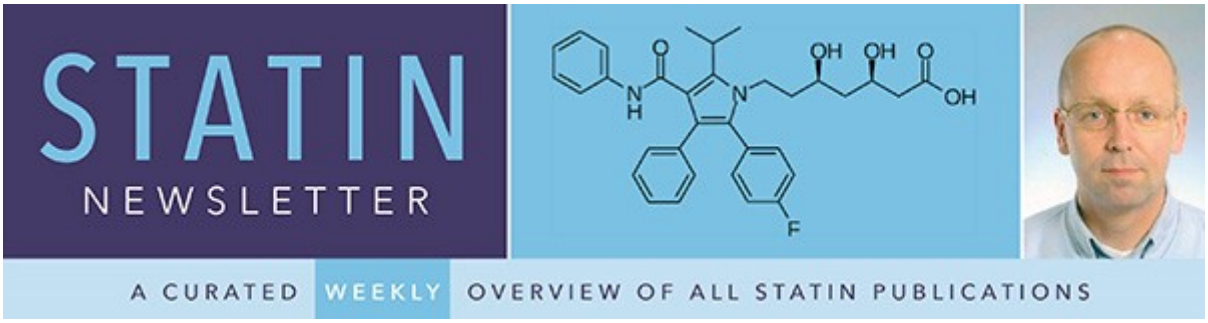

Update week 15 & 16 - 2022

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. **Lp(a) a residual risk in statin treated diabetic CVD pateints**
2. **Small dens LDL; why we should care**
3. **Lipid management in elderly patients - a review**
4. **Australian consensus on managing youg-adult type 2 diabetic patients**
5. **FH and diabetes - what do we know?**

Risk associated with elevated Lp(a) in statin treated diabetic CVD patients

The REASSURE-NIRS multi-center registry enrolled consecutive patients with CAD requiring percutaneous coronary intervention (PCI) under the guidance of near-infrared spectroscopy (NIRS)/intravascular ultrasound (IVUS) imaging. A total of 741 patients with CAD participated in this registry between 2015 – 2020. This sub-analysis aimed to determine elevated Lp(a) associated residual risk in diabetic and non-diabetic CVD patients. The endpoint was the scale of lipidic plaque materials in target lesions. At baseline high-intensity statin use (p = 0.49) and on-treatment low-density lipoprotein cholesterol (LDL-C) (p = 0.32) and Lp(a) levels (p = 0.09) were comparable in diabetics and non-diabetics. Lp(a) levels were significantly associated with maximum 4-mm lipid-core burden index (maxLCBI4mm) in patients with diabetes (p = 0.01) but not in patients without diabetes (p = 0.96). Multivariate analysis showed that LDL-C levels (p = 0.03) predict maxLCBI4mm in patients without diabetes, but not Lp(a) levels (p = 0.91). Both LDL-C (p = 0.01) and Lp(a) (p = 0.04) levels were independent predictors of maxLCBI4mm in patients with diabetes. Even in patients with diabetes achieving LDL-C <1.8 mmol/L (70 mg/dL), Lp(a) levels remained associated with maxLCBI4mm (p = 0.04). The authors pointed out that diabetic CVD patients with elevated Lp(a) showed were associated with vulnerable plaque features

notwithstanding statin therapy.
Nakamura H, Kataoka Y, Nicholls SJ *et al.* **Elevated Lipoprotein(a) as a potential residual risk factor associated with lipid-rich coronary atheroma in patients with type 2 diabetes and coronary artery disease on statin treatment: Insights from the REASSURE-NIRS registry.** Atherosclerosis 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35450750

Review on small dense LDL particle and CVD risk

With potent LDL-c lowering therapies currently available, the absolute CVD risk reduction remains not very impressive. Examples are the Jupiter Study, where 142 statin-treated patients (50% LDL- Reduction) experienced a primary endpoint vs. 251 patients in the placebo group. Comparable outcomes were noted in the FOURIER trial; 1344 patients using the combination of statin + evolocumab (mean LDL-c 30 mg/dL) experienced a primary event vs. 1563 occurrences in patients using only statins (LDL-c 92 mg/dL). Several metabolic markers have been proposed to explain this so-called residual risk. The differences in LDL particle size and composition have shown a significant relationship with ASCVD risk and atherosclerosis disease progression. An increase in the plasma levels of small dense LDL (sdLDL) particles is associated with elevated ASCVD risk even in patients with low LDL-c concentrations. An abundance of small, dense LDL particles is common in CHDs patients; approximately 30–40% of expressing an abundance of sdLDL. In this review, the authors summarize historical and recent clinical trial evidence related to the importance of small, dense LDL (sdLDL) in predicting CVD risk, treatment response, and clinical outcomes.
Superko H, Garrett B. **Small Dense LDL: Scientific Background, Clinical Relevance, and Recent Evidence Still a Risk Even with 'Normal' LDL-C Levels.** Biomedicines 2022; 10. http://www.ncbi.nlm.nih.gov/pubmed/?term=35453579

How to manage lipids in elderly patients - Review

Should elderly patients receive similar guideline dictated therapies, and should we aim for similar LDL-c goals as in younger adult individuals? This review presents a growing body of evidence on why elderly patients could benefit from intensive lipid management strategies. Whether to start or intensify pharmacological therapies in elderly patients deserves particular attention. Factors such as anticipated lifespan, comorbid conditions, physical and cognitive function, independence, polypharmacy, and personal preferences informing risk-benefit trade-offs are essential. Healthy lifestyle choices are considered the basis of CVD risk reduction; however, currently available statin and non-statin lipid-lowering medications can provide additional benefits. The authors review the available evidence on the broad portfolio of lipid-modifying interventions both in secondary and primary prevention settings for elderly patients.
Hassen LJ, Scarfone SR, Milks MW. **Lipid-Targeted Atherosclerotic Risk Reduction in Older Adults: A Review.** Geriatrics (Basel) 2022; 7. http://www.ncbi.nlm.nih.gov/pubmed/?term=35447841

Managing Type 2 Diabetes in young adult – Australian guidelines/consensus statement

The Australian Diabetes Society, together with the Australian Diabetes Educators Association and Australasian Paediatric Endocrine Group, have written the first-ever Australian consensus statement on the management of type 2 diabetes (DM2) in young adults. This consensus statement provides advice on screening, diabetes type, psychological care, lifestyle, glycaemic targets, pharmacological agents, cardiovascular disease risk management, comorbidity assessment, contraception and pregnancy planning, and patient-centered education. Type 2 diabetes that manifests in younger individuals appears to be a more aggressive condition than in older age groups. Earlier assessment and management of risk factors are advocated. Traditional cardiovascular risk calculators are unlikely to be accurate in this age group, and early statin use is recommended, aiming for an LDL-c target of <100 mg/dl. With the rapidly growing number of young adults developing DM2, this Australian consensus statement fills a gap. The need for more rigorous evidence is underlined and should trigger the development of appropriate registries, studies, and trials.

Wong J, Ross GP, Zoungas S *et al.* **Management of type 2 diabetes in young adults aged 18-30 years: ADS/ADEA/APEG consensus statement.** Med J Aust 2022; 216:422-429. http://www.ncbi.nlm.nih.gov/pubmed/?term=35430745

Do FH patients have a reduced risk for developing diabetes

Conflicting evidence on the causal relationship between familial hypercholesterolemia (FH) and the risk of developing diabetes mellitus type 2 (DM2) is confusing for healthcare professionals responsible for managing FH patients. In this elaborate review the authors dissect the current evidence on this observed mitigating effect of elevated cholesterol on the development of DM2. Several observational studies and registries show a reduced incidence of DM in FH families. In contrast the use of statins, that lower LDL-c, are associated with an increased risk of DM2. LDL-c putatively has a damaging effect of the insulin secreting pancreatic Beta-cells. Lifestyle factors that are playing an important role such as healthy diet and decreased body weight, are observed more frequently in FH patients and could be an explanation for these observations as well. Non-statin LDL-c lowering drugs are not prone for new onset diabetes and there are reports of FH families in whom DM2 is present. This review provides an interesting perspective on the different types of evidence put forward to support or refute the FH and DM 2 connection but points that there are knowledge gaps that need to be addressed to fully understand the interplay between glucose and lipid metabolism.

González-Lleó AM, Sánchez-Hernández RM, Boronat M, Wägner AM. **Diabetes and Familial Hypercholesterolemia: Interplay between Lipid and Glucose Metabolism**. Nutrients 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35406116

Relevant Publications

1. Escudero-Martínez I, Matusevicius M, Pavia-Nunes A *et al.* Association of statin pre-treatment with baseline stroke severity and outcome in patients with acute ischemic stroke and received reperfusion treatment: An observational study. Int J Stroke 2022:17474930221095965. http://www.ncbi.nlm.nih.gov/pubmed/?term=35403505
2. van de Borne P, Peeters A, Janssens L *et al.* Lipid-lowering therapy and risk-based LDL-C goal attainment in Belgium: DA VINCI observational study. Acta Cardiol 2022:1-10. http://www.ncbi.nlm.nih.gov/pubmed/?term=35442151
3. Mozaffarian S, Taherpour N, Sistanizad M *et al.* Short- and Long-term Myocardial Infarction Survival Rate According to the Type of Drugs Prescribed at the Time of Discharge: A Study Using Iran National Registry Data. Archives of Iranian medicine 2022; 25:105-111. http://www.ncbi.nlm.nih.gov/pubmed/?term=35429947
4. Kuriya B, Akhtari S, Movahedi M *et al.* Statin Use for Primary Cardiovascular Disease Prevention is Low in Inflammatory Arthritis. Can J Cardiol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35429590
5. Natsui H, Konishi T, Saiin K *et al.* Vulnerable plaque derived from aspirated thrombi in recurrent acute coronary syndrome with familial hypercholesterolemia despite intensive lipid-lowering statin therapy. Cardiology journal 2022; 29:362-363. http://www.ncbi.nlm.nih.gov/pubmed/?term=35411933
6. Hong JH, Jeon U, Shin WY *et al.* A Paradigm Shift in Dyslipidemia Management in Primary Care: A 12-Month Cohort Study. Clinical therapeutics 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35410755
7. Qasim M, Bahadur A, Khan SU *et al.* The Efficacy of Fenofibrate in Addition to Atorvastatin in Patients of Type II Diabetes Mellitus. Cureus 2022; 14:e22852. http://www.ncbi.nlm.nih.gov/pubmed/?term=35399402
8. Abushanab D, Al-Badriyeh D, Marquina C *et al.* A Systematic Review of Cost-Effectiveness of Non-Statin Lipid-Lowering Drugs for Primary and Secondary

Prevention of Cardiovascular Disease in Patients with Type 2 Diabetes Mellitus. Curr Probl Cardiol 2022:101211. http://www.ncbi.nlm.nih.gov/pubmed/?term=35460688
9. Messiha D, Petrikhovich O, Lortz J *et al.* Gender Differences in Outpatient Peripheral Artery Disease Management in Germany: A Population Based Study 2009-2018. European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35450775
10. Bi L, Yi J, Wu C *et al.* Atherosclerotic Cardiovascular Disease Risk and Lipid-Lowering Therapy Requirement in China. Frontiers in cardiovascular medicine 2022; 9:839571. http://www.ncbi.nlm.nih.gov/pubmed/?term=35419429
11. Gratton J, Finan C, Hingorani AD *et al.* LDL-C Concentrations and the 12-SNP LDL-C Score for Polygenic Hypercholesterolaemia in Self-Reported South Asian, Black and Caribbean Participants of the UK Biobank. Frontiers in genetics 2022; 13:845498. http://www.ncbi.nlm.nih.gov/pubmed/?term=35432461
12. Huang YT, Ho LT, Hsu HY *et al.* Efficacy and Safety of Proprotein Convertase Subtilisin/Kexin Type 9 Inhibitors as Adjuvant Treatments for Patients with Hypercholesterolemia Treated with Statin: A Systematic Review and Network Meta-analysis. Frontiers in pharmacology 2022; 13:832614. http://www.ncbi.nlm.nih.gov/pubmed/?term=35444537
13. Yu W, Chen W, Jiang Y *et al.* Effectiveness Comparisons of Drug Therapy on Chronic Subdural Hematoma Recurrence: A Bayesian Network Meta-Analysis and Systematic Review. Frontiers in pharmacology 2022; 13:845386. http://www.ncbi.nlm.nih.gov/pubmed/?term=35401183
14. Stürzebecher PE, Schumann F, Kassner U, Laufs U. [Statin intolerance and statin-associated muscular pain]. Herz 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35451596
15. Yanai H, Adachi H, Hakoshima M, Katsuyama H. Molecular Biological and Clinical Understanding of the Statin Residual Cardiovascular Disease Risk and Peroxisome Proliferator-Activated Receptor Alpha Agonists and Ezetimibe for Its Treatment. Int J Mol Sci 2022; 23. http://www.ncbi.nlm.nih.gov/pubmed/?term=35408799
16. Ramírez-Morros A, Franch-Nadal J, Real J *et al.* Sex Differences in Cardiovascular Prevention in Type 2: Diabetes in a Real-World Practice Database. Journal of clinical medicine 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35456292
17. Nicholls SJ, Kataoka Y, Nissen SE *et al.* Effect of Evolocumab on Coronary Plaque Phenotype and Burden in Statin-Treated Patients Following Myocardial Infarction. JACC. Cardiovascular imaging 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35431172
18. Mundal LJ, Igland J, Svendsen K *et al.* Association of Familial Hypercholesterolemia and Statin Use With Risk of Dementia in Norway. JAMA network open 2022; 5:e227715. http://www.ncbi.nlm.nih.gov/pubmed/?term=35438756
19. Li ZZ, Du X, Liu N *et al.* Impact of Low-density Lipoprotein Cholesterol Levels on Outcomes in Nonvalvular Atrial Fibrillation: Results from the China Atrial Fibrillation Registry Study. Medical science monitor : international medical journal of experimental and clinical research 2022; 28:e934747. http://www.ncbi.nlm.nih.gov/pubmed/?term=35418552
20. Zhang X, Liu Q, Zhang H *et al.* Hyperlipidemia patients carrying LDLR splicing mutation c.1187-2A>G respond favorably to rosuvastatin and PCSK9 inhibitor evolocumab. Mol Genet Genomics 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35441343
21. Al-Sabti H, Al-Hinai AT, Al-Zakwani I *et al.* The Achievement of Non-high-density Lipoprotein Cholesterol Target in Patients with Very High Atherosclerotic Cardiovascular Disease Risk Stratified by Triglyceride Levels Despite Statin-controlled Low-density Lipoprotein Cholesterol. Oman medical journal 2022; 37:e367. http://www.ncbi.nlm.nih.gov/pubmed/?term=35449790
22. Bots SH, Onland-Moret NC, Jancev M *et al.* Statins are associated with a large reduction in all-cause mortality in women from a cardiac outpatient population. Open heart 2022; 9. http://www.ncbi.nlm.nih.gov/pubmed/?term=35444049

23. Gynnild MN, Hageman SHJ, Spigset O *et al.* Use of lipid-lowering therapy after ischaemic stroke and expected benefit from intensification of treatment. Open heart 2022; 9. http://www.ncbi.nlm.nih.gov/pubmed/?term=35459718
24. Mammen AL. Statin-Associated Myalgias and Muscle Injury-Recognizing and Managing Both While Still Lowering the Low-Density Lipoprotein. Rheum Dis Clin North Am 2022; 48:445-454. http://www.ncbi.nlm.nih.gov/pubmed/?term=35400370
25. Zuurbier SM, Hickman CR, Rinkel LA *et al.* Association Between Beta-Blocker or Statin Drug Use and the Risk of Hemorrhage From Cerebral Cavernous Malformations. Stroke 2022:101161strokeaha121037009. http://www.ncbi.nlm.nih.gov/pubmed/?term=35410492
26. Rosolová H. Advances of the contemporary treatment of hypertension and hypercholesterolemia by a new fixed combination. Vnitr Lek 2022; 68:64-67. http://www.ncbi.nlm.nih.gov/pubmed/?term=35459349
27. Chow R, Lee J, Noh H *et al.* The association between statin and COVID-19 adverse outcomes: national COVID-19 cohort in South Korea. Ann Palliat Med 2022; 11:1297-1307. http://www.ncbi.nlm.nih.gov/pubmed/?term=35400159
28. Chow R, Simone CB, 2nd, Prsic EH, Shin HJ. Cost-effectiveness analysis of statins for the treatment of hospitalized COVID-19 patients. Ann Palliat Med 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35400155
29. Sharma S, Dayal S, Aggarwal K *et al.* Scrutinising the role of simvastatin in a patient of Pachyonychia Congenita with KRT6A gene mutation. Australas J Dermatol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35429339
30. Toscano A, Cinquegrani M, Scuruchi M *et al.* PCSK9 Plasma Levels Are Associated with Mechanical Vascular Impairment in Familial Hypercholesterolemia Subjects without a History of Atherosclerotic Cardiovascular Disease: Results of Six-Month Add-On PCSK9 Inhibitor Therapy. Biomolecules 2022; 12. http://www.ncbi.nlm.nih.gov/pubmed/?term=35454151
31. Wang W, Lu X, Li C *et al.* Rhabdomyolysis induced by rosuvastatin combined with entecavir: a case report. BMC infectious diseases 2022; 22:365. http://www.ncbi.nlm.nih.gov/pubmed/?term=35410138
32. Halámková J, Bohovicová L, Pehalová L *et al.* Use of Hypolipidemic Drugs and the Risk of Second Primary Malignancy in Colorectal Cancer Patients. Cancers 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35406471
33. Amadi PU, Agomuo EN, Amadi JA *et al.* Efficacy of using walnuts as statin adjuvants in hypertension management. Clinical and experimental hypertension (New York, N.Y. : 1993) 2022:1-8. http://www.ncbi.nlm.nih.gov/pubmed/?term=35435086
34. Liu L, Tessier S, Ido F *et al.* Anti-3-Hydroxy-3-Methylglutaryl Coenzyme A Reductase (Anti-HMG CoA) Myopathy With Cardiac Involvement: Presentation, Diagnosis, and Management. Cureus 2022; 14:e23125. http://www.ncbi.nlm.nih.gov/pubmed/?term=35425681
35. Wing RR, Neiberg RH, Bahnson JL *et al.* Weight Change During the Postintervention Follow-up of Look AHEAD. Diabetes Care 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35421225
36. 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 [Response to Letter]. Diabetes, metabolic syndrome and obesity : targets and therapy 2022; 15:1111-1112. http://www.ncbi.nlm.nih.gov/pubmed/?term=35437347
37. Zihlif M, Otoum S, Al Shhab M *et al.* No association between LDL receptor and CETP genetic variants and atorvastatin response in Jordanian hyperlipidemic patients. Drug Metab Pers Ther 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35447021
38. Yuan Y, Xiong R, Wu Y *et al.* Associations of statin use with the onset and progression of open-angle glaucoma: A systematic review and meta-analysis. EClinicalMedicine 2022; 46:101364. http://www.ncbi.nlm.nih.gov/pubmed/?term=35399812
39. Vu M, Kettunen R, Tolppanen AM *et al.* Statin discontinuation in persons with and without Alzheimer's disease. Eur J Clin Pharmacol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35449421

40. Sonaglioni A, Cerini F, Nicolosi GL *et al.* Left ventricular strain predicts subclinical atherosclerosis in nonadvanced nonalcoholic fatty liver disease patients. European journal of gastroenterology & hepatology 2022; 34:707-716. http://www.ncbi.nlm.nih.gov/pubmed/?term=35412487
41. Kim JH, Choi HG, Kwon MJ *et al.* The Influence of Prior Statin Use on the Prevalence and Exacerbation of Chronic Obstructive Pulmonary Disease in an Adult Population. Frontiers in medicine 2022; 9:842948. http://www.ncbi.nlm.nih.gov/pubmed/?term=35402450
42. Sim Y, Lim C, Phyu N *et al.* The Impact of Statin Use and Breast Cancer Recurrence - A Retrospective Study in Singapore. Frontiers in oncology 2022; 12:835320. http://www.ncbi.nlm.nih.gov/pubmed/?term=35433431
43. Passarelli MN, McDonald JG, Thompson BM *et al.* Association of demographic and health characteristics with circulating oxysterol concentrations. J Clin Lipidol 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35461764
44. Choi HG, Kwon BC, Kwon MJ *et al.* Association between Gout and Dyslipidemia: A Nested Case-Control Study Using a National Health Screening Cohort. Journal of personalized medicine 2022; 12. http://www.ncbi.nlm.nih.gov/pubmed/?term=35455721
45. Kwon MJ, Kim JH, Kim JH *et al.* Incident Rheumatoid Arthritis Following Statin Use: From the View of a National Cohort Study in Korea. Journal of personalized medicine 2022; 12. http://www.ncbi.nlm.nih.gov/pubmed/?term=35455675
46. Sperry MM, Oskotsky T, MariÄ I *et al.* Different HMGCR-inhibiting statins vary in their association with increased survival in patients with COVID-19. medRxiv 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35441166
47. Cai C, Love BL, Yunusa I, Reeder CE. Applying mixture cure survival modeling to medication persistence analysis. Pharmacoepidemiol Drug Saf 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35426193
48. Weiner J, Lui G, Brown M *et al.* Protocol for the pilot randomized trial of the CArdiovascular Risk assEssment for Rheumatoid Arthritis (CARE RA) intervention: a peer coach behavioral intervention. Pilot Feasibility Stud 2022; 8:84. http://www.ncbi.nlm.nih.gov/pubmed/?term=35428359
49. Fung KW, Baik SH, Baye F *et al.* Effect of common maintenance drugs on the risk and severity of COVID-19 in elderly patients. PLoS One 2022; 17:e0266922. http://www.ncbi.nlm.nih.gov/pubmed/?term=35436293
50. Korthauer LE, Giugliano RP, Guo J *et al.* No association between APOE genotype and lipid lowering with cognitive function in a randomized controlled trial of evolocumab. PLoS One 2022; 17:e0266615. http://www.ncbi.nlm.nih.gov/pubmed/?term=35404972
51. Vavlukis A, Vavlukis M, Mladenovska K *et al.* Antioxidative Effects of Rosuvastatin in Low-to-Moderate Cardiovascular Risk Subjects. Pril (Makedon Akad Nauk Umet Odd Med Nauki) 2022; 43:65-75. http://www.ncbi.nlm.nih.gov/pubmed/?term=35451294

Basic Science

1. Suram D, Veerabrahma K. Design and Development of Solid SMEDDS and Liquisolid Formulations of Lovastatin, for Improved Drug Dissolution and In vivo Effects-a Pharmacokinetic and Pharmacodynamic Assessment. AAPS PharmSciTech 2022; 23:123. http://www.ncbi.nlm.nih.gov/pubmed/?term=35460060
2. Sheng N, Wang YQ, Wang CF *et al.* AGR2-induced cholesterol synthesis drives lovastatin resistance that is overcome by combination therapy with allicin. Acta pharmacologica Sinica 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35459869
3. Wang J, Zhao J, Yan C *et al.* Identification and evaluation of a lipid-lowering small compound in preclinical models and in a Phase I trial. Cell Metab 2022; 34:667-680.e666. http://www.ncbi.nlm.nih.gov/pubmed/?term=35427476

4. Shao WQ, Zhu WW, Luo MJ *et al.* Cholesterol suppresses GOLM1-dependent selective autophagy of RTKs in hepatocellular carcinoma. Cell Rep 2022; 39:110712. http://www.ncbi.nlm.nih.gov/pubmed/?term=35443161
5. La Mura V, Gagliano N, Arnaboldi F *et al.* Simvastatin Prevents Liver Microthrombosis and Sepsis Induced Coagulopathy in a Rat Model of Endotoxemia. Cells 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35406712
6. Niedbalska-Tarnowska J, Ochenkowska K, Migocka-Patrzałek M, Dubińska-Magiera M. Assessment of the Preventive Effect of L-carnitine on Post-statin Muscle Damage in a Zebrafish Model. Cells 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35455976
7. Huang X, Gao H, Zhang W *et al.* Regulating the Size of Simvastatin-loaded Discoidal Reconstituted High-density Lipoprotein: Preparation, Characterization and Investigation of Cellular Cholesterol Efflux. Current drug delivery 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35430991
8. He J, Zhou X, Xu F *et al.* Anchoring β-CD on simvastatin-loaded rHDL for selective cholesterol crystals dissolution and enhanced anti-inflammatory effects in macrophage/foam cells. European journal of pharmaceutics and biopharmaceutics : official journal of Arbeitsgemeinschaft fur Pharmazeutische Verfahrenstechnik e.V 2022; 174:144-154. http://www.ncbi.nlm.nih.gov/pubmed/?term=35447349
9. Li H, Gou Y, Tian F *et al.* The combined anti-osteoporotic effects of simvastatin and exercise in ovariectomized mice fed a high-fat diet. Experimental gerontology 2022; 164:111794. http://www.ncbi.nlm.nih.gov/pubmed/?term=35421557
10. Adeyanju MM, Saheed IA, Oyelekan OI *et al.* Sesamum indicum diet prevents hyperlipidemia in experimental rats. Food Chem (Oxf) 2022; 4:100092. http://www.ncbi.nlm.nih.gov/pubmed/?term=35415692
11. Mirzaeinia S, Zeinali S, Budisa N, Karbalaei-Heidari HR. Targeted Codelivery of Prodigiosin and Simvastatin Using Smart BioMOF: Functionalization by Recombinant Anti-VEGFR1 scFv. Front Bioeng Biotechnol 2022; 10:866275. http://www.ncbi.nlm.nih.gov/pubmed/?term=35402395
12. Zeng W, Hu M, Lee HK *et al.* Effect of Green Tea Extract and Soy Isoflavones on the Pharmacokinetics of Rosuvastatin in Healthy Volunteers. Front Nutr 2022; 9:850318. http://www.ncbi.nlm.nih.gov/pubmed/?term=35399656
13. Negrea G, Rauca VF, Meszaros MS *et al.* Active Tumor-Targeting Nano-formulations Containing Simvastatin and Doxorubicin Inhibit Melanoma Growth and Angiogenesis. Frontiers in pharmacology 2022; 13:870347. http://www.ncbi.nlm.nih.gov/pubmed/?term=35450036
14. Etemadi S, Abtahi Froushani SM, Hashemi Asl SM, Mahmoudian A. Combined atorvastatin and pentoxifylline in ameliorating inflammation induced by complete Freund's adjuvant. Inflammopharmacology 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35428948
15. Song XY, Chen YY, Liu WT *et al.* Atorvastatin reduces IOP in ocular hypertension in vivo and suppresses ECM in trabecular meshwork perhaps via FGD4. International journal of molecular medicine 2022; 49. http://www.ncbi.nlm.nih.gov/pubmed/?term=35417030
16. Ruga S, Galla R, Penna C *et al.* The Activity of Ten Natural Extracts Combined in a Unique Blend to Maintain Cholesterol Homeostasis-In Vitro Model. Int J Mol Sci 2022; 23. http://www.ncbi.nlm.nih.gov/pubmed/?term=35409162
17. Yildirim M, Kayalar O, Atahan E, Oztay F. Atorvastatin attenuates pulmonary fibrosis in mice and human lung fibroblasts, by the regulation of myofibroblast differentiation and apoptosis. Journal of biochemical and molecular toxicology 2022:e23074. http://www.ncbi.nlm.nih.gov/pubmed/?term=35416377
18. Guo X, Zhou S, Yang Z *et al.* Cholesterol metabolism and its implication in glioblastoma therapy. Journal of Cancer 2022; 13:1745-1757. http://www.ncbi.nlm.nih.gov/pubmed/?term=35399707
19. Prajapati P, Patel A, Shah S. Simultaneous Estimation of Telmisartan, Chlorthalidone, Amlodipine Besylate and Atorvastatin by RP-HPLC Method for Synchronous Assay of Multiple FDC Products Using Analytical FMCEA-Based AQbD Approach. Journal of

chromatographic science 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35446938
20. Dehghankelishadi P, Maritz MF, Dmochowska N *et al.* Formulation of simvastatin within high density lipoprotein enables potent tumour radiosensitisation. J Control Release 2022; 346:98-109. http://www.ncbi.nlm.nih.gov/pubmed/?term=35447296
21. Guo C, Wan R, He Y *et al.* Therapeutic targeting of the mevalonate-geranylgeranyl diphosphate pathway with statins overcomes chemotherapy resistance in small cell lung cancer. Nat Cancer 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35449308
22. Zafar H, Ain NU, Alshammari A *et al.* Lacticaseibacillus rhamnosus FM9 and Limosilactobacillus fermentum Y57 Are as Effective as Statins at Improving Blood Lipid Profile in High Cholesterol, High-Fat Diet Model in Male Wistar Rats. Nutrients 2022; 14. http://www.ncbi.nlm.nih.gov/pubmed/?term=35458216
23. Antunes KA, Monteiro-Alfredo T, Cunha JSM *et al.* Spondias purpurea L. Bark Extract Protects against Oxidative Stress and Reduces Hypercholesterolemia in Mice Fed High-Fat Diet. Oxidative medicine and cellular longevity 2022; 2022:3046483. http://www.ncbi.nlm.nih.gov/pubmed/?term=35401919
24. Kang X, Huang T, Shen H *et al.* Salmonella Enteritidis Subunit Vaccine Candidate Based on SseB Protein Co-Delivered with Simvastatin as Adjuvant. Pathogens (Basel, Switzerland) 2022; 11. http://www.ncbi.nlm.nih.gov/pubmed/?term=35456118
25. Inam S, Irfan M, Lali NUA *et al.* Development and Characterization of Eudragit(®) EPO-Based Solid Dispersion of Rosuvastatin Calcium to Foresee the Impact on Solubility, Dissolution and Antihyperlipidemic Activity. Pharmaceuticals (Basel, Switzerland) 2022; 15. http://www.ncbi.nlm.nih.gov/pubmed/?term=35455489
26. Ghosh D, Ghosh Dastidar D, Roy K *et al.* Computational prediction of the molecular mechanism of statin group of drugs against SARS-CoV-2 pathogenesis. Scientific reports 2022; 12:6241. http://www.ncbi.nlm.nih.gov/pubmed/?term=35422113
27. Zierfuss B, Höbaus C, Herz CT *et al.* HDL particle subclasses in statin treated patients with peripheral artery disease predict long-term survival. Thrombosis and haemostasis 2022. http://www.ncbi.nlm.nih.gov/pubmed/?term=35436798

To subscribe to the Statin Literature Update Service Click HERE

Facebook Twitter Website

mailing address:
lansberg@gmail.com