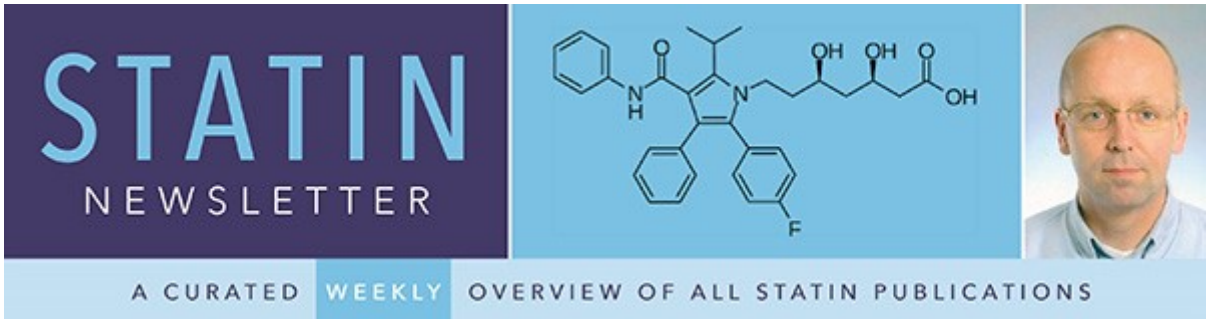

Update week 09 & 10 - 2022

Dr. Peter Lansberg is a Dutch lipidologist, educator and innovator. He has been instrumental in setting up The Dutch National Lipid Clinic Network, the Dutch Lipid Clinic Criteria for Familial Hypercholesterolemia (FH), and the Dutch National FH screening program

---

The Statin Newsletter will keep you up-to-date with all recent statin publications. Based on a curated approach to select relevant articles.

For live updates you can follow me on twitter

Key Publications

1. **Current understanding of statin side effects**
2. **Primary prevention can we afford to include more patients**
3. **Statins in elderly CAD patients shows benefits**
4. **Renal function and cholesterol synthesis/absorption**
5. **Residual risk - inflammation a promising new approach**

Side effects of statins, facts and mechanisms explained

The evidence on the CV benefits of statins is strong and reflected in all guidelines aiming to reduce CV risk. The hurdle that prevents the implementation of the appropriate statin therapy is based mainly on the notion of frequent and severe side effects associated with high doses. High-intensity statins. In this extensive review, the authors provide insights on the mechanisms responsible for documented adverse events and show that a number of the reported tolerability issues, cataracts, cognitive dysfunction, proteinuria, and hematuria, are unlikely to be caused by statins. Risk for side effects such as muscle-related complaints and new-onset diabetes can be identified and addressed by complementary therapeutic strategies or by simply choosing alternative regimens to ensure adequate lipid management in a patient considered to be at risk for ASCVD

Ruscica M, Ferri N, Banach M *et al.* Side effects of statins-from pathophysiology and epidemiology to diagnostic and therapeutic implications. Cardiovascular research 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35238338

Expanding statin indication in primary prevention is cost-effective

The impact of statins on the primary prevention of ASCVD has been firmly established; the indication to start statins is based on an estimation of a 10-year CV risk profile. In the article, the authors evaluate the concept of expanding the indication of statins for primary

prevention based on the availability of cheap generic drugs. This model aimed to evaluate the impact of expanding statin initiation in Scottish adults aged ≥40 years. They estimated the cost-effectiveness of expanding statin eligibility based on data collected in the Scottish Heart Health Extended Cohort, Scottish Morbidity Records, and National Records of Scotland. Reducing the threshold for the ages stratified ASSIGN risk score from 20% to 10% would expand statin use from 804 000 (34% of CVD-free adults) to 1 445 00 individuals (58% of CVD-free adults).
Cost-effectiveness was calculated as ICER: £12,300/QALY (£7,690/QALY-£26,500/QALY). Incremental to ASSIGN 20 % risk produced around 8,800 QALYs and was cost-effective, £7,050/QALY (£4,560/QALY-£10,700/QALY). Incremental to ASSIGN 10% produced around 7,950 QALYs and was cost-effective (£11,700/QALY (£9,250/QALY-£16,900/QALY).
Kohli-Lynch CN, Lewsey J, Boyd KA *et al.* **Beyond Ten-Year Risk: A Cost-Effectiveness Analysis of Statins for the Primary Prevention of Cardiovascular Disease.** Circulation 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35249370

Clear benefits of statins in very elderly patients after PCI

In an aging society, prevention expands to individuals of advanced age to prevent future events and arrest disease progression. In this analysis, 1 676 consecutive elderly (≥75 years) patients had a successful PCI. Patients were followed for a period of 3 years or until the occurrence of a MACE. Propensity score matching allowed to compare 466 patient pairs for outcomes based on statin use. A total of 176 MACEs occurred during the median follow-up period of 25 months. Using Kaplan Mayer survival statistics, statin treatment was associated with a reduced incidence of MACE within 30-days of PCI (P<0.001). This was observed in the follow-up period as well HR:0.55 (0.40-0.75, P<0.001). Stratification analysis for MACE Statin use showed less benefit in patients with symptomatic heart failure. Protective effects were increased in patients who suffered a stroke, peripheral artery disease, and smokers.
Horikoshi T, Nakamura T, Yoshizaki T *et al.* **A Propensity Score Matched Analysis of Statin Effects on Major Adverse Cardiac Events after Percutaneous Coronary Intervention in Patients Over 75 Years Old.** Intern Med 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35228422

Impact of renal function on markers of cholesterol absorption and cholesterol synthesis

Therapeutic approaches to reduce plasma cholesterol have expanded beyond statins in the last 10 years. The use of cholesterol absorption inhibitors, ezetimibe, is recommended as first add-on therapy in patients unable to reach LDL-c targets with statin monotherapies. Cholesterol synthesis (CS) vs. cholesterol absorption (CA) was evaluated in the CACHE (Cholesterol Absorption (CA) and Cholesterol synthesis in High-risk patiEnts) consortium. A total of 2944 patients included in this registry were evaluated to study the impact of renal function on CS and CA. Campesterol and latherosterol were used as markers for CA and CS. For the final analysis, 2200 individuals were stratified by renal function; 522 patients used hemodialysis. The median age was 58 years, and the median eGFR was 68.9 mL/min/1.73m2. With declining renal function, Campesterol and Campesterol/Latherosterol plasma concentrations increased while Latherosterol levels decreased. Sex, diabetes mellitus type 2, and statin use modified these numbers significantly
Shoji T, Akiyama Y, Fujii H *et al.* **Association of Kidney Function with Serum Levels of Cholesterol Absorption and Synthesis Markers: The CACHE Study CKD Analysis.** J Atheroscler Thromb 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35249905

Inflammation as an indicator of residual risk; how to assess and should we treat?

The detrimental effects of chronic subclinical inflammation are recognized as relevant for determining residual CVD risk and potential therapeutic targets; this review summarizes the current understanding of inflammation and how inflammation makers can reflect processes that harm the cardiovascular vessels and promote atherosclerosis and trigger atherosclerosis acute CVD complications. Targeting biomarkers or inflammation to reduce

CV risk remains the subject of active debates but could potentially shift our current paradigm of ASCVD risk management; in this review, novel therapeutic agents are presented, and trials that studied the CVD benefits of anti-inflammatory drugs, e.g., Canakinumab assessed.
Hafiane A, Daskalopoulou SS. **Targeting the residual cardiovascular risk by specific anti-inflammatory interventions as a therapeutic strategy in atherosclerosis**. Pharmacol Res 2022; 178:106157. http://www.ncbi.nlm.nih.gov/pubmed/?term=35257900

Relevant Publications

1. Ahmed F, Gross S, Hammad S *et al.* Correlation Between Atherosclerotic Cardiovascular Disease Risk Factors and Statin Prescribing Patterns. American health & drug benefits 2021; 14:140-146. http://www.ncbi.nlm.nih.gov/pubmed/?term=35261718
2. Gao H, Han J, Li G, Zhang W. Effects of rosuvastatin combined with clopidogrel bisulfate on blood lipids, cardiac function and inflammatory factor levels in elderly patients with coronary heart disease. American journal of translational research 2022; 14:1297-1304. http://www.ncbi.nlm.nih.gov/pubmed/?term=35273731
3. Su H, Lu Y, Ma C *et al.* Impact of atorvastatin on erectile dysfunction: A meta-analysis and systematic review. Andrologia 2022:e14408. http://www.ncbi.nlm.nih.gov/pubmed/?term=35224753
4. Ikhsan YK, Soelistijo SA, Putranto JNE. Profile of cardiovascular disease risk in type 2 diabetes mellitus patients receiving statin therapy: A cross-sectional study. Annals of medicine and surgery (2012) 2022; 75:103368. http://www.ncbi.nlm.nih.gov/pubmed/?term=35242320
5. Soliemanabad SK, Rasouli K, Zakariaei Z *et al.* Rhabdomyolysis due to warfarin and atorvastatin combination therapy in a patient with ischemic heart disease: (A drug interaction). Annals of medicine and surgery (2012) 2022; 75:103384. http://www.ncbi.nlm.nih.gov/pubmed/?term=35242328
6. Urbak L, Sandholt B, Græbe M *et al.* Echolucent Carotid Plaques Becomes More Echogenic over Time - A 3D Ultrasound Study. Annals of vascular surgery 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35257924
7. Daria S, Katarzyna SA, Jerzy F, Ivan K. Muscle pain and muscle weakness in COVID19 patients: Cross-talk with statins - Preliminary results. Biomedicine & pharmacotherapy = Biomedecine & pharmacotherapie 2022; 148:112757. http://www.ncbi.nlm.nih.gov/pubmed/?term=35231696
8. Heller GZ, Robledo KP, Marschner IC. Distributional regression in clinical trials: treatment effects on parameters other than the mean. BMC medical research methodology 2022; 22:56. http://www.ncbi.nlm.nih.gov/pubmed/?term=35220944
9. Rademacher JG, Glaubitz S, Zechel S *et al.* Treatment and outcomes in anti-HMG-CoA reductase-associated immune-mediated necrotising myopathy. Comparative analysis of a single-centre cohort and published data. Clinical and experimental rheumatology 2022; 40:320-328. http://www.ncbi.nlm.nih.gov/pubmed/?term=35225222
10. Gutiérrez OM. Could Phosphate Provide a Second Chance for Statin Therapy in Kidney Failure? Clin J Am Soc Nephrol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35236717
11. Massy ZA, Merkling T, Wagner S *et al.* Association of Serum Phosphate with Efficacy of Statin Therapy in Hemodialysis Patients. Clin J Am Soc Nephrol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35236715
12. Squires JE, Cho-Young D, Aloisio LD *et al.* Inappropriate use of clinical practices in Canada: a systematic review. CMAJ : Canadian Medical Association journal = journal

de l'Association medicale canadienne 2022; 194:E279-e296. http://www.ncbi.nlm.nih.gov/pubmed/?term=35228321
13. Burnett H, Fahrbach K, Cichewicz A *et al.* Comparative efficacy of non-statin lipid-lowering therapies in patients with hypercholesterolemia at increased cardiovascular risk: a network meta-analysis. Current medical research and opinion 2022:1-8. http://www.ncbi.nlm.nih.gov/pubmed/?term=35262430
14. Ginsberg HN, Hounslow NJ, Senko Y *et al.* Efficacy and Safety of K-877 (Pemafibrate), a Selective PPARα Modulator, in European Patients on Statin Therapy. Diabetes Care 2022; 45:898-908. http://www.ncbi.nlm.nih.gov/pubmed/?term=35238894
15. Lee YB, Koo M, Noh E *et al.* Myocardial Infarction, Stroke, and All-Cause Mortality According to Low-Density Lipoprotein Cholesterol Level in the Elderly, a Nationwide Study. Diabetes Metab J 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35255552
16. Yun SJ, Jeong IK, Cha JH *et al.* Current Status of Low-Density Lipoprotein Cholesterol Target Achievement in Patients with Type 2 Diabetes Mellitus in Korea Compared with Recent Guidelines. Diabetes Metab J 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35235742
17. Bideberi AT, Mutagaywa R. Statin Prescription Patterns and Associated Factors Among Patients with Type 2 Diabetes Mellitus Attending Diabetic Clinic at Muhimbili National Hospital, Dar es Salaam, Tanzania. Diabetes, metabolic syndrome and obesity : targets and therapy 2022; 15:633-646. http://www.ncbi.nlm.nih.gov/pubmed/?term=35250285
18. Tapper EB, Zhao Z, Mazumder N, Parikh ND. Incidence of, Risk Factors for, and Outcomes After Ascites in a Population-Based Cohort of Older Americans. Digestive diseases and sciences 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35262903
19. Alkabbani W, Pelletier R, Beazely MA *et al.* Drug-Drug Interaction of the Sodium Glucose Co-Transporter 2 Inhibitors with Statins and Myopathy: A Disproportionality Analysis Using Adverse Events Reporting Data. Drug Saf 2022; 45:287-295. http://www.ncbi.nlm.nih.gov/pubmed/?term=35247195
20. Stoll F, Eidam A, Michael L *et al.* Drug Treatment of Hypercholesterolemia in Older Adults: Focus on Newer Agents. Drugs Aging 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35278206
21. English AR, Prasad B, McGuigan DH *et al.* Simvastatin is associated with superior lipid and glycaemic control to atorvastatin and reduced levels of incident Type 2 diabetes, in men and women, in the UK Biobank. Endocrinology, diabetes & metabolism 2022:e00326. http://www.ncbi.nlm.nih.gov/pubmed/?term=35243827
22. Ariss RW, Gupta R. Estimated Aggregate Treatment Benefit With Addition of Multiple Novel Medications for Secondary Prevention of Atherosclerotic Cardiovascular Disease. Journal of cardiovascular pharmacology and therapeutics 2022; 27:10742484221084772. http://www.ncbi.nlm.nih.gov/pubmed/?term=35259008
23. Honig A, Percy J, Sepehry AA *et al.* Hemorrhagic Transformation in Acute Ischemic Stroke: A Quantitative Systematic Review. Journal of clinical medicine 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35268253
24. Smith KW, White CM. Inclisiran: A Novel Small Interfering RNA Drug for Low-Density Lipoprotein Reduction. Journal of clinical pharmacology 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35279835
25. Valentine KD, Brodney S, Sepucha K, Barry MJ. Predictors of Informed People's Preferences for Statin Therapy to Reduce Cardiovascular Disease Risk: an Internet Survey Study. Journal of general internal medicine 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35230620
26. Zeyneloglu HB, Tohma YA, Gunakan E *et al.* Diet and pravastatin administration prior to in vitro fertilization treatment may improve pregnancy outcome in women with dyslipidemia. J Obstet Gynaecol 2022:1-6. http://www.ncbi.nlm.nih.gov/pubmed/?term=35257641
27. Hammoud A, Shapiro MD. Drug Interactions: What Are Important Drug Interactions for the Most Commonly Used Medications in Preventive Cardiology? The Medical clinics of North America 2022; 106:389-399. http://www.ncbi.nlm.nih.gov/pubmed/?term=35227438

28. Alsadat N, Hyun K, Boroumand F *et al.* Achieving lipid targets within 12 months of an acute coronary syndrome: an observational analysis. Med J Aust 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35236004
29. Kim JH, Chang IB, Kim YH *et al.* Association between statin use and Parkinson's disease in Korean patients with hyperlipidemia. Parkinsonism & related disorders 2022; 97:15-24. http://www.ncbi.nlm.nih.gov/pubmed/?term=35276584
30. Ah YM, Jeong M, Choi HD. Comparative safety and efficacy of low- or moderate-intensity statin plus ezetimibe combination therapy and high-intensity statin monotherapy: A meta-analysis of randomized controlled studies. PLoS One 2022; 17:e0264437. http://www.ncbi.nlm.nih.gov/pubmed/?term=35245303
31. Huiskes VJB, Vriezekolk JE, van den Ende CHM *et al.* Impact of physician' and pharmacy staff supporting activities in usual care on patients' statin adherence. PLoS One 2022; 17:e0264555. http://www.ncbi.nlm.nih.gov/pubmed/?term=35226701
32. Yao S, Lix L, Teare G *et al.* An integrated continuity of care measure improves performance in models predicting medication adherence using population-based administrative data. PLoS One 2022; 17:e0264170. http://www.ncbi.nlm.nih.gov/pubmed/?term=35239713
33. Berger C, Gencer B, Nanchen D. [High-dose Omega-3 for cardiovascular prevention, a bad idea?]. Revue medicale suisse 2022; 18:434-437. http://www.ncbi.nlm.nih.gov/pubmed/?term=35266343
34. Bétrisey S, Baretella O, Blum M *et al.* [Should dyslipidemia be treated in the elderly and very old people?]. Revue medicale suisse 2022; 18:414-421. http://www.ncbi.nlm.nih.gov/pubmed/?term=35266340
35. King RW, Dias AP, MukherJee RD *et al.* Staging Endovascular Thoracic and Thoracoabdominal Aortic Aneurysm Repairs and the Risk of Post-Operative Spinal Cord Ischemia. Annals of vascular surgery 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35257921
36. Thompson PL, Hui J, Beilby J *et al.* Common genetic variants do not predict recurrent events in coronary heart disease patients. BMC Cardiovasc Disord 2022; 22:96. http://www.ncbi.nlm.nih.gov/pubmed/?term=35264114
37. Pancani S, Lombardi G, Sofi F *et al.* 12-month survival in nonagenarians inside the Mugello study: on the way to live a century. BMC geriatrics 2022; 22:194. http://www.ncbi.nlm.nih.gov/pubmed/?term=35279074
38. Benson RA, Okoth K, Keerthy D *et al.* Analysis of the relationship between sex and prescriptions for guideline-recommended therapy in peripheral arterial disease, in relation to 1-year all-cause mortality: a primary care cohort study. BMJ Open 2022; 12:e055952. http://www.ncbi.nlm.nih.gov/pubmed/?term=35273054
39. Wang CH, Huang CW, Nguyen PA *et al.* Chemopreventive Effects of Concomitant or Individual Use of Statins, Aspirin, Metformin, and Angiotensin Drugs: A Study Using Claims Data of 23 Million Individuals. Cancers 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35267516
40. Chuma M, Nakamoto A, Bando T *et al.* Association between statin use and daptomycin-related musculoskeletal adverse events: A mixed approach combining a meta-analysis and a disproportionality analysis. Clin Infect Dis 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35262686
41. Sharma A, Musurakis C, Nabil NUN *et al.* A Case Series of Statin-Induced Necrotizing Autoimmune Myopathy. Cureus 2022; 14:e21613. http://www.ncbi.nlm.nih.gov/pubmed/?term=35233301
42. Darwazeh A, Al-Shorman H, Mrayan B. Effect of statin therapy on oral Candida carriage in hyperlipidemia patients: A pioneer study. Dent Med Probl 2022; 59:93-97. http://www.ncbi.nlm.nih.gov/pubmed/?term=35230751
43. Pandey NK, Singh SK, Kumar B *et al.* Expanding arsenal against diabetes mellitus through nanoformulations loaded with glimepiride and simvastatin: A comparative study. Environmental science and pollution research international 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35254621
44. Siew KSW, Abdul Hafidz MI, Mohd Zaidan FZB, Hadi MFB. Approaches to management of rhabdomyolysis as the adverse effect of drug interaction between

atorvastatin and sacubitril/valsartan: a case report. European heart journal. Case reports 2022; 6:ytac091. http://www.ncbi.nlm.nih.gov/pubmed/?term=35261962
45. Wilke T, Weisser B, Predel HG *et al.* Effects of Single Pill Combinations Compared to Identical Multi Pill Therapy on Outcomes in Hypertension, Dyslipidemia and Secondary Cardiovascular Prevention: The START-Study. Integr Blood Press Control 2022; 15:11-21. http://www.ncbi.nlm.nih.gov/pubmed/?term=35250308
46. Hayashi T, Ai M, Goto S *et al.* Circadian Rhythm of Subspecies of Low-Density Lipoprotein-Cholesterol and High-Density Lipoprotein-Cholesterol in Healthy Subjects and Patients with Type 2 Diabetes. J Atheroscler Thromb 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35249932
47. Xu M, Tan W, Wang W *et al.* Minimally Invasive Surgery in Chronic Subdural Hematoma: Prognosis and Recurrence Factors of 516 Cases in a Single Center. Journal of clinical medicine 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35268412
48. Ghafoori M, Saadati H, Taghavi M *et al.* Survival of the hospitalized patients with COVID-19 receiving atorvastatin: A randomized clinical trial. Journal of medical virology 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35274326
49. Muse ED, Chen SF, Liu S *et al.* Impact of polygenic risk communication: an observational mobile application-based coronary artery disease study. NPJ Digit Med 2022; 5:30. http://www.ncbi.nlm.nih.gov/pubmed/?term=35277577
50. Ostwal V, Ramaswamy A, Gota V *et al.* Phase I Study Evaluating Dose De-escalation of Sorafenib with Metformin and Atorvastatin in Hepatocellular Carcinoma (SMASH). Oncologist 2022; 27:165-e222. http://www.ncbi.nlm.nih.gov/pubmed/?term=35274724
51. Meer E, Bavinger JC, Yu Y *et al.* Statin use and the risk of progression to vision threatening diabetic retinopathy. Pharmacoepidemiol Drug Saf 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35253307
52. Zhai X, Yi P, Wang X *et al.* Effect of statins on risk and mortality of urologic malignancies: Protocol of an umbrella review. PLoS One 2022; 17:e0264076. http://www.ncbi.nlm.nih.gov/pubmed/?term=35235590
53. Khan N, Kazmi Z. A Rare Case of Anti-HMGCR and Anti-SRP-Positive Immune-Mediated Necrotizing Myopathy. Qatar Med J 2022; 2022:6. http://www.ncbi.nlm.nih.gov/pubmed/?term=35261909

Basic Science

1. Abootorabi S, Akbari J, Saeedi M *et al.* Atorvastatin Entrapped Noisome (Atrosome): Green Preparation Approach for Wound Healing. AAPS PharmSciTech 2022; 23:81. http://www.ncbi.nlm.nih.gov/pubmed/?term=35266075
2. Sabapathy T, Helmerhorst E, Ellison G *et al.* High-fat diet induced alterations in plasma membrane cholesterol content impairs insulin receptor binding and signalling in mouse liver but is ameliorated by atorvastatin. Biochimica et biophysica acta. Molecular basis of disease 2022; 1868:166372. http://www.ncbi.nlm.nih.gov/pubmed/?term=35248691
3. Bae E, Yu MY, Moon JJ *et al.* Renoprotective Effect of KLF2 on Glomerular Endothelial Dysfunction in Hypertensive Nephropathy. Cells 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35269384
4. Liu S, Lin J, Ding R, Nie X. Simvastatin as an emerging pollutant on non-target aquatic invertebrates: effects on antioxidant-related genes in Daphnia magna. Environmental science and pollution research international 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35258724
5. David MA, Reiter AJ, Dunham CL *et al.* Pleiotropic Effects of Simvastatin and Losartan in Preclinical Models of Post-Traumatic Elbow Contracture. Front Bioeng Biotechnol 2022; 10:803403. http://www.ncbi.nlm.nih.gov/pubmed/?term=35265595

6. Martin WP, Chuah YHD, Abdelaal M *et al.* Medications Activating Tubular Fatty Acid Oxidation Enhance the Protective Effects of Roux-en-Y Gastric Bypass Surgery in a Rat Model of Early Diabetic Kidney Disease. Frontiers in endocrinology 2021; 12:757228. http://www.ncbi.nlm.nih.gov/pubmed/?term=35222262
7. Teixeira L, Temerozo JR, Pereira-Dutra FS *et al.* Simvastatin Downregulates the SARS-CoV-2-Induced Inflammatory Response and Impairs Viral Infection Through Disruption of Lipid Rafts. Frontiers in immunology 2022; 13:820131. http://www.ncbi.nlm.nih.gov/pubmed/?term=35251001
8. Peng J, Yang G, Huang Z. Vitamin D Deficiency Impacts Exposure and Response of Pravastatin in Male Rats by Altering Hepatic OATPs. Frontiers in pharmacology 2022; 13:841954. http://www.ncbi.nlm.nih.gov/pubmed/?term=35250587
9. Xiang J, Zhang H, Zhou X *et al.* Atorvastatin Restores PPARα Inhibition of Lipid Metabolism Disorders by Downregulating miR-21 Expression to Improve Mitochondrial Function and Alleviate Diabetic Nephropathy Progression. Frontiers in pharmacology 2022; 13:819787. http://www.ncbi.nlm.nih.gov/pubmed/?term=35222033
10. Zhang T, Ge J, Wei C. Atorvastatin Exerts Protective Effect on Cardiopulmonary Bypass Induced Renal Injury in Rats via PPAR-γ. The heart surgery forum 2022; 25:E124-e131. http://www.ncbi.nlm.nih.gov/pubmed/?term=35238313
11. Lin LP, Yu TY, Chang HN *et al.* Simvastatin Downregulates Cofilin and Stathmin to Inhibit Skeletal Muscle Cells Migration. Int J Mol Sci 2022; 23. http://www.ncbi.nlm.nih.gov/pubmed/?term=35269994
12. Nežić L, Amidžić L, Škrbić R *et al.* Amelioration of Endotoxin-Induced Acute Lung Injury and Alveolar Epithelial Cells Apoptosis by Simvastatin Is Associated with Up-Regulation of Survivin/NF-kB/p65 Pathway. Int J Mol Sci 2022; 23. http://www.ncbi.nlm.nih.gov/pubmed/?term=35269738
13. Mansouri A, Reiner Ž, Ruscica M *et al.* Antioxidant Effects of Statins by Modulating Nrf2 and Nrf2/HO-1 Signaling in Different Diseases. Journal of clinical medicine 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35268403
14. Mollace R, Macrì R, Tavernese A *et al.* Comparative Effect of Bergamot Polyphenolic Fraction and Red Yeast Rice Extract in Rats Fed a Hyperlipidemic Diet: Role of Antioxidant Properties and PCSK9 Expression. Nutrients 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35276836
15. Pereira E, Araujo BP, Rodrigues KL *et al.* Simvastatin Improves Microcirculatory Function in Nonalcoholic Fatty Liver Disease and Downregulates Oxidative and ALE-RAGE Stress. Nutrients 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35277075
16. Rajangam J, Krishnan N, Palei NN *et al.* Ameliorative Potential of Rosuvastatin on Doxorubicin-induced Cardiotoxicity by Modulating Oxidative Damage in Rats. Turk J Pharm Sci 2022; 19:28-34. http://www.ncbi.nlm.nih.gov/pubmed/?term=35227038

To subscribe to the Statin Literature Update Service Click HERE

mailing address:
lansberg@gmail.com