioxidant activity and inhibition of matrix metalloproteinases by metabolites of maritime pine bark extract (Pycnogenol [®]). J Free Radic Biol Med 36: 811-822, 2004
-



8. Allergies & Asthma

Ref. 452	Pycnogenol[®] is shown in preclinical research to help manage allergic rhinitis. Günel C, Demirci B, Eryilmaz A, Yilmaz M, Meteoglu I, Ömürlü IK, Basal Y Inhibitory Effect of Pycnogenol [®] on Airway Inflammation in Ovalbumin-Induced Allergic Rhinitis. Balkan Me J 33: 620-626, 2016
Ref. 447	This pre-clinical study indicates that Pycnogenol [®] inhibits the reduction of inflammatory response in CSE- stimulated NCI-H292 cells and a COPD mouse model via the Erk-sp1 pathway. Pycnogenol [®] is suggested to have potential for improving chronic obstructive pulmonary disorder symptoms. Shin N-R, Ryu H-W, Ko J-W, Park J-W, Kwon O-K, Oh S-R, Kim J-C, Shin I-S, Ahn K-S A standardized bark extract of Pinus pinaster Aiton (Pycnogenol [®]) attenuated chronic obstructive pulmonary disease via Erk-sp 1 signaling pathway. J Ethnopharmacol 194: 412-420, 2016
Ref. 444	Review comprising Pycnogenol® virtues for allergic rhinitis (hayfever). Ross SM Allergic Rhinitis. A proprietary extract of Pinus pinaster Aiton (Pycnogenol) is found to improve the symptoms associated with allergic rhinitis. Hollist Nurs Pract 30: 301-304, 2016
Ref. 441	CLINICAL STUDY: Research finds Pycnogenol® effective for allergies. Belcaro G, Feragalli B, Hosoi M, Dugall M, Cornelli U Pycnogenol® reduces the wheal and flare response to histamine in normal subjects. Minerva Biotecnologica 28(2): 114-119, 2016
Ref. 380	Pycnogenol[®] inhibits asthma in rats. Shin I-S, Shin N-R, Jeon C-M, Hong J-M, Kwon O-K, Kim J-C, O S-R, Hahn K-W, A K-S Inhibitory effects of Pycnogenol [®] (French maritime pine bark extract) on airway inflammation in ovalbumin-induced allergic asthma. Food Chem Toxicol 62: 681-686, 2013
Ref. 344	CLINICAL STUDY: Pycnogenol® helps to deal with allergic asthma symptoms and allows for lowering medication dosage. Belcaro G, Luzzi R, Cesinaro Di Rocco P, Cesarone MR, Dugall M, Feragalli B, Errichi BM, Ippolito E, Grossi MG, Hosoi M, Errichi S, Cornelli U, Ledda A, Gizzi G Pycnogenol® improvements in asthma management. Panminerva Med 53: 57-64, 2011
Ref. 287	CLINICAL STUDY: Pycnogenol® taken prior to the onset of allergen season lowers hay-fever symptoms and pollen-specific antibodies in allergic people. Wilson D, Evans M, Guthrie N, Sharma, P, Baisley J, Schönlau F, Burki C A randomized, double blind, placebo controlled exploratory study to evaluate the potential of Pycnogenol® for improving allergic rhinitis symptoms. Phytother Res 24: 1115-1119, 2010
Ref. 270	In animal experiments Pycnogenol® suppressed an immediate immunoglobulin type E mediated allergic response. This suggests that Pycnogenol® would have general anti-allergic effectiveness. Choi YH, Yan GH Pycnogenol® inhibits immunoglobulin E-mediated allergic response in mast cells. Phytother Res 23: 1691-1695, 2009
Ref. 149	CLINICAL STUDY: Pycnogenol [®] improves pulmonary functions and reduces symptoms of asthma in children. Lau BHS, Riesen SK, Truong KP, Lau EW, Rohdewald P, Barreta RA Pycnogenol [®] as an adjunct in the management of childhood asthma. J Asthma 41: 825-832, 2004



Allergies & Asthma

Ref. 089	Pycnogenol® blocks release of histamine from mast cells <i>in vitro</i> to the same extent as the antiasthmatic drug DNCG. Sharma SC, Sharma S, Gulati OP Pycnogenol® inhibits the release of histamine from mast cells. Phytother Res 17: 66-69, 2003
Ref. 077	CLINICAL STUDY: Pycnogenol® reduces asthma symptoms and improves lung function of asthmatic patients in a placebo-controlled, cross-over study. Hosseini S, Pishnamazi S, Sadrzadeh MH, Farid F, Farid R, Watson RR Pycnogenol® in the management of asthma. J Med Food 4: 201-209, 2001



9. Women's Health, Fertility & the Reproductive System

Ref. 462	Review: Pycnogenol® improves women's health in a non-hormonal way. Rohdewald PJ Pycnogenol®, a Plant Extract for Women's Health. Int J Women's Health Care (IJWHC) 2(1): 1-5, 2017
Ref. 453	CLINICAL STUDY: Further to alleviating menopausal symptoms, Pycnogenol® significantly improves blood sugar and -lipids, and supports healthy blood pressure, CRP- and homocysteine values. Luzzi R, Belcaro G, Hosoi M, Feragalli B, Cornelli U, Dugall M, Ledda A Normalization of cardiovascular risk factors in peri-menopausal women with Pycnogenol®. Minerva Ginecol 69: 29-34, 2017
Ref. 449	A review on the efficacy of Pycnogenol [®] to alleviate climacteric symptoms by improving endothelial function and antioxidative status. Rohdewald P Relief from Menopausal Symptoms by Non-hormonal Treatment with Pycnogenol [®] (French Maritime Pine Bark Extract). J Genit Syst & Disor 5: 4, 2016
Ref. 423	Pycnogenol® inhibits bone demineralisation in preclinical menopause research. Huang G, Wu J, Wang S, Wei Y, Chen F, Chen J, Shi J, Xia J Pycnogenol [®] treatment inhibits bone mineral density loss and trabecular deterioration in ovariectomized rats. Int J Clin Exp Med 8(79): 10893-10901, 2015
Ref. 400	CLINICAL STUDY: In combination with low-dose oral contraceptives Pycnogenol [®] effectively decreases pain and number of bleeding days. Maia H, Haddad C, Casoy J The effect of Pycnogenol [®] on patients with dysmenorrhea using low-dose oral contraceptives. Int J Women's Health 6: 1019-1022, 2014
Ref. 392	CLINICAL STUDY: The use of Pycnogenol® improves signs and symptoms of postpartum varicose veins and venous function. Veins regain shape faster. Belcaro G, Dugall M, Luzzi R, Ippolito E, Cesarone MR Postpartum Varicose Veins: Supplementation with Pycnogenol® or Elastic Compression - A 12-Month Follow-Up. Int J Angiol DOI 10.1055/s-0033-1363784, 2014
Ref. 389	CLINICAL STUDY: The oral administration of Pycnogenol® combined with daily sunscreen application should be added as an adjuvant to other treatments of melasma. Campos V Oral administration of Pycnogenol® associated with sunscreen improve clinical symtpoms of melasma. J Am Acad Dermatol AB19 (P8471), 2014
Ref. 387	CLINICAL STUDY: The combination of oral contraceptives with Pycnogenol [®] shows a positive synergetic effect on the eutopic endometrium of endometriosis patients. Maia H, Haddad C, Pinheiro N, Casoy J The Effect of Oral Contraceptives Combined With Pycnogenol (Pinus Pinaster) On Aromatase and VEGF Expression in the Eutopic Endometrium of Endometriosis Patients. Gynecol Obstet 4:2, 2014
Ref. 383	CLINICAL STUDY: In the months after pregnancy, Pycnogenol® appears to positively affect hemorrhoid signs and symptoms. Belcaro G, Gizzi G, Pellegrini M, Dugall M, Luzzi R, Corsi M, Ippolito E, Ricci A, Cesarone MR, Ledda A, Bottari A, Errichi BM Pycnogenol® in postpartum symptomatic hemorrhoids. Minerva Ginecologica 66(1): 77-84, 2014



Women's Health, Fertility & the Reproductive System

Ref. 378	CLINICAL STUDY: Pycnogenol® taken with oral contraceptives alleviates endometriosis related pain. Maia H, Haddad C, Casoy J Combining oral contraceptives with a natural nuclear factor-kappa B inhibitor for the treatment of endometriosis-related pain. Int J Womens Health 6: 35-39, 2014
Ref. 376	CLINICAL STUDY: Pycnogenol® significantly improved peri-menopausal symptoms at relatively low daily dosage of 60 mg and was demonstrated to not interfere with sexual hormone levels. Kohama T, Negami M Effect of low-dose French maritime pine bark extract on climacteric syndrome in 170 perimenopausal women. J Reprod Med 58(1-2): 39-46, 2013
Ref. 336	CLINICAL STUDY: Pycnogenol [®] significantly contributes to reduce signs and symptoms related to the menopausal transition period. Errichi S, Bottari A, Belcaro G, Cesarone MR, Hosoi M, Cornelli U, Dugall M, Ledda A, Feragalli B Supplementation with Pycnogenol [®] improves signs and symptoms of menopausal transition. Panminerva Med 53: 65-70, 2011
Ref. 220	CLINICAL STUDY: Pycnogenol® significantly lowers menstrual pain and the quantity of required analgesic medication in a multi-center study with four hospitals in Japan. Suzuki N, Uebaba K, Kohama T, Moniwa N, Kanayama N, Koike K French Maritime Pine Bark Extract Significantly Lowers the Requirement for Analgesic Medication in Dysmenorrhea. A multicenter, randomized, double-blind, placebo-controlled study. J Reprod Med 53: 338-346, 2008
Ref. 219	CLINICAL STUDY: Pycnogenol® reduces pain from endometriosis, shows less side effects than hormonal treatment and enabled some women to conceive. Kohama T, Herai K, Inoue M Effect of French Martime Pine Bark Extract on endometriosis as compared with Leuprorelin acetate. J Reprod Med 52: 703-708, 2007
Ref. 187	CLINICAL STUDY: Pycnogenol [®] improves a broad range of climacteric symptoms in a study with 200 menopausal women. Yang H-M, Liao M-F, Zhu SY, Liao M-N, Rohdewald P A randomized, double-blind, placebo-controlled trial on the effect of Pycnogenol [®] on the climacteric syndrome in peri- menopausal women. Acta Obstet Gynecol Scand 86: 978-985, 2007
Ref. 174	CLINICAL STUDY: Pycnogenol [®] reduces low-back pain in late period of pregnancy. Kohama T, Inoue M Pycnogenol [®] Alleviates Pain Associated with Pregnancy. Phytother Res 20: 232-234, 2006
Ref. 145	CLINICAL STUDY: Pycnogenol® produces analgesic effect in gynaecological disorders such as endometriosis and dysmenorrhea. It reduces menstrual cramps, abdominal pain and tenderness. Kohama T, Suzuki N, Ohno S, Inoue M Analgesic efficacy of French maritime pine bark extract in dysmenorrhea. An open clinical trial. J Reprod Med 49: 828-832, 2004
Ref. 091	CLINICAL STUDY: After treatment with Pycnogenol [®] increase in functionally normal sperm may allow infertile couples to forgo <i>in vitro</i> fertilization. Roseff SJ Improvement in sperm quality and function with French maritime pine tree bark extract. J Reprod Med 47: 821-824, 2002

.



Women's Health, Fertility & the Reproductive System

Ref. 046	CLINICAL STUDY: Pycnogenol [®] improves the morphology of spermatozoa. The percentage of non-deformed sperms in sub-fertile men was increased by 99% after supplementation with Pycnogenol [®] . Roseff S, Gulati O Improvement of sperm quality by Pycnogenol [®] . Eur Bull Drug Res 7: 33-36, 1999
Ref. 045	CLINICAL STUDY: Pycnogenol® helps in gynaecological disorders such as endometriosis and dysmenorrhea. It reduces menstrual cramps, abdominal pain and tenderness. Kohama T, Suzuki N The treatment of gynaecological disorders with Pycnogenol®. Eur Bull Drug Res 7: 30-32, 1999



10. Sport & Endurance

Ref. 428	In preclinical research Pycnogenol® is suggested to preserve synaptic function subsequent to controlled cortical impact. Norris CM, Sompol P, Roberts KN, Ansari M, Scheff SW Pycnogenol® protects CA3-CA1 synaptic function in a rat model of traumatic brain injury. Experimental Neurology 276: 5-12, 2016
Ref. 368	CLINICAL STUDY: Pycnogenol [®] reduces oxidative stress and improves physical performance in athletes. Vinciguerra G, Belcaro G, Bonanni E, Cesarone MR, Ledda A, Hosoi M, Dugall M, Cacchio M, Cornelli U Evaluation of the effects of supplementation with Pycnogenol [®] on fitness in normal subjects with the Army Physical Fitness Test and in performances of athletes in the 100-minute triathlon. J sports Med Phys Fitness 53(6): 644-654, 2013
Ref. 230	CLINICAL STUDY: Pycnogenol® consumption increases vasodilatation by 42% in young healthy men, which warrants sufficient blood and oxygen supply to performing muscle. Nishioka K, Hidaka T, Nakamura S, Umemura T, Jitsuiki D, Soga J, Goto C, Chayama K, Yoshizumi M, Higashi Y Pycnogenol®, French Maritime Pine Bark Extract, augments endothelium-dependent vasodilation in humans. Hypertens Res 30: 775-780, 2007
Ref. 189	CLINICAL STUDY: Pycnogenol [®] reduces muscular pain and cramps in athletes and in patients with vascular problems or poor blood circulation of the legs. Vinciguerra G, Belcaro G, Cesarone MR, Rohdewald P, Stuard S, Ricci A, Di Renzo A, Hosoi M, Dugall M, Ledda A, Cacchio M, Acerbi G, Fano F Cramps and muscular pain: prevention with Pycnogenol [®] in normal subjects, venous patients, athletes, claudicants and in diabetic microangiopathy. Angiology 57: 331-339, 2006
Ref. 044	CLINICAL STUDY: Pycnogenol [®] increases exercise endurance in recreational athletes by 21% on a treadmill. Pavlovic P Improved endurance by use of antioxidants.

Eur Bull Drug Res 7: 26-29, 1999



11. Cognitive Function

Ref. 474	CLINICAL STUDY: Due to Pycnogenol [®] 's effect on oxidative stress levels, a large number of positive effects in subjects with initial cognitive impairment could be shown. Hosoi M, Belcaro G, Saggino A, Luzzi R, Dugall M, Feragalli B Pycnogenol [®] supplementation in minimal cognitive dysfunction. J Neurosurg Sci 62(3): 279-284, 2018
Ref. 472	Review: Pycnogenol® is considered to have therapeutic benefits in ADHD, as it increased antioxidant levels, reduced oxidative damage and improved neurochemical status. Verlaeat AAJ, Maasakkers CM, Hermans N, Savelkoul HFJ Rationale for Dietary Antioxidant Treatment of ADHD. Nutrients 10, 405; doi: 10.3390/nu10040405, 2018
Ref. 431	CLINICAL STUDY: Pycnogenol® supplementation for 12 months improves cognition and quenches oxidative stress in normal subjects aged 55 to 70 years. Belcaro G, Dugall M, Ippolito E, Hu S, Saggino A, Feragalli B The COFU3 Study: Improvement in cognitive function, attention, mental performance with Pycnogenol® in healthy subjects (55-70) with high oxidative stress. J Neurosurg Sci 59: 437-446, 2015
Ref. 428	In preclinical research Pycnogenol [®] is suggested to preserve synaptic function subsequent to controlled cortical impact. Norris CM, Sompol P, Roberts KN, Ansari M, Scheff SW Pycnogenol protects CA3-CA1 synaptic function in a rat model of traumatic brain injury. Experimental Neurology 276: 5-12, 2016
Ref. 424	Pycnogenol® counteracts inflammatory situations of brain microglia cells in pre-clinical study. Fan B, Dun S-H, Gu J-Q, Guo Y, Ikuyama S Pycnogenol attenuates the release of proinflammatory cytokines and expression of perilipin 2 in lipopolysaccharides- stimulated microglia in part via inhibition of NF-κB and AP-1 activation. PLOS ONE 10(9): e0137837.doi:10.1371/journal, 2015
Ref. 419	Pycnogenol[®] research with double-blind, placebo-controlled protocol. Stough C, Pase MP Improving cognition in the elderly with nutritional supplements. Current Directions in Psychological Science 24: 177-183, 2015
Ref. 407	Pycnogenol® supplementation for 12 weeks appears to improve cognitive function and oxidative stress in healthy professionals. Belcaro G, Luzzi R, Dugall M, Ipppolito E, Saggino A Pycnogenol® improves cognitive function, attention, mental performance and specific professional skills in healthy professionals aged 35-55. J Neurosurg Sci 58: 239-248, 2014
Ref. 345	CLINICAL STUDY: Pycnogenol [®] significantly improves memory, cognition, attention and mood in healthy students. Luzzi R, Belcaro G, Zulli C, Cesarone MR, Cornelli U, Dugall M, Hosoi M, Feragalli B Pycnogenol [®] supplementation improves cognitive function, attention and mental performance in students. Panminerva Med 53: 75-82, 2011



Cognitive Function

Ref. 241	CLINICAL STUDY: Pycnogenol [®] significantly improves memory in 101 senior citizens with memory deficits and saves their poly-unsaturated fatty acids, such as from neuronal membranes, from oxidative destruction. Ryan J, Croft K, Wesnes K, Stough C An examination of the effects of the antioxidant Pycnogenol [®] on cognitive performance, serum lipid profile, endocrinological and oxidative stress biomarkers in an elderly population. J Psychopharmacol 22: 553-562, 2008
Ref. 231	CLINICAL STUDY: Pycnogenol [®] lowers stress-hormones in children with ADHD. Dvorakova M, Jezova D, Blazicek P, Trebaticka J, Skodacek I, Suba J, Waczulikova I, Rohdewald P, Durackova Z Urinary catecholamines in children with attention deficit hyperactivity disorder (ADHD): modulation by a polyphenolic extract from pine bark (Pycnogenol [®]). Nutr Neurosci 10: 151-157, 2007
Ref. 205	CLINICAL STUDY: Pycnogenol [®] improves antioxidant status in children with Attention Deficit Hyperactivity Disorder (ADHD). Dvorakova M, Sivonova M, Trebaticka J, Skodacek I, Waczulikova I, Muchova J, Durackova Z Research Article: The effect of polyphenolic extract from pine bark, Pycnogenol [®] , on the level of glutathione in children suffering from attention deficit hyperactivity disorder (ADHD). Redox Rep 11: 163-172, 2006
Ref. 204	CLINICAL STUDY: Pycnogenol [®] protects DNA against oxidation in children with Attention Deficit Hyperactivity Disorder (ADHD). Chovanova Z, Muchova J, Sivonova M, Dvorakova M, Zitnanova I, Waczulikova I, Trebaticka J, Skodacek I, Durackova Z Effect of polyphenolic extract, Pycnogenol [®] , on the level of 8-oxoguanine in children suffering from attention deficit/ hyperactivity disorder. Free Radic Res 40: 1003-1010, 2006
Ref. 190	CLINICAL STUDY: Pycnogenol [®] relieves hyperactivity and improves attention in children with ADHD in a double-blind placebo controlled study. Trebaticka J, Kopasova S, Hradecna Z, Cinovsky K, Skodacek I, Suba J, Muchova J, Zitnanova I, Waczulikova I, Rohdewald P, Durackova Z Treatment of ADHD with French maritime pine bark extract, Pycnogenol [®] . Eur Child Adolesc Psychiatry 15: 329-335, 2006
Ref. 083	Neuronal apoptosis (early cell death) is induced by the amyloidpeptide in the brain of Alzheimer patients. In vitro experiments demonstrated an inhibition of cell death of neurons by Pycnogenol [®] . Peng QL, Buz'Zard AR, Lau BHS Pycnogenol [®] protects neurones from amyloid β peptide-induced apoptosis. Brain Res Mol Brain Res 104: 55-65, 2002
Ref. 069	Pycnogenol [®] produces significant reduction in vascular damage caused by -amyloid proteinamyloidosis is one of the neuropathological hallmarks of Alzheimer's disease (AD). This explains the role of Pycnogenol [®] in reducing the risk of AD. Liu F, Lau BHS, Peng Q, Shah V Pycnogenol [®] protects vascular endothelial cells from β-amyloid-induced injury. Biol Pharm Bull 23: 735-737, 2000
Ref. 052	Pycnogenol® improves learning impairment and loss of memory, common symptoms of the ageing process. Liu F, Zhang Y, Lau BHS Pycnogenol® improves learning impairment and memory deficit in senescence-accelerated mice. J Anti Aging Med 2: 349-355, 1999





Cognitive Function

Ref. 048	Pycnogenol® is recommended for treatment of Attention Deficit Disorder. Hanley JL Attention Deficit Disorder. Impact Communications Inc., Green Bay, WI, USA, 17-19, 1999
Ref. 047	CLINICAL STUDY: Positive experience with Pycnogenol® in treating ADHD is mentioned in this letter to the Editor. Heimann SW Pycnogenol® for ADHD? J Am Acad Child Adolesc Psychiatry 38: 357-358, 1999



12. Skin Care

Ref. 439	Pycnogenol[®] shows pigmentation reduction in human skin. Leis Ayres E, Costa A, Eberlin S, Platto Clerici S Ex vivo study for evaluating the whitening activity of Pycnogenol [®] after exposure to ultraviolet and infrared radiations, and visible lights. Surg Cosmet Dermatol 7: 303-307, 2015
Ref. 430	CLINICAL STUDY: This article reviews earlier clinical Pycnogenol® research of the group, identifying improved skin elasticity and hydration, highlighting new findings on oral Pycnogenol® supporting fairer skin complexion, as well as improved skin barrier function. Grether-Beck S, Marini A, Jaenicke T, Krutmann J French Maritime Pine Bark Extract (Pycnogenol®) Effects on Human Skin: Clinical and Molecular Evidence. Skin Pharmacol Physiol 29: 13-17, 2016
Ref. 429	CLINICAL STUDY: The study describes significant reduction of skin pigmentation with Pycnogenol [®] supplementation, taken in addition to the use of sun-screens, in 31 women with melasma. Scharf Pinto CA, Zuchi Delfes MF, Montanheiro dos Reis L, Garbers LE, Vieira da Rosa Passos PC, Skusa de Torre D The use of Pycnogenol [®] in the treatment of melasma. Surg Cosmet Dermatol 7: 218-222, 2015
Ref. 414	CLINICAL STUDY: Research demonstrates that Pycnogenol [®] in combination with pomegranate extract brightens skin and helps decrease blotches in European and and Asian women. De Schuyteneer A, Hamon I, Rohdewald P A formulation of extracts from pine bark and pomegranate improves complexion after oral intake. Esperienze Dermatologiche 17: 7-11, 2015
Ref. 389	CLINICAL STUDY: The oral administration of Pycnogenol® combined with daily sunscreen application should be added as an adjuvant to other treatments of melasma. Campos V Oral administration of Pycnogenol® associated with sunscreen improve clinical symtpoms of melasma. J Am Acad Dermatol AB19 (P8471), 2014
Ref. 388	CLINICAL STUDY: Most common clinical aspects of psoriasis could be improved by Pycnogenol [®] supplementation. Belcaro G, Luzzi R, Hu S, Cesarone MR, Dugall M, Ippolito E, Corsi M, Caporale S Improvement in signs and symptoms in psoriasis patients with Pycnogenol [®] supplementation. Panminerva Med 56: 41-48, 2014
Ref. 348	CLINICAL STUDY: Pycnogenol [®] increases women's skin elasticity and hydration which coincides with significantly new collagen and hyaluronic acid synthesis in their skin. Marini A, Grether-Beck S, Jaenicke T, Weber M, Burki C, Formann P, Brenden H, Schönlau F, Krutmann J Pycnogenol [®] Effects on Skin Elasticity and Hydration Coincide with Increased Gene Expressions of Collagen Type I and Hyaluronic Acid Synthase in Women. Skin Pharmacol Physiol 25: 86-92, 2012
Ref. 243	Pycnogenol [®] inhibits pigment formation in skin cells four times more potently than kojic acid, a compound commonly used in skin-whitening products. Kim YJ, Kang KS, Yokozawa T The anti-melanogenic effect of Pycnogenol [®] by its anti-oxidative actions. Food and Chemical Toxicol 46: 2466-2471, 2008
Ref. 211	Beneficial effects of Pycnogenol [®] in wrinkles- A review article. Rona C, Vailati F, Berardesca E The cosmetic treatment of wrinkles. J Cosmet Dermatol 3: 26-34, 2004



Skin Care

Ref. 195	CLINICAL STUDY: Pycnogenol [®] accelerates healing of diabetic ulcers in humans. Belcaro G, Cesarone MR, Errichi BM, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Gizzi G, Rohdewald P, Ippolito E, Ricci A, Cacchio M, Cipollone G, Ruffini I, Fano F, Hosoi M Diabetic Ulcers: Microcirculatory Improvement and Faster Healing with Pycnogenol [®] . Clin Appl Thromb Hemost 12: 318-323, 2006
Ref. 193	Oral administration of Pycnogenol [®] is able to delay and to reduce skin cancer following UV radiation. Kyriazi M, Yova D, Rallis M, Lima A Cancer chemopreventive effects of Pinus maritima bark extract on ultraviolet radiation and ultraviolet radiation-7,12 dimethylbenz(a) anthracene induced skin carcinogenesis of hairless mice. Cancer Lett 237: 234-241, 2006
Ref. 185	CLINICAL STUDY: Pycnogenol [®] inhibits release of enzymes involved in breaking-down collagen and elastin in inflamed skin in humans. Grimm T, Chovanova Z, Muchova J, Sumegova K, Liptakova A, Durackova Z, Högger P Inhibition of NF-kappaB activation and MMP-9 secretion by plasma of human volunteers after ingestion of maritime pine bark extract (Pycnogenol [®]). J Inflamm 3: 1-6, 2006
Ref. 172	CLINICAL STUDY: Ulcers of the lower legs heal faster with orally and topically applied Pycnogenol [®] . Belcaro G, Cesarone MR, Errichi BM, Ledda A, Di Renzo A, Stuard S, Dugall M, Pellegrini L, Rohdewald P, Ippolito E, Ricci A, Cacchio M, Ruffini I, Fano F, Hosoi M Venous Ulcers: Microcirculatory Improvement and Faster Healing with Local Use of Pycnogenol [®] . Angiology 56: 699-705, 2005
Ref. 150	Pycnogenol® shows antimicrobial activity at very low concentration. Torras MAC, Faura CA, Schönlau F, Rohdewald P Anti-microbial activity of Pycnogenol®. Phytother Res 19: 647-648, 2005
Ref. 137	Evidence of percutaneous absorption of Pycnogenol® in human skin. Sarikaki V, Rallis M, Tanojo H, Panteri I, Dotsikas Y, Loukas YL, Papaioannou G, Demetzos C, Weber S, Moini H, Maibach HI, Packer L <i>In vitro</i> percutaneous absorption of pine bark extract (Pycnogenol®) in human skin. J Toxicol Cutaneous Ocul Toxicol 23: 149-158, 2004
Ref. 133	Topically applied Pycnogenol [®] dose-dependently speeds-up the wound healing process and reduces scar formation. Blazso G, Gabor M, Schönlau F, Rohdewald P Pycnogenol [®] accelerates wound healing and reduces scar formation. Phytother Res 18: 579-581, 2004
Ref. 132	CLINICAL STUDY: Supplementation with Pycnogenol [®] in combination with vitamins, minerals improves skin smoothness and elasticity in women. Segger D, Schönlau F Supplementation with Evelle [®] improves smoothness and elasticity in a double blind, placebo- controlled study with 62 women. J Dermatolog Treat 15: 222-226, 2004
Ref. 111	Pycnogenol® applied topically after sunburn inhibits photocarcinogenesis. Sime S, Reeve VE Protection from inflammation, immunosuppression and carcinogenesis induced by UV radiation in mice by topical Pycnogenol®. Photochem Photobiol 79: 193-198, 2004



Ref. 107	CLINICAL STUDY: The collagen and elastin destroying enzymes are potently inhibited by Pycnogenol® as well as its metabolites prevailing in humans after oral consumption. Grimm T, Schäfer A, Högger P Antioxidant activity and inhibition of matrix metalloproteinases by metabolites of maritime pine bark extract (Pycnogenol®). J Free Radic Biol Med 36: 811-822, 2004
Ref. 094	Review summarizing the beneficial effects of Pycnogenol® for skin care. Schönlau F The cosmeceutical Pycnogenol®. J Appl Cosmetol 20: 241-246, 2002
Ref. 081	CLINICAL STUDY: Pycnogenol [®] counteracts skin hyper-pigmentation in women. Ni Z, Mu Y, Gulati O Treatment of melasma with Pycnogenol [®] . Phytother Res 16: 567-571, 2002
Ref. 074	CLINICAL STUDY: Pycnogenol [®] dose-dependently inhibits UV-induced erythema in humans, demonstrating a potent anti-photoageing effect. Saliou C, Rimbach G, Moini H, McLaughlin L, Hosseini S, Lee J, Watson RR, Packer L Solar ultraviolet-induced erythema in human skin and nuclear factor-kappa-B-dependent gene expression in keratinocytes are modulated by French maritime pine bark extract. J Free Radic Biol Med 30: 154-160, 2001
Ref. 073	Pycnogenol® favourably affects the gene expression profile in human keratinocytes, indicating a promising potential for improving inflammatory skin disorders such as psoriasis and dermatoses. Rihn B, Saliou C, Bottin MC, Keith G, Packer L From ancient remedies to modern therapeutics: Pine bark uses in skin disorders revisited. Phytother Res 15: 76-78, 2001
Ref. 057	Pycnogenol [®] inhibits the production of adhesion molecules in human skin cells during inflammation which would contribute to relieving inflammatory skin disorders. Bito T, Roy S, Sen CK, Packer L Pine bark extract Pycnogenol [®] down regulates IFN-γ - induced adhesion of T cells to human keratinocytes by inhibiting inducible ICAM-1 expression. J Free Radic Biol Med 28: 219-227, 2000
Ref. 030	Pycnogenol [®] prolongs the lifetime of vitamin C which will contribute to higher vitamin C presence in the skin. Cossins E, Lee R, Packer L ESR studies of vitamin C regeneration, order of reactivity of natural source phytochemical preparations. Biochem Mol Biol Int 45: 583-597, 1998
Ref. 026	Pycnogenol[®] protects α -tocopherol from oxidation and extends its life-time in endothelial cells. Virgili F, Kim D, Packer L Procyanidins extracted from pine bark protect α-tocopherol in ECV 304 endothelial cells challenged by activated RAW 264.7 macrophages: role of nitric oxide peroxynitrite. FEBS Lett 431: 315-318, 1998
Ref. 019	Pycnogenol [®] produces an anti-oedema effect in two different models. Topical application of Pycnogenol [®] gel protects the skin against UV radiation. Blazso G, Gabor M, Rohdewald P Anti-inflammatory activities of procyanidin containing extracts from <i>Pinus pinaster</i> Ait. after oral and cutaneous application. Pharmazie 52: 380-382, 1997



Skin Care

Ref. 009	Pycnogenol® increases pathologically low capillary wall resistance. Pycnogenol® is shown to be the most potent among other bioflavonoids tested. Pycnogenol® provides strength to capillary walls and makes ther less permeable and thus contributes to anti-oedema, anti-inflammatory effects.
	Gabor M, Engi E, Sonkodi S
	Die Kapillarwandresistenz und ihre Beeinflussung durch wasserlösliche Flavonderivate bei spontan hypertonischen
	Ratten. Phlebologie 22: 178-182, 1993
Ref. 008	Pycnogenol [®] dose-dependently protects the skin from ultraviolet-radiation-induced oxidative stress injury (lipid peroxidation and cytotoxicity).
	Guochang Z Ultraviolet radiation-induced oxidative stress in cultured human skin fibroblasts and antioxidant protection.
	Bio Res Rep Univ Jyväskylä 33: 1-86, 1993



13. Oral Health Care

Ref. 468	CLINICAL STUDY: Pycnogenol® chewing gum is effective in reducing oral malodor by decreasing the accumulation of tongue coating and the number of hydrogen sulfide-producing bacteria in saliva. Watanabe K, Hiramine H, Toyama T, Hamada N Effects of French Pine Bark Extract Chewing Gum on Oral Malodor and Salivary Bacteria. J Nutr Sci Vitaminol 64: 185-191, 2018
Ref. 409	Supplementation with Pycnogenol® may be useful as a therapeutic and preventative agent for bone diseases such as periodontitis. Sugimoto H, Watanabe K, Toyama T, Takahashi S-s, Sugiyama S, Lee M-C-I, Hamada N Inhibitory Effect of French Pine Bark Extract, Pycnogenol®, on Alveolar Bone Resorption and on the Osteoclast Differentiation. Phytother Res 29(2): 251-259, 2015
Ref. 356	CLINICAL STUDY: Pycnogenol® applied orally, dissolved in glycerol, significantly helps control mucositis in children undergoing chemotherapy. Khurana H, Pandey RK, Saksena AK, Kumar A An evaluation of vitamin E and Pycnogenol® in children suffering from oral mucositis during cancer chemotherapy. Oral Dis 19(5): 456-464, 2012
Ref. 150	Pycnogenol [®] inhibits growth of gram-positive and negative bacteria and <i>candida albicans</i> at concentrations of 0.025%. Torras MAC, Faura CA, Schönlau F, Rohdewald P Short Communication: Antimicrobial activity of Pycnogenol [®] . Phytother Res 19: 647-648, 2005
Ref. 133	Local application of Pycnogenol [®] dose-dependently speeds-up the wound healing process and reduces scar formation. Blazso G, Gabor M, Schönlau F, Rohdewald P Pycnogenol [®] accelerates wound healing and reduces scar formation. Phytother Res 18: 579-581, 2004
Ref. 084	CLINICAL STUDY: Pycnogenol [®] administered in chewing gum reduced bleeding of the gum and reduced plaque formation on the teeth in a controlled clinical trial. Kimbrough C, Chun M, de la Roca G, Lau BHS Pycnogenol [®] chewing gum minimizes gingival bleeding and plaque formation. Phytomed 9: 410-413, 2002
Ref. 030	Pycnogenol® prolongs the lifetime of vitamin C more than other flavonoids. Cossins E, Lee R, Packer L ESR studies of vitamin C regeneration, order of reactivity of natural source phytochemical preparations. Biochem Mol Biol Int 45: 583-597, 1998



14. Benefits for Travellers

Ref. 469	CLINICAL STUDY: Pycnogenol® reduces edema and may control some thrombotic events. Belcaro G, Cornelli U, Dugall M, Hosoi M, Cotellese R, Feragalli B Long-haul flights, edema, and thrombotic events: prevention with stockings and Pycnogenol® supplementation (LONFLIT Registry Study) Minerva Cardioangiol 66: 152-159, 2018
Ref. 244	CLINICAL STUDY: Pycnogenol® significantly lowers the severity of a wide range of typical jet-lag symptoms of flight passengers travelling intercontinental routes. Belcaro G, Cesarone MR, Steigerwalt RJ, Di Renzo A, Grossi MG, Ricci A, Stuard S, Ledda A, Dugall M, Cornelli U, Cacchio M Jet-lag: Prevention with Pycnogenol®. Preliminary report: evaluation in healthy individuals and in hypertensive patients. Minerva Cardioangiol 56(5 Suppl): 3-9, 2008
Ref. 151	CLINICAL STUDY: Pycnogenol [®] effectively counteracts swelling of the lower-legs and ankles of passengers during long flights in a double-blind, placebo-controlled study. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ippolito E, Scoccianti M, Ricci A, Dugall M, Cacchio M, Ruffini I, Fano F, Acerbi G, Vinciguerra MG, Bavera P, Di Renzo A, Errichi BM, Mucci F Prevention of edema in long flights with Pycnogenol [®] . Clin Appl Thromb Hemost 11: 289-294, 2004
Ref. 135	Zinopin® (a combination of Pycnogenol® and Standardized Ginger Root Extract) – Rationale of its use as Food Supplement in Traveller's thrombosis and motion sickness. Scurr JH, Gulati OP Review article: Zinopin®- the Rationale for its use as Food Supplement in Traveller's thrombosis and motion sickness. Phytother Res 18: 687-695, 2004
Ref. 134	CLINICAL STUDY: Pycnogenol [®] prevents thrombosis in passengers on long haul flights in a double-blind, placebo-controlled trial with 200 participants. Belcaro G, Cesarone MR, Rohdewald P, Ricci A, Ippolito E, Dugall M, Griffin M, Ruffini I, Acerbi G, Vinciguerra MG, Bavera P, Di Renzo A, Errichi BM, Cerritelli F Prevention of Venous Thrombosis and Thrombophlebitis in Long-Haul Flights with Pycnogenol [®] . Clin Appl Thromb Hemost 10: 373-377, 2004
Ref. 116	CLINICAL STUDY: Pycnogenol [®] in combination with nattokinase prevents deep vein thrombosis in long-haul flights. Cesarone MR, Belcaro G, Nicolaides AN, Ricci A, Geroulakos G, Ippolito E, Brandolini R, Vinciguerra G, Dugall M, Griffin M, Ruffini I, Acerbi G, Corsi M, Riordan N, Stuard S, Bavera P, Di Renzo A, Kenyon J, Errichi BM Prevention of venous thrombosis in long-haul flights with Flite Tabs: The Lonflit- Flite randomized controlled trial. Angiology 54: 531-539, 2003
Ref. 036	CLINICAL STUDY: Pycnogenol [®] inhibits platelet aggregation in a dose-dependent manner in humans. The effect lasts for more than 6 days and unlike aspirin, it does not produce an increase in bleeding time. Pütter M, Grotemeyer KHM, Würthwein G, Araghi-Niknam M, Watson RR, Hosseini S, Rohdewald P Inhibition of smoking-induced platelet aggregation by Aspirin and Pycnogenol [®] . Thromb Res 95: 155-161, 1999



15. Immunology, Anti-Microbial & Anti-Viral Activity

Ref. 448	A review suggesting Pycnogenol® as adjunct treatment to conventional therapy for hepatitis-associated diabetes. Ezzikouri S, Jadid FZ, Hamdi S, Wakrim L, Tsukiyama-Kohara K, Benjelloun S Supplementing Conventional Treatment with Pycnogenol® May Improve Hepatitis C Virus-Associated Type 2 Diabetes: A Mini Review. J Clin Translational Hepatol 4: 228-233, 2016
Ref. 409	Supplementation with Pycnogenol® may be useful as a therapeutic and preventative agent for bone diseases such as periodontitis. Sugimoto H, Watanabe K, Toyama T, Takahashi S-s, Sugiyama S, Lee M-C-I, Hamada N Inhibitory Effect of French Pine Bark Extract, Pycnogenol®, on Alveolar Bone Resorption and on the Osteoclast Differentiation. Phytother Res 29(2): 251-259, 2015
Ref. 398	The efficacy of current standard anti-viral agents may be improved by Pycnogenol®. Ezzikouri S, Nishimura T, Kohara M, Benjelloun S, Kino Y, Inoue K, Matsumori A, Tsukijama-Kohara Inhibitory effects of Pycnogenol® on hepatitis C virus replication. Antiviral Res 113: 93-102, 2015
Ref. 396	CLINICAL STUDY: Pycnogenol® decreases symptoms of common cold and shorten its course also preventing some complications. Belcaro G, Shu H, Luzzi R, Dugall M, Ippolito E, Cesarone MR, Corsi M, Feragalli B Improvement of common cold with Pycnogenol®: a Winter registry study. Panminvera Med 56: 301-308, 2014
Ref. 395	Supplementation with Pycnogenol® ameliorates premature death by restoring immune dysfunction. Lee J, Nam D-E, Kim O-K, Lee M-Y Pycnogenol® attenuates the symptoms of immune dysfunction through restoring a cellular antioxidant status in low micronuturient-induced immune deficient mice. Nutr Res Pract 8(5): 533-538, 2014
Ref. 375	CLINICAL STUDY: Pycnogenol [®] given to children with Crohn's Disease at remission stage decreases oxidative stress levels. Kolacek M, Muchova J, Dvorakova M, Paduchova Z, Zitnanova I, Cierna I, Orszaghova Z, Szekyova D, Jajcaiova- Zednickova N, Kovacs L, Durackova Z Effects of natural polyphenols (Pycnogenol [®]) on oxidative stress markers in children suffering from Crohn's disease – a pilot study. Free Rad Res 47(8): 624-634, 2013
Ref. 369	CLINICAL STUDY: Pycnogenol [®] supplementation speeds-up recovery from a common cold, and even more efficiently in combination with vitamin C and zinc. Belcaro G, Luzzi R, Umberto C, Hu S, Dugall M, Ippolito E, Cesarone MR, Corsi M, Pellegrini L, Ledda A, Appendino G The common cold Winter Study: Effects of Pycnogenol [®] on Signs, Symptoms, Complications & Costs. Otorinolaringol 63: 151-161, 2013
Ref. 361	Pycnogenol[®] shows protective effects for prevention of Parkinson's Disease in a model system. Khan M, Kempuraj D, Thangavel R, Zaheer A Protection of MPTP-induced neuroinflammation and neurodegeneration by Pycnogenol [®] . Neurochem Int 62: 379-388, 2013
Ref. 356	CLINICAL STUDY: Pycnogenol [®] applied orally, dissolved in glycerol, significantly helps control mucositis in children undergoing chemotherapy. Khurana H, Pandey RK, Saksena AK, Kumar A An evaluation of vitamin E and Pycnogenol [®] in children suffering from oral mucositis during cancer chemotherapy. Oral Diseaes 19: 456-464, 2012



Immunology, Anti-Microbial & Anti-Viral Activity

Ref. 247	Pycnogenol® decreases HIV viral replication and T-cell interaction in cell culture experiments. Feng WY, Tanaka R, Inagaki Y, Saitoh Y, Chang MO, Amet T, Yamamoto N, Yamaoka S, Yoshinaka Y Pycnogenol®, a procyanidin-rich extract from French maritime pine, inhibits intracellular replication of HIV-1 as well as its binding to host cells. Jpn J Infect Dis 61: 279-285, 2008
Ref. 245	CLINICAL STUDY: Pycnogenol [®] helps to lower a wide range of typical side-effects patients suffer from during cancer chemo- and radiotherapy. Belcaro G, Cesarone MR, Genovesi D, Ledda A, Vinciguerra G, Ricci A, Pellegrini L, Gizzi G, Ippolito E, Dugall M, Cacchio M, Di Renzo A, Stuard S Pycnogenol [®] may alleviate adverse effects in oncologic treatment. Panminerva Med 50: 227-234, 2008
Ref. 236	Pycnogenol® increases phagocytosis of macrophages suggesting better defence against pathogenic infections. Wu TF, Hsu CY, Huang HS, Chou SP, Wu H Proteomic analysis of Pycnogenol® effects in RAW 264.7 macrophage reveals induction of cathepsin D expression and enhancement of phagocytosis. J Agric Food Chem 55: 9784-9791, 2007
Ref. 229	Pycnogenol[®] inhibits viral replication in heart muscle (myocarditis). Matsumori A, Higuchi H, Shimada M French maritime pine bark extract inhibits viral replication and prevents development of viral myocarditis. J Card Fail 13: 785-791, 2007
Ref. 228	Pycnogenol® inhibits viral replication in myocarditis. Matsumori A Treatment Options in Myocarditis. Herz 32: 452-456, 2007
Ref. 225	Pycnogenol® inhibits growth of Helicobacter pylori and their adherence to mucosal cells of the stomach . Rohdewald P, Beil W <i>In vitro</i> inhibition of Helicobacter pylori growth and adherence to gastric mucosal cells by Pycnogenol®. Phytother Res 22: 685-688, 2007
Ref. 221	Pycnogenol[®] inhibits the harmful effects of two mutagenic chemicals. Krizkova L, Chovanova Z, Durackova Z, Krajcovic J Antimutagenic <i>in vitro</i> Activity of Plant Polyphenols: Pycnogenol [®] and Ginkgo biloba Extract (EGb 761). Phytother Res 22: 384-388, 2007
Ref. 208	Pycnogenol® reduces cancerogenesis in human ovarian cells. Buzzard AR, Lau BHS Pycnogenol® reduces Talc-induced Neoplastic Transformation in Human Ovarian Cell Cultures. Phytother Res 21: 579-586, 2007
Ref. 173	Pycnogenol[®] selectively kills cancerous ovarian germ cells. Buzzard AR, Lau BHS Research article: Selective toxicity of Pycnogenol [®] for malignant ovarian germ cells <i>in vitro.</i> Int J Cancer Prev 1: 207-212, 2004
Ref. 150	Pycnogenol® shows broad anti-microbial activity <i>in vitro</i>. Torras MAC, Faura CA, Schönlau F, Rohdewald P Antimicrobial activity of Pycnogenol®. Phytother Res 19: 647-648, 2005



Immunology, Anti-Microbial & Anti-Viral Activity

Ref. 111	Pycnogenol® applied after sunburn inhibits UV-induced suppression of immune system. Sime S, Reeve VE Protection from inflammation, immunosuppression and carcinogenesis induced by UV radiation in mice by topical Pycnogenol [®] . Photochem Photobiol 79: 193-198, 2004
Ref. 102	Pycnogenol® consumption by mice infected with protozoan parasite provides several protective benefits. Kim HC, Healey JM Effects of Pine bark extract administered to immunosuppressed adult mice infected with Cryptosporidium parvum. Am J Chin Med 29: 469-475, 2001
Ref. 095	Pycnogenol® activates <i>in vitro</i> macrophages to kill more effectively invading bacteria. Shah V, Bayeta E, Lau BHS Pycnogenol® augments macrophage phagocytosis and cytokine secretion. Pak J Nutr 1: 196-201, 2002
Ref. 082	CLINICAL STUDY: Pycnogenol® shows beneficial effects in patients with lupus erythematosus. Stefanescu M, Matache C, Onu A, Tanaseanu S, Dragomir C, Constantinescu I, Schönlau F, Rohdewald P, Szegli G Pycnogenol® Efficacy in the Treatment of Systemic Lupus Erythematosus Patients. Phytother Res 15: 698-704, 2001
Ref. 059	Pycnogenol [®] selectively kills cancerous human mammary cells (MCF-7), without affecting the normal mammary cells (MCF-10). Huynh HT, Teel RW Selective induction of apoptosis in human mammary cancer cells (MCF-7) by Pycnogenol [®] . Anticancer Res 20: 2417-2420, 2000
Ref. 055	Pycnogenol [®] increases TNF-α secretion in the macrophage system in a concentration and time dependent manner indicating that it acts as modulator of the immune response in macrophages. Park YC, Rimbach G, Saliou C, Valacchi G, Packer L Activity of monomeric, dimeric, and trimeric flavonoids on NO production, TNF-alpha secretion, and NF-kappaB- dependent gene expression in RAW 264.7 macrophages. FEBS Lett 465: 93-97, 2000
Ref. 029	Pycnogenol [®] slows down the aging related process of decline in the activities of immune- and blood cells generating systems and restores their functions to normal. Liu FJ, Zhang YX, Lau BHS Pycnogenol [®] enhances immune and haemopoietic functions in senescence-accelerated mice. Cell Mol Life Sci 54: 1168-1172, 1998
Ref. 016	Pycnogenol [®] enhances the activity of the immune system in mice infected with a leukemia-causing retrovirus. Pycnogenol [®] increases the natural killer cell cytotoxicity. Cheshier JE, Ardestani-Kaboudanian S, Liang B, Araghi Niknam M, Chung S, Lane L, Castro A, Watson RR Immunomodulation by Pycnogenol [®] in retro-virus infected or ethanol-fed mice. Life Sci 58: 87-96, 1996

.

.



16. Antioxidant- & Anti-Ageing Activity

Ref. 488	CLINICAL STUDY: Pycnogenol [®] may improve the general fitness status in elderlies and decrease the burden of fatigue experienced during normal activities such as shopping, walking, house-keeping. Hosoi M, Cotellese R, Belcaro G, et al. Pycnogenol [®] : Prevention of muscular mass and strength loss in the elderlies J Sports Med Physical Fitness, ahead of print, 2018 Pharma standard (PS) supplements. Papers from the London sessions January 2018. Eds. Belcaro G, Dugall M, Ledda A. ISBN; 978-88-7711-940
Ref. 478	CLINICAL STUDY: All symptoms of benign prostatic hypertrophy were significantly improved by Pycnogenol [®] . Pycnogenol [®] may be an important option for self-management of benign prostatic hypertrophy in otherwise healthy men. Ledda A, Belcaro G, Feragalli B, Cornelli U, Dugall M, Corsi M, Cesarone MR Benign prostatic hypertrophy: Pycnogenol [®] supplementation improves prostate symptoms and residual bladder volume. Minerva Medica 109(4): 280-284, 2018
Ref. 449	A review on the efficacy of Pycnogenol [®] to alleviate climacteric symptoms by improving endothelial function and antioxidative status. Rohdewald P Relief from Menopausal Symptoms by Non-hormonal Treatment with Pycnogenol [®] (French Maritime Pine Bark Extract). J Genit Syst & Disor 5:4, 2016
Ref. 431	CLINICAL STUDY: Pycnogenol [®] supplementation for 12 months improves cognition and quenches oxidative stress in normal subjects aged 55 to 70 years. Belcaro G, Dugall M, Ippolito E, Hu S, Saggino A, Feragalli B The COFU3 Study: Improvement in cognitive function, attention, mental performance with Pycnogenol [®] in healthy subjects (55-70) with high oxidative stress. J Neurosurg Sci 59: 437-446, 2015
Ref. 430	CLINICAL STUDY: This article reviews earlier clinical Pycnogenol® research of the group, identifying improved skin elasticity and hydration, highlighting new findings on oral Pycnogenol® supporting fairer skin complexion, as well as improved skin barrier function. Grether-Beck S, Marini A, Jaenicke T, Krutmann J French Maritime Pine Bark Extract (Pycnogenol®) Effects on Human Skin: Clinical and Molecular Evidence. Skin Pharmacol Physiol 29: 13-17, 2016
Ref. 406	Pycnogenol® has a protective effect against acute hepatotoxicity. Ko J-W, Lee I-C, Park S-H, Moon C, Kang S-S, Kim S-H, Kim J-C Protective effects of pine bark extract against cisplatin-induced hepatotoxicity and oxidative stress in rats. Lab Anim Res 30(4): 174-180, 2014
Ref. 405	A single dose of 300mg Pycnogenol [®] induces apoptosis in human fibrosarcoma cells. Harati K, Slodnik P, Chromik AM, et al Pro-apoptotic effects of pycnogenol on HT1080 human fibrosarcoma cells. Int J Oncol DOI 10.3892/ijo.2015.2854, 2014
Ref. 404	Pycnogenol [®] may be a fascinating therapeutic drug candidate for the treatment of mucoepidermoid carcinoma. Yang I-H, Shin J-A, Cho S-D Pycnogenol [®] induces nuclear translocation of apoptosis-inducing factor and caspase-independent apoptosis in MC-3 human mucoepidermoid carcinoma cell line. J Cancer Prevention 19: 265-272, 2014



Antioxidant- & Anti-Ageing Activity

Ref. 401	CLINICAL STUDY: Intake of Pycnogenol [®] decreases glucose levels and increases the antioxidative capacity of plasma. Muchova J, Orszaghova Z, Zitnanova I, Trebaticky B, Breza J, Durackova Z The effect of natural polyphenols on the oxidative stress markers in patients with diabetic nephropathy. Free Rad Biol Med 72: 42, 2014
Ref. 397	Pycnogenol® improves the function of the heart in rats with experimental diabetes mellitus. Kralova E, Jankyova S, Mucaji P, Gresakova E, Stankovicova T Pycnogenol and its fractions influence the function of isolated heart in rats with experimental diabetes mellitus. J Pathology Research & Practice, 211: 156-161; 2015
Ref. 396	CLINICAL STUDY: Pycnogenol® decreases symptoms of common cold and shorten its course also preventing some complications. Belcaro G, Shu H, Luzzi R, Dugall M, Ippolito E, Cesarone MR, Corsi M, Feragalli B Improvement of common cold with Pycnogenol®: a Winter registry study. Panminvera Med 56: 301-308, 2014
Ref. 395	Supplementation with Pycnogenol [®] ameliorates premature death by restoring immune dysfunction. Lee J, Nam D-E, Kim O-K, Lee M-Y Pycnogenol [®] attenuates the symptoms of immune dysfunction through restoring a cellular antioxidant status in low micronutrient-induced immune deficient mice Nutr Res Pract 8(5): 533-538, 2014
Ref. 391	Treatment with Pycnogenol® might have a role in the prevention of sepsis-induced oxidative damage by decreasing DNA damage and increasing antioxidant status and DNA repair capacity in rats. Taner G, Aydin S, Bacanh M, Sarigöl Z, Sahin T, Ba _s saran AA and Ba _s saran N Modulating Effects of Pycnogenol® on Oxidative Stress and DNA Damage Induced by Sepsis in Rats. Phytother Res 28(11): 1692-700, 2014
Ref. 390	Pycnogenol®'s antioxidative activity leads to positive effects in depression-like behavior. Mei L, Mochizuki M, Hasegawa N Pycnogenol® Ameliorates Depression-Like Behavior in Repeated Corticosterone-Induced Depression Mice Model. BioMed Res Int Article – http://dx.doi.org/10.1155/2014/942927, 2014
Ref. 388	CLINICAL STUDY: Most common clinical aspects of psoriasis could be improved by Pycnogenol [®] supplementation. Belcaro G, Luzzi R, Hu S, Cesarone MR, Dugall M, Ippolito E, Corsi M, Caporale S Improvement in signs and symptoms in psoriasis patients with Pycnogenol [®] supplementation. Panminerva Med 56: 41-48, 2014
Ref. 385	Pycnogenol® shows beneficial effects in metabolic and cardiovascular health. Aribal-Ayral P, Özelci-Kavas G, Elhan AH Pycnogenol® supplementation and its beneficial effects in healthy rats. Saudi Med J 35(2): 195-197, 2014
Ref. 367	CLINICAL STUDY: Pycnogenol® given at 50 mg daily dosage to 155 volunteers significantly neutralises free radicals and quenches oxidative stress. Belcaro G, Hu S, Cesarone MR, Dugall M A controlled study shows daily intake of 50mg Pycnogenol® significantly lowers plasma reactive oxygen metabolites in 155 healthy smokers. Minerva Med 104(4): 439-446, 2013



Antioxidant- & Anti-Ageing Activity

Ref. 349	CLINICAL STUDY: Pycnogenol® significantly lowers oxidative stress in heart attack patients as judged from lowered blood F2-isoprostane level. Enseleit F, Sudano I, Périat D, Winnik S, Wolfrum M, Flammer AJ, Fröhlich GM, Kaiser P, Hirt A, Haile SR, Krasniqi N, Matter CM, Uhlenhut K, Högger P, Neidhart M, Lüscher TF, Ruschitzka F, Noll G Effects of Pycnogenol® on endothelial function in patients with stable coronary artery disease: a double-blind, randomized, placebo-controlled, cross-over study. Eur Heart J 33(13): 1589-97, 2012
Ref. 336	CLINICAL STUDY: Pycnogenol [®] significantly reduces oxidative stress in menopausal women. Errichi S, Bottari A, Belcaro G, Cesarone MR, Hosoi M, Cornelli U, Dugall M, Ledda A, Feragalli B Supplementation with Pycnogenol [®] improves signs and symptoms of menopausal transition. Panminerva Med 53: 65-70, 2011
Ref. 241	CLINICAL STUDY: Pycnogenol® significantly decreases F2-isoprostane plasma levels in 101 senior citizens indicating that poly-unsaturated fatty acids, such as those from neuronal membranes, are saved from oxidative destruction. Ryan J, Croft K, Wesnes K, Stough C An examination of the effects of the antioxidant Pycnogenol® on cognitive performance, serum lipid profile, endocrinological and oxidative stress biomarkers in an elderly population. J Psychopharmacol 22: 553-562, 2008
Ref. 227	Pycnogenol® and Lutein display synergistic antioxidant effects for prevention of lipid peroxidation . Nakanishi-Ueda T, Kamegawa M, Ishigaki S, Tsukahara M, Yano S, Wada K, Yasuhara H Inhibitory Effect of Lutein and Pycnogenol® on Lipid Peroxidation in Porcine Retinal Homogenate. J Clin Biochem Nutr 38: 204-210, 2006
Ref. 226	Pycnogenol® demonstrates liver protective effects, shown in animal models with acute chemical intoxication. Yang Y-S, Ahn T-H, Lee J-C, Moon C-J, Kim S-H, Jun W, Park S-C, Kim H-C, Kim J-C Protective effects of Pycnogenol® on carbon tetrachloride-induced hepato-toxicity in Sprague Dawley rats. Food Chem Toxicol 46: 380-387, 2008
Ref. 218	Pycnogenol[®] lowers oxidative stress in the liver of rats challenged with a chemical toxin. Ahn T-H, Yang Y-S, Lee J-C, Moon C-J, Kim S-H, Jun W, Park S-C, Kim J-C Ameliorative Effects of Pycnogenol [®] on Carbon Tetrachloride-Induced Hepatic Oxidative Damage in Rats. Phytother Res 21: 1015-1019, 2007
Ref. 215	Pycnogenol® protects liposomes from lipid peroxidation and shows synergistic protective effects with vitamin C and vitamin E. Sivonova M, Zitnanova I, Horakova L, Strosova M, Muchova J, Balgavy P, Dobrota D, Durackova Z The Combined Effect of Pycnogenol® with Ascorbic Acid and Trolox on the Oxidation of Lipids and Proteins. Gen Physiol Biophys 25: 379-396, 2006
Ref. 205	CLINICAL STUDY: Pycnogenol [®] improves antioxidant status in children with Attention Deficit Hyperactivity Disorder (ADHD). Dvorakova M, Sivonova M, Trebaticka J, Skodacek I, Waczulikova I, Muchova J, Durackova Z The effect of polyphenolic extract from pine bark, Pycnogenol [®] on the level of glutathione in children suffering from attention deficit hyperactivity disorder (ADHD). Redox Rep 11: 163-172, 2006
Ref. 204	CLINICAL STUDY: Pycnogenol® significantly protects DNA against oxidation in children with ADHD in a double-blind, placebo-controlled study. Chovanova Z, Muchova J, Sivonova M, Dvorakova M, Zitnanova I, Waczulikova I, Trebaticka J, Skodacek I, Durackova Z Effect of polyphenolic extract, Pycnogenol®, on the level of 8-oxoguanine in children suffering from attention deficit/ hyperactivity disorder. Free Radic Res 40: 1003-1010, 2006



Antioxidant- & Anti-Ageing Activity

Ref. 203	Pycnogenol® prevents accumulation of oxidative damaged proteins and may reduce the risk of Alzheimer's, Parkinson's and Huntington's diseases. Voss P, Horakova L, Jakstadt M, Kiekebusch D, Grune T Ferritin oxidation and proteasomal degradation: Protection by antioxidants. Free Radic Res 40: 673-683, 2006
Ref. 187	CLINICAL STUDY: Pycnogenol [®] significantly increases total antioxidant status (TAS) in a double-blind, placebo-controlled study with 155 menopausal women. Yang HM, Liao MF, Zhu SY, Liao MN, Rohdewald P A randomised, double-blind, placebo-controlled trial on the effect of Pycnogenol [®] on the climacteric syndrome in peri- menopausal women. Acta Obstet Gynecol Scand 86: 978-985, 2007
Ref. 183	Pycnogenol [®] protects intestinal mucosa against radiotherapy induced damage: Histo-morphological evidence in rats. Ramos FM, Schönlau F, Novaes PD, Manzi FR, Bóscolo FN, Almeida SM Pycnogenol [®] protects against ionizing radiation as shown in the intestinal mucosa of rats exposed to X-rays. Phytother Res 20: 676-679, 2006
Ref. 140	Pycnogenol[®] protects the membrane of human red blood cells from oxidative damage. Sivonová M, Waczulíková I, Kilanczyk E, Hrnciarová M, Bryszewska M, Klajnert B, Duracková Z The effect of Pycnogenol [®] on the erythrocyte membrane fluidity. Gen Physiol Biophys 23: 39-51, 2004
Ref. 105	Pycnogenol® lowers blood glucose and increases intracellular antioxidant defense mechanism in diabetic rats. Maritim A, Dene BA, Sanders RA, Watkins JB Effect of Pycnogenol® treatment on oxidative stress in streptozotocin-induced diabetic rats. J Biochem Mol Toxicol 17: 193-199, 2003
Ref. 099	Pycnogenol [®] in combination with other antioxidants administered as dietary supplement increases the life- span of mice. The findings suggest also beneficial effects against neurogenerative diseases. Veurink G, Liu D, Taddei K, Perry G, Smith MA, Robertson TA, Hone E, Groth DM, Atwood CS, Martins RN Reduction of inclusion body pathology in ApoE-deficient mice fed a combination of antioxidants. J Free Radic Biol Med 34: 1070-1077, 2003
Ref. 098	Pycnogenol® delays the aging process as shown by an increased life-span of fruit flies. Shuguang L, Xinwen Z, Sihong X, Gulati OP Role of Pycnogenol® in aging by increasing the Drosophila's life-span. Eur Bull Drug Res 11: 39-45, 2003
Ref. 093	CLINICAL STUDY: Pycnogenol [®] significantly elevates plasma FRAP values of men with dyslipidemia in a double-blind, placebo-controlled study. Durackova Z, Trebaticky B, Novotny V, Zitnanova I, Breza J Lipid metabolism and erectile function improvement by Pycnogenol [®] , extract from the bark of <i>Pinus pinaster</i> in patients suffering from erectile dysfunction - a pilot study. Nutr Res 23: 1189–1198, 2003
Ref. 090	CLINICAL STUDY: Pycnogenol® increases blood plasma oxygen radical absorbance capacity (ORAC) after oral consumption in human volunteers. Devaraj S, Vega-López S, Kaul N, Schönlau F, Rohdewald P, Jialal I Supplementation with a pine bark extract rich in polyphenols increases plasma antioxidant capacity and alters plasma lipoprotein profile. Lipids 37: 931-934, 2002



Antioxidant- & Anti-Ageing Activity

Ref. 086	Pycnogenol® in combination with whey increases antioxidative capacity of plasma . Janisch K, Hippeli S, Dornisch K, Kern S, Elstner EF Determination of the antioxidative potential of human plasma after supplementation with Pycnogenol® and whey. Food Res Intern 35: 257-266, 2002
Ref. 083	Neuronal apoptosis (early cell death) is induced by the amyloid-ß-peptide in the brain of Alzheimer patients. In vitro experiments demonstrated an inhibition of cell death of neurons by Pycnogenol [®] . Peng QL, Buz'Zard AR, Lau BHS Pycnogenol [®] protects neurones from amyloid ß peptide-induced apoptosis. Brain Res Mol Brain Res 104: 55-65, 2002
Ref. 072	Pycnogenol[®] selectively enhances activity of intracellular antioxidative enzymes. Bayeta E, Lau BHS Pycnogenol [®] inhibits generation of inflammatory mediators in macrophages. Nutr Res 20: 249-259, 2000
Ref. 070	Pycnogenol [®] by virtue of its high content of procyanidins has higher antioxidant potency than other plant- derived antioxidants containing relatively higher content of regular flavon(ol)s. This fact is explained on structural and functional basis. Bors W, Michel C, Stettmaier K Electron paramagnetic resonance studies of radical species of proanthocyanidins and gallate esters. Arch Biochem Biophys 374: 347-355, 2000
Ref. 069	Pycnogenol [®] produces significant reduction in vascular damage caused by β -amyloid protein. β -amyloidosis is one of the neuropathological hallmarks of Alzheimer's disease (AD). This explains the role of Pycnogenol [®] in reducing the risk of AD. Liu F, Lau BHS, Peng Q, Shah V Pycnogenol [®] protects vascular endothelial cells from β -amyloid-induced injury. Biol Pharm Bull 23: 735-737, 2000
Ref. 063	Pycnogenol [®] shows free radical scavenging activity against reactive oxygen species. It inhibits the generation of pro-inflammatory mediators confirming the anti-inflammatory and immuno-modulatory profile of Pycnogenol [®] . Cho K-J, Yun C-H, Yoon D-Y, Cho Y-S, Rimbach G, Packer L, Chung A-S Effect of bioflavonoids extracted from the bark of Pinus maritime on proinflammatory cytokine interleukin-1 production in lipopolysaccharide-stimulated raw 264.7. Toxicol Appl Pharmacol 168: 64-71, 2000
Ref. 062	Pycnogenol® blocks oxidative modification of cellular proteins more effectively than other antioxidants. Kim J, Chehade J, Pinnas JL, Mooradian AD Effect of select antioxidants on malondialdehyde modification of proteins. Nutrition 16: 1079-1081, 2000
Ref. 052	Pycnogenol® improves learning impairment and loss of memory, common symptoms of the ageing process. Liu F, Zhang Y, Lau BHS Pycnogenol® improves learning impairment and memory deficit in senescence-accelerated mice. J Anti Aging Med 2: 349-355, 1999
Ref. 051	In a comparative study Pycnogenol [®] shows more potent antioxidant activity than vitamin C and E, α-lipoic acid, Co-Q10 and grape seed. In combination Pycnogenol [®] enhances the effects of other antioxidants like Coenzyme Q10. Chida M, Suzuki K, Nakanishi-Ueda T, Ueda T, Yasuhara H, Koide R, Armstrong D <i>In vitro</i> testing of antioxidants and biochemical end-points in bovine retinal tissue. Ophthalmic Res 31: 407-415, 1999



Antioxidant- & Anti-Ageing Activity

Ref. 033	Pycnogenol® is an efficient antioxidant due to the relative stability of its corresponding radical and its regeneration by vitamin C and vitamin E homologue Trolox. Guo Q, Zhao B, Packer L Electron spin resonance study of free radicals formed from a procyanidin-rich pine (Pinus maritime) bark extract, Pycnogenol®. J Free Radic Biol Med 27: 1308-1312, 1999
Ref. 030	Pycnogenol® protects vitamin C from oxidation and recycles oxidized vitamin C more effectively than other flavonoids. Cossins E, Lee R, Packer L ESR studies of vitamin C regeneration, order of reactivity of natural source phytochemical preparations. Biochem Mol Biol Int 45: 583-597, 1998
Ref. 029	Pycnogenol [®] slows down the aging related process of decline in activities of immune- and blood cells generating systems and restores their functions to normal. Liu FJ, Zhang YX, Lau BHS Pycnogenol [®] enhances immune and haemopoietic functions in senescence-accelerated mice. Cell Mol Life Sci 54: 1168-1172, 1998
Ref. 026	Pycnogenol® protects α -tocopherol in endothelial cells. Virgili F, Kim D, Packer L Procyanidins extracted from pine bark protect α-tocopherol in ECV 304 endothelial cells challenged by activated RAW 264.7 macrophages: role of nitric oxide and peroxynitrite. FEBS Lett 431: 315-318, 1998
Ref. 025	Pycnogenol [®] inhibits the effect of oxidative stress and minimises hydroxyl radical-induced DNA damage <i>in vitro</i> . Nelson AB, Lau BHS, Ide N, Rong Y Pycnogenol [®] inhibits macrophage oxidative burst, lipoprotein oxidation and hydroxyl radical-induced DNA damage. Drug Dev Ind Pharm 24: 139-144, 1998
Ref. 022	Pycnogenol [®] in addition to its free radical scavenging property, modulates the production of nitric oxide radicals in activated inflammatory cells. Virgili F, Kobuchi H, Packer L Procyanidins extracted from Pinus maritima (Pycnogenol [®]): scavengers of free radical species and modulators of nitrogen monoxide metabolism in activated murine raw 264.7 macrophages. J Free Radic Biol Med 24: 1120-1129, 1998
Ref. 021	Pycnogenol [®] is shown to be the strongest hydroxyl- and superoxide radical scavenger among other extracts tested. In addition, Pycnogenol [®] is shown to be resistant to heat. Noda Y, Anzai K, Mori A, Kohno M, Shinmei M, Packer L Hydroxyl and superoxide anion radical scavenging activities of natural source antioxidants using the computerized JES- FR30 ESR spectrometer system. Biochem Mol Biol Int 42: 35-44, 1997
Ref. 020	Pycnogenol [®] stimulates synthesis of antioxidative enzymes in cell lining arteries thereby doubling their amount. Wei ZH, Peng QL, Lau BHS Pycnogenol [®] enhances endothelial cell antioxidant defenses. Redox Rep 3: 219-224, 1997



Antioxidant- & Anti-Ageing Activity

Ref. 014	Pycnogenol [®] protects endothelial cells lining from free radical damage. Damage to endothelial cells is considered a primary cause for atherosclerosis. Rong Y, Li L, Shah V, Lau BHS Pycnogenol [®] protects vascular endothelial cells from t-butyl hydroperoxide induced oxidant injury. Biotechnol Ther 5: 117-126, 1995
Ref. 010	Pycnogenol [®] scavenges superoxide radicals <i>in vitro</i> and inhibits oedema <i>in vivo</i> . The anti-inflammatory and free radical scavenging activities are closely correlated. Blazso G, Gabor M, Sibbel R, Rohdewald P Anti-inflammatory and superoxide radical scavenging activities of a procyanidins containing extract from the bark of <i>Pinus pinaster</i> sol. and its fractions. Pharm Parmacol Lett 3: 217-220, 1994
Ref. 007	Pycnogenol® is proven an excellent radical scavenger of enzymatically produced hydroxyl and singlet oxygen free radicals, two of the most dangerous free radical species. Elstner EF, Kleber E Radical scavenger properties of leucocyanidine. In: Das N.P., ed. Flavonoids in Biology & Medicine III: Current issues in Flavonoid Research: National University of Singapore Press: 227-235, 1990



17. Analytics, Bio-Availability & Metabolism

Ref. 473	Pycnogenol [®] can effectively reduce body weight and body fat deposition. Cong H, Zhong W, Wang Y, Ikuyama S, Fan F, Gu J Pycnogenol [®] induces browning of white adipose tissue through the PKA signaling pathway in apolipoprotein e-deficient mice. Journal of Diabetes Research Volume 2018, Article ID 9713259 https://doi.org/10.1155/2018/9713259, 2018
Ref. 465	Pycnogenol® protects the liver. It markedly suppressed genes related to hepatic lipogenesis, fatty acid uptake and lipid storage. Pycnogenol® may provide a new prophylactic approach of non-alcoholic fatty liver disease. Wang D, Cong H, Cao Y, Ikuyama S, Fan B, Gu J Pycnogenol® protects against diet-induced hepatic steatosis in Apolipoprotein-E deficient mice. Am J Physiol Endocrinol Metabol doi: 10/1152/ajpendo.000009.2017, 2018
Ref. 440	CLINICAL STUDY: Supplementation with Pycnogenol [®] is demonstrated to lead to accumulation of constituents and metabolites in knee synovial fluid in osteoarthritis patients, representing the basis for symptom improvement. Mülek M, Seefried L, Genest F, Högger P Distribution of constituents and metabolites of maritme pine bark extract (Pycnogenol [®]) into serum, blood cells and synovial fluid of patients with severe osteoarthritis: a randomized controlled trial. Nutrients 9, 443; doi: 10.3390/nu9050443, 2017
Ref. 416	Elucidation of metabolic fate of Pycnogenol® metabolites in humans. Mülek M, Fekete A, Wiest J, Holzgrabe U, Mueller MJ, Högger P Profiling a gut microbiota-generated catechin metabolite's fate in human blood cells using a metabolomic approach. J Pharm Biomed Anal 114: 71-81, 2015
Ref. 403	Report of comparison of various sample preparation methods used for detection and quantification of plant- derived compounds in human blood cells after ingesting Pycnogenol [®] . Mülek M, Högger P Highly sensitive analysis of polyphenols and their metabolites in human blood cells using dispersive SPE extraction and LC-MS/MS. Anal Bioanal Chem DOI 10.1007/s00216-014-8451-y, 2015
Ref. 379	Pycnogenol [®] acts as a promising natural compound for the prevention of fatty liver disease or atherosclerosis. Ikuyama S, Fan B, Gu J-Q, Mukae K, Watanabe H Molecular mechanism of intracellular lipid accumulation: Suppressive effect of Pycnogenol [®] in liver cells. FFHD 3(9): 252-264, 2013
Ref. 372	The metabolites developing in humans after consumption of Pycnogenol [®] are actively internalised by red blood cells, leukocytes, endothelial cells and neurons via the GLUT1 transporter. The tissue-specific accumulation represents the common denominator for Pycnogenol [®] principal modes of action, as related to inflammation control, endothelial function, and cognition benefits. Kurlbaum M, Mülek M, Högger P Facilitated Uptake of a Bioactive Metabolite of Maritime Pine Bark Extract (Pycnogenol [®]) into Human Erythrocytes. PLOS ONE 8(4): 1-10, 2013
Ref. 371	Pycnogenol® as a natural blend performs better in endothelial dysfunction than fractions of the extract. Jankyova S, Hlavackova L, Kralova E, Slazneva J, Drobna V, Zuzik P, Drafi F, Mucaji P, Racanska E The Evaluation of Efficacy of Pycnogenol® Fractions on Endothelial Dysfunction. Acta Fac Pharm Univ Comen LX(1): 7-14, 2013
Ref. 353	Pycnogenol® metabolites developing after consumption by humans accumulate in immune cells (leukocytes) for modulation of inflammatory processes. Uhlenhut K, Högger P Facilitated cellular uptake and suppression of inducible nitric oxide synthase by a metabolite of maritime pine bark extract (Pycnogenol®). Free Radic Biol Med, 53: 305-313, 2012



Analytics, Bio-Availability & Metabolism

Ref. 301	Pycnogenol® constituents are transported in the blood stream bound to albumin, whereas the metabolites are not associated to blood proteins. Kurlbaum M, Högger P Plasma protein binding of polyphenols from maritime pine bark extract (USP). J Pharm Biomed Anal 54: 127-132, 2011
Ref. 239	Pycnogenol® antagonises the neurotoxicity of alcohol, suggesting mitigation of hang-over symptoms. Siler-Marsiglio KI, Paiva M, Madorsky I, Serrano Y, Neeley A, Heaton MB Protective mechanisms of Pycnogenol® in ethanol-insulted cerebellar granule cells. J Neurobiol 61: 267-276, 2004
Ref. 197	CLINICAL STUDY: This study presents the appearance of Pycnogenol® constituents and metabolites in blood after oral administration in humans. Grimm T, Skrabala R, Chovanova Z, Muchova J, Sumegova K, Liptakova A, Durackova Z, Högger P Single and multiple dose pharmacokinetics of maritime pine bark extract (Pycnogenol®) after oral administration to healthy volunteers. BMC Clin Pharmacol 6: 4, 2006
Ref. 171	USP Monograph. Maritime Pine Extract – USP 34.1196-1197 The United States Pharmacopeia, United States Pharmacopeial Convention, Inc. official from May 1, 2011
Ref. 170	USP Monograph. Maritime Pine – USP-30.964-965 The United States Pharmacopeia, United States Pharmacopeial Convention, Inc. official from May 1, 2007
Ref. 137	Evidence of percutaneous absorption of Pycnogenol® in human skin. Sarikaki V, Rallis M, Tanojo H, Panteri I, Dotsikas Y, Loukas YL, Papaioannou G, Demetzos C, Weber S, Moini H, Maibach HI, Packer L <i>In vitro</i> Percutaneous Absorption of Pine Bark Extract (Pycnogenol®) in Human Skin. J Toxicol Cutaneous Ocul Toxicol 23: 149-158, 2004
Ref. 060	CLINICAL STUDY: Bio-kinetics (absorption, metabolism and excretion) of Pycnogenol [®] in healthy human subjects has been demonstrated by studying the excretion pattern of ferulic acid (one of the components of Pycnogenol [®]). Virgili F, Pagana G, Bourne L, Rimbach G, Natella F, Rice-Evance C, Packer L Ferulic acid excretion as a marker of consumption of a French maritime pine (Pinus maritima) bark extract. J Free Radic Biol Med 28: 1249-1256, 2000
Ref. 058	CLINICAL STUDY: Pycnogenol [®] , its components and metabolites are bio-available in humans for more than 24 hours to exert their beneficial effects. Grosse-Düweler K, Rohdewald P Urinary metabolites of French maritime pine bark extract in humans. Pharmazie 55: 364-368, 2000
Ref. 040	Pycnogenol [®] is shown to be bioavailable based on its therapeutic effects <i>in vivo</i> : The prevention of platelet aggregation and the capillary sealing effect. Valerolactones as sulphates or glucuronides appear in the urine and they represent the active metabolites of Pycnogenol [®] . Rohdewald P Bioavailabilty and metabolism of Pycnogenol [®] . Eur Bull Drug Res 7: 5-7, 1999



18. Bowel & Digestion

Ref. 475	CLINICAL STUDY: The comparison with three different strategies (Buscopan, Antispasmina Col Forte and Pycnogenol®) revealed a higher efficacy of Pycnogenol® in reducing the chronic discomfort associated to IBS. Belcaro G, Gizzi G, Pellegrini L, Feragalli B, Cotellese R, Cacchio M, Corsi M Pycnogenol® supplementation improves the control of irritable bowel syndrome symptoms. Panminerva Med 60(2): 65-69, 2018
Ref. 416	Elucidation of metabolic fate of Pycnogenol [®] metabolites in humans. Mülek M, Fekete A, Wiest J, Holzgrabe U, Mueller MJ, Högger P Profiling a gut microbiota-generated catechin metabolite's fate in human blood cells using a metabolomic approach. J Pharm Biomed Anal 114: 71-81, 2015
Ref. 209	Pycnogenol® inhibits dietary carbohydrate absorption by inhibition of alpha-glucosidase. Schäfer A, Högger P Oligomeric procyanidins of French maritime pine bark extract (Pycnogenol®) effectively inhibit alpha-glucosidase. Diabetes Res Clin Pract 77: 41-46, 2007



19. Physiology

Ref. 486

CLINICAL STUDY: Pycnogenol® may represent a useful tool to reduce levothyroxine-related side effects in patients treated with hormone replacement therapy for hypothyroidism. Belcaro G, Cornelli U, Dugall M, et al.

Pycnogenol® prevents oxidative stress and side effects in patients with hypothyroidism during levothyroxine treatment. Min Endocrinol, ahead of print, 2018

Pharma standard (PS) supplements. Papers from the London sessions January 2018. Eds. Belcaro G, Dugall M, Ledda A. ISBN; 978-88-7711-940



Horphag Research Administrative Office 71 Av. Louis Casaï CH-1216 Cointrin/Geneva Switzerland Phone +41(0)22 710 26 26 Fax +41(0)22 710 26 00 info@pycnogenol.com www.pycnogenol.com

Pycnogenol® is a registered trademark of Horphag Research. Use of this product is protected by one or more of U.S. Patents and other international patents.

The information provided in this document is for professional use only. Statements and information provided herein have not been evaluated by the Food and Drug Administration or other health authorities. This product is not intended to diagnose, treat, cure or prevent any disease. Horphag Research supplies Pycnogenol® as a raw material to manufacturers of finished products. Therefore, Horphag Research makes no claims regarding the use of finished products and each manufacturer is responsible for ensuring that any claims it chooses to make in connection with the use of its finished products fully comply with the regulatory and legal requirements of the locations in which it markets its products.