

## AGE Reader Key Publications

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- **Skin autofluorescence predicts incident type 2 diabetes, cardiovascular disease and mortality in the general population.** van Waateringe R et al. Diabetologia. 2019 Feb;62(2):269-280 Epub
- **Skin Autofluorescence-Indicated Advanced Glycation End Products as Predictors of Cardiovascular and All-Cause Mortality in High-Risk Subjects: A Systematic Review and Meta-analysis.** Caverro-Redondo I. et al. J Am Heart Assoc. 2018 Sep 18;7(18)
- **Skin autofluorescence provides additional information to the UK Prospective Diabetes Study (UKPDS) risk score for the estimation of cardiovascular prognosis in type 2 diabetes mellitus.** Lutgers H. et al, Diabetologia, 2009; 52(5): 789-797
- **Skin autofluorescence and risk of micro- and macrovascular complications in patients with Type 2 diabetes mellitus-a multi-centre study.** Noordzij M.J. et al. Diabet Med. 2012 Dec;29(12):1556-61.
- **Skin Autofluorescence and the Association with Renal and Cardiovascular Risk Factors in Chronic Kidney Disease Stage 3.** McIntyre N. et al. Clin J Am Soc Nephrol. 2011 Sep 1. Epub
- **Skin Autofluorescence: A tool to identify type 2 diabetic patients at risk for developing microvascular disease.** Gerrits E. et al. Diabetes Care. 2008; 31: 517-521
- **Messung der Autofluoreszenz der Haut.** Stirban A. and Heinemann L. Diabetes Stoffw Herz. 2013; 22
- **Skin Autofluorescence Is Associated With 5-Year Mortality and Cardiovascular Events in Patients With Peripheral Artery Disease.** de Vos LC. et al. Arterioscler Thromb Vasc Biol. 2014 Feb 13.
- **Simple non-invasive assessment of advanced glycation endproducts accumulation.** Meerwaldt R et al, Diabetologia, 2004; 47:1324-1330

## AGE Reader in diabetes

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1. **AGE and diabetic vascular complications in type 2 diabetes**  
Osawa S. J of Diabetes and its Complications 2018 Sept: 839-844
2. **Gradual increase in advanced glycation end-products from no diabetes to early and regular gestational diabetes: A case-control study.**  
Cosson E. Diabetes and Metabolism 2018 Febr 2 Epub
3. **Skin Autofluorescence is a Noninvasive Surrogate Marker for Diabetic Microvascular Complications and Carotid Intima-Media Thickness in Japanese Patients with Type 2 Diabetes: A Cross-sectional Study.** Yoshioka K. Diabetes Ther. 2017 Nov 24. doi: 10.1007/s13300-017-0339-3.
4. **Fokkens B.T. et al. Skin autofluorescence improves the Finnish Diabetes Risk Score in the detection of diabetes in a large population-based cohort: The Lifelines Cohort Study.**

Fokkens B. et al. *Diabetes Metab.* 2017 Oct 30. pii: S1262-3636(17)30513-X. doi: 10.1016/j.diabet.2017.09.002.

5. **Ethnicity and skin autofluorescence-based risk-engines for cardiovascular disease and diabetes mellitus.** Ahmad M.S. et al. *PLoS One.* 2017 Sep 20;12(9):e0185175.
6. **Progression of skin autofluorescence of AGEs over 4 years in patients with type 1 diabetes.** Rajaobelina K et al. *Diabetes Metab Res Rev.* 2017 Jul 18. doi: 10.1002/dmrr.2917.
7. **The relationship between circulating irisin levels and tissues AGE accumulation in type 2 diabetes patients.** Li Z. et al. *Biosci Rep.* 2017 Apr 13. doi: 10.1042/BSR20170213.
8. **Vitreous advanced glycation endproducts and  $\alpha$ -dicarbonyls in retinal detachment patients with type 2 diabetes mellitus and non-diabetic controls.** Fokkens B.T. et al. *PLoS One.* 2017 Mar 6;12(3):e0173379. doi: 10.1371/journal.pone.0173379.
9. **Skin autofluorescence, renal insufficiency and retinopathy in patients with type 2 diabetes.** Bentata R. et al. *J Diabetes Complications.* 2016 Oct 30. [Epub ahead of print]
10. **Association between small fiber neuropathy and higher skin accumulation of advanced glycation end products in patients with type 1 diabetes.** Araszkiwicz A, et al. *Pol Arch Med Wewn.* 2016 Nov 22;126(11):847-853.
11. **Risk factors for autonomic and somatic nerve dysfunction in different stages of glucose tolerance.** Dimova R, et al. *J Diabetes Complications.* 2016 Nov 6. [Epub ahead of print]
12. **Skin autofluorescence (a marker for advanced glycation end products) and erectile dysfunction in diabetes.** Kouidrat Y. et al. *J Diabetes Complications.* 2016 Oct 29. pii: S1056-8727(16)30351-8. [Epub ahead of print]
13. **Skin autofluorescence is increased in young people with type 1 diabetes exposed to secondhand smoking.** Vollenbrock CE. et al. *J Diabetes.* 2016 Oct 27. (Epub).
14. **Higher skin autofluorescence in young people with Type 1 diabetes and microvascular complications.** Cho YH. et al. *Diabet Med.* 2016 Oct 22. (Epub)
15. **Advanced glycation end products is a risk for muscle weakness in Japanese patients with type 1 diabetes.** Mori H. et al. *J Diabetes Investig.* 2016 Oct 11. (Epub) (FULL TEXT available)
16. **Skin Autofluorescence is Associated with Early-stage Atherosclerosis in Patients with Type 1 Diabetes.** Osawa S et al. *J Atheroscler Thromb.* 2016 Sep 2.
17. **Skin autofluorescence predicts cardio-renal outcome in type 1 diabetes: a longitudinal study.** Vélayoudom-Céphise FL et al. *Cardiovasc Diabetol.* 2016 Sep 1;15(1):127.
18. **Skin Autofluorescence and Pentosidine Are Associated With Aortic Stiffening: The Maastricht Study.** van Eupen MG et al. *Hypertension.* 2016 Oct;68(4):956-63.
19. **Skin fluorescence as a clinical tool for non-invasive assessment of advanced glycation and long-term complications of diabetes.** Fokkens BT, Smit AJ. *Glycoconj J.* 2016 Aug;33(4):527-35.

- 20. ADVANCED GLYCATION END PRODUCT (AGE) ACCUMULATION IN THE SKIN IS ASSOCIATED WITH DEPRESSION: THE MAASTRICHT STUDY.**  
van Dooren FE et al. *Depress Anxiety*. 2016 Jun 6. (Epub)
- 21. Skin autofluorescence and peripheral neuropathy four years later in type 1 diabetes.**  
Rajaobelina K. et al. *Diabetes Metab Res Rev*. 2016 May 27. Epub
- 22. The relationship between advanced glycation endproducts and ocular circulation in type 2 diabetes.** Hashimoto K. et al. *J Diabetes Complications* 2016 May 4. Epub.
- 23. Advanced Glycation Endproducts and Bone Material Strength in Type 2 Diabetes.**  
Furst J.R. et al. *J Clin Endocrinol Metab*. 2016 Apr 26. Epub.
- 24. Association of Advanced Glycation End Products with coronary Artery Calcification in Japanese Subjects with Type 2 Diabetes as Assessed by Skin Autofluorescence.**  
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- 25. Non-invasive Measurement of Skin Autofluorescence as a Beneficial Surrogate Marker for Atherosclerosis in Patients with Type 2 Diabetes.**  
Temma J. et al. *J Med Invest*. 2015;62(3-4):126-9.
- 26. Advanced glycation end products, measured in skin, vs. HbA1c in children with type 1 diabetes mellitus.** Banser A. et al. *Pediatr Diabetes*. 2015 Sep 2.
- 27. Relationship between skin auto fluorescence and conventional glycemic markers in patients with diabetes.**  
Mácsai E. et al. *Orv Hetil*. 2015 Aug 16;156(33):1341-7.
- 28. In diabetic Charcot neuroarthropathy impaired microvascular function is related to long lasting metabolic control and low grade inflammatory process.**  
Araszkievicz A. et al. *Microvasc Res*. 2015 Aug 1;101:143-147.
- 29. Vitamin D status is associated with skin autofluorescence in patients with type 2 diabetes mellitus: a preliminary report.**  
Krul-Poel Y.H. et al. *Cardiovasc Diabetol*. 2015 Jul 16;14:89.
- 30. Is skin autofluorescence a marker of metabolic memory in pregnant women with diabetes?**  
Maury E. et al. *Diabet Med*. 2015 May 16.
- 31. The Association Between Skin Autofluorescence and Vascular Complications in Chinese Patients With Diabetic Foot Ulcer: An Observational Study Done in Shanghai.**  
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- 32. Autofluorescence of Skin Advanced Glycation End Products: Marker of Metabolic Memory in Elderly Population.**  
Rajaobelina K. et al. *J Gerontol A Biol Sci Med Sci*. 2015 Jan 14 (Epub)
- 33. Skin autofluorescence is associated with carotid intima-media thickness, diabetic microangiopathy, and long-lasting metabolic control in type 1 diabetic patients. Results from Poznan Prospective Study.** Araszkievicz A. et al. *Microvasc Res*. 2015 Jan 10 (Epub)
- 34. Association of advanced glycation end products and chronic kidney disease with macroangiopathy in type 2 diabetes.**  
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- 35. Advanced glycation end products (AGEs) and the soluble receptor for AGE (sRAGE) in patients with type 1 diabetes and coeliac disease.**  
Bakker S.F. et al. Nutr Metab Cardiovasc Dis. 2014 Nov 1. Epub
- 36. Associations of advanced glycation endproducts with cognitive functions in individuals with and without type 2 diabetes.**  
Spauwen P.J. et al. J Clin Endocrinol Metab. 2014 Dec 2
- 37. Relationship of Skin Autofluorescence to Severity of Retinopathy in Type 2 Diabetes.**  
Yasuda M. et al. Curr Eye Res. 2014 May 28:1-8.
- 38. Type 2 diabetes mellitus, skin autofluorescence and brain atrophy.**  
Moran C. et al. Diabetes. 2014 Jul 22.
- 39. AGEs and chronic subclinical inflammation in diabetes: disorders of immune system.**  
Hu H. et al. Diabetes Metab Res Rev. 2014 May 20. Epub
- 40. Correlation between diabetic macular severity and elevated skin autofluorescence as a marker of advanced glycation end-product accumulation in type 2 diabetic patients.**  
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- 41. Advanced glycation end products are associated with arterial stiffness in type 1 diabetes.**  
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- 42. Messung der Autofluoreszenz der Haut.**  
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- 43. Skin autofluorescence relates to soluble receptor for advanced glycation end-products and albuminuria in diabetes mellitus.**  
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- 44. Skin autofluorescence based decision tree in detection of impaired glucose tolerance and diabetes.**  
Smit AJ. et al. PLoS One. 2013 Jun 4;8(6):e65592.
- 45. Potential inhibitory effects of L-carnitine supplementation on tissue advanced glycation end products in patients with hemodialysis.**  
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- 46. Skin autofluorescence relates to soluble receptor for advanced glycation end-products and albuminuria in diabetes mellitus.**  
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- 47. Skin autofluorescence is associated with past glycaemic control and complications in type 1 diabetes mellitus.**  
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- 48. Advanced Glycation End Products Assessed by Skin Autofluorescence-A New Marker of Diabetic Foot Ulceration.**  
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- 49. Study design of DIACORE (DIAbetes COHoRtE) - a cohort study of patients with diabetes mellitus type 2.** Dörhöfer L, BMC Med Genet. 2013 Feb 14;14:25.
- 50. Verification of Skin Autofluorescence Values by Mass Spectrometry in Adolescents with Type 1 Diabetes: Brief Report.**  
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- 51. Advanced glycation end products in infant formulas do not contribute to insulin resistance associated with their consumption.**  
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- 52. Advanced Glycation End Products, Measured as Skin Autofluorescence, During Normal Pregnancy and Pregnancy Complicated by Diabetes Mellitus.**  
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- 53. Skin autofluorescence measurement in diabetological and nephrological clinical practice.**  
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- 54. Skin autofluorescence and risk of micro- and macrovascular complications in patients with Type 2 diabetes mellitus-a multi-centre study.**  
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- 55. Advanced glycation end products measured by skin autofluorescence in a population with central obesity.**  
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- 57. Advanced Glycation Endproducts and Diabetic Cardiovascular Disease.**  
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- 58. Non-invasive measures of tissue autofluorescence are increased in Type 1 diabetes complications and correlate with a non-invasive measure of vascular dysfunction.**  
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- 59. Skin autofluorescence is associated with severity of vascular complications in Japanese patients with Type 2 diabetes.** Tanaka K. et al. Diabet Med. 2011 Sep 14. Epub
- 60. Skin autofluorescence is inversely related to HDL anti-oxidative capacity in type 2 diabetes mellitus.**  
Mulder D. et al. Atherosclerosis. 2011 May, Epub
- 61. Advanced Glycation End Products, Measured as Skin Autofluorescence, at Diagnosis in Gestational Diabetes Mellitus Compared with Normal Pregnancy.**  
de Ranitz-Greven WL et al. Diabetes Technol Ther. 2011 Aug 29. Epub
- 62. Increased accumulation of skin advanced glycation end products is associated with microvascular complications in type 1 diabetes.**  
Araszkiwicz A. et al. Diabetes Technol Ther. 2011 Aug;13(8):837-42.
- 63. Assessment of skin autofluorescence as a marker of advanced glycation end product accumulation in type 1 diabetes.**  
Samborski P. et al. Pol Arch Med Wewn. 2011 Mar;121(3):67-72.
- 64. Advanced glycation end products, measured as skin autofluorescence and diabetes complications: a systematic review.**  
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- 65. Tissue advanced glycation end products are associated with diastolic function and aerobic exercise capacity in diabetic heart failure patients.**  
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- 68. Skin autofluorescence provides additional information to the UK Prospective Diabetes Study (UKPDS) risk score for the estimation of cardiovascular prognosis in type 2 diabetes mellitus**  
Lutgers H. et al: Diabetologia, 2009; 52(5): 789-797
- 69. Skin Autofluorescence: A tool to identify type 2 diabetic patients at risk for developing microvascular disease.**  
Gerrits E. et al. Diabetes Care. 2008; 31: 517-521
- 70. Skin autofluorescence is a strong predictor of cardiac mortality in diabetes**  
Meerwaldt R, et al. Diabetes Care 2007, 30: 107-112
- 71. Skin autofluorescence in type 2 diabetes: Beyond blood glucose**  
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- 72. Non-invasive AGE-measurements by skin autofluorescence in patients with Type 2 Diabetes Mellitus. Tool for risk-assessment of diabetes complications?**  
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- 73. Increased accumulation of skin advanced glycation end-products precedes and correlates with clinical manifestation of diabetic neuropathy**  
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- 74. The clinical relevance of advanced glycation endproducts (AGE) and recent developments in pharmaceuticals to reduce AGE accumulation.**  
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## **AGE Reader in cardiovascular disease**

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- 75. Skin accumulation of advanced glycation end products is increased in patients with an abdominal aortic aneurysm.**  
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- 76. Impact of Hemorheology Assessed by the Microchannel Method on Pulsatility Index of the Common Carotid Artery in Patients With Type 2 Diabetes Mellitus.**  
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- 77. Diverging effects of diabetes mellitus in patients with peripheral artery disease and abdominal aortic aneurysm and the role of advanced glycation end-products: ARTERY study - protocol for a multicentre cross-sectional study.**  
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- 78. A Comparative Study on Skin and Plasma Advanced Glycation End Products and Their Associations with Arterial Stiffness.**  
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- 79. Association of Skin Autofluorescence Levels With Kidney Function Decline in Patients With Peripheral Artery Disease.**  
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- 80. The Relationship Between Level of End-Products of Tissue Glycation and Pulse Wave Velocity in Non-diabetic Patients With Cardiovascular Disease.**  
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- 82. Evaluation of tissue accumulation levels of advanced glycation end products by skin autofluorescence: A novel marker of vascular complications in high-risk patients for cardiovascular disease.**  
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- 83. Skin autofluorescence, 5-year mortality, and cardiovascular events in peripheral arterial disease: all that glitters is surely not gold.**  
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- 84. Skin Autofluorescence Is Associated With 5-Year Mortality and Cardiovascular Events in Patients With Peripheral Artery Disease.**  
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- 85. Skin Autofluorescence, a Non-Invasive Marker for AGE Accumulation, Is Associated with the Degree of Atherosclerosis.**  
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- 87. Skin Autofluorescence as a Measure of Advanced Glycation End Product Deposition Is Elevated in Peripheral Artery Disease.**  
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- 89. Advanced glycation end product associated skin autofluorescence: A mirror of vascular function?**  
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- 90. Effects of alagebrium, an advanced glycation endproduct breaker, on exercise tolerance and cardiac function in patients with chronic heart failure.**  
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- 91. Skin autofluorescence is increased in patients with carotid artery stenosis and peripheral artery disease.**  
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- 92. Carotid artery intima media thickness associates with skin autofluorescence in non-diabetic subjects without clinically manifest cardiovascular disease.**  
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- 97. Relation between food and drinking habits, and skin autofluorescence and intima media thickness in subjects at high cardiovascular risk**  
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- 98. Advanced Glycation Endproducts (AGE) in chronic heart failure**  
Smit A. et al. Annals of New York Academy of Science 2008; 1126:225-30
- 99. Clinical relevance of Advanced Glycation Endproducts for vascular surgery**  
Meerwaldt R. et al. Eur J Vasc Endovasc Surg. 2008; 38,125-131
- 100. Skin autofluorescence is elevated in patients with stable coronary artery disease and is associated with serum levels of neopterin and the soluble receptor for advanced glycation end products.**  
Mulder DJ. et al. Atherosclerosis. 2007;197:217-223
- 101. Clinical and prognostic value of Advanced Glycation End-products (AGEs) in chronic heart failure.**  
Hartog J. et al Eur J Heart Failure 2007;9:1146-55
- 102. Skin Autofluorescence is an independent marker for Acute Myocardial Infarction**  
Mulder DJ, et al. Circulation: 2005; 112:II-371.
- 103. Skin Autofluorescence-Indicated Advanced Glycation End Products as Predictors of Cardiovascular and All-Cause Mortality in High-Risk Subjects: A Systematic Review and Meta-analysis.** Caverro-Redondo I. et al. J Am Heart Assoc. 2018 Sep 18;7(18)

## **AGE Reader in renal disease**

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- 104. Advanced glycation end-products (AGEs) accumulation in skin: relations with chronic kidney disease-mineral and bone disorder.**  
França R.A. et al. J Bras Nefrol. 2017 Jul-Sep;39(3):253-260.



- 105. Skin autofluorescence in acute kidney injury.**  
Lavielle A. et al. Crit Care. 2017 Feb 9;21(1):24.
- 106. Skin- and Plasmaautofluorescence in hemodialysis with glucose-free or glucose-containing dialysate.** Ramsauer B, et al. BMC Nephrol. 2017 Jan 5;18(1):5.
- 107. Comparing changes in plasma and skin autofluorescence in low-flux versus high-flux hemodialysis.**  
Ramsauer B. et al. Int J Artif Organs. 2015 (Epub)
- 108. Skin Autofluorescence Is Associated with Endothelial Dysfunction in Uremic Subjects on Hemodialysis.** Wang CC. et al. PLoS One. 2016 Jan 25;11(1):e0147771.
- 109. Skin autofluorescence advanced glycosylation end products (AGEs) as an independent predictor of mortality in high flux haemodialysis and haemodialysis patients.**  
Nongnuch A. et al. Nephrology (Carlton). 2015 May 25.
- 110. The effect of vegetarian diet on skin autofluorescence measurements in haemodialysis patients.**  
Nongnuch A. et al. Br J Nutr. 2015 Mar 12;119(3):433-439. (Epub)
- 111. Skin Autofluorescence Is a Predictor of Cardiovascular Disease in Chronic Kidney Disease Patients.**  
Furuya F. et al. Ther Apher Dial. 2014 Dec 29.
- 112. Tissue advanced glycation end products (AGEs), measured by skin autofluorescence, predict mortality in peritoneal dialysis.**  
Siriopol D. et al. Int Urol Nephrol. 2014 Nov 26.
- 113. Skin autofluorescence as a novel marker of vascular damage in children and adolescents with chronic kidney disease.**  
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- 114. Skin autofluorescence associates with vascular calcification in chronic kidney disease.**  
Maku A.Y. et al. Arterioscler Thromb Vasc Biol. 2014 Aug;34(8):1784-90
- 115. Skin Autofluorescence and All-Cause Mortality in Stage 3 CKD.**  
Fraser S.D. et al. Clin J Am Soc Nephrol. 2014 May 29. Epub
- 116. Skin Autofluorescence Predicts Cardiovascular Mortality in Patients on Chronic Hemodialysis.**  
Kimura H. et al. Ther Apher Dial. 2014 Jan 24
- 117. Skin autofluorescence is associated with the progression of chronic kidney disease: a prospective observational study.**  
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- 118. Skin and Plasma Autofluorescence During Hemodialysis: A Pilot Study.**  
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- 119. Tissue Advanced Glycation End Product Deposition after Kidney Transplantation.**  
Crowley LE et al. Nephron Clin Pract. 2013 Oct 15;124(1-2):54-59.
- 120. Advanced glycation end-products and skin autofluorescence in end-stage renal disease: a review.**  
Arsov S. et al. Clin Chem Lab Med. 2013 Apr 4:1-10.
- 121. Accumulation of tissue advanced glycation end products correlated with glucose exposure dose and associated with cardiovascular morbidity in patients on peritoneal dialysis.**  
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- 122. Skin autofluorescence as a marker of cardiovascular risk in children with chronic kidney disease.**  
Siriopol I. et al. Pediatr Nephrol. 2012 Sep 15. (Epub)

- 123. Factors influencing skin autofluorescence of patients with peritoneal dialysis.**  
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- 124. Decreased serum carnitine is independently correlated with increased tissue accumulation levels of advanced glycation end products in hemodialysis patients.**  
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- 125. Skin Autofluorescence: A Pronounced Marker of Mortality in Hemodialysis Patients.**  
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- 126. Advanced oxidation protein products and advanced glycation end products in children and adolescents with chronic renal insufficiency.**  
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- 127. Evaluation of advanced glycation end products accumulation, using skin autofluorescence, in CKD and dialysis patients.**  
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- 128. Skin autofluorescence and the association with renal and cardiovascular risk factors in chronic kidney disease stage 3.**  
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- 130. Skin autofluorescence as a measure of advanced glycation endproduct deposition: a novel risk marker in chronic kidney disease.**  
Smit AJ. et al. *Curr Opin Nephrol Hypertens*, 2010; 19(6):527-33.
- 131. Skin autofluorescence is associated with renal function and cardiovascular diseases in pre-dialysis chronic kidney disease patients.**  
Tanaka K. et al. *Nephrol Dial Transplant*. doi: 10.1093/ndt/gfq369
- 132. Advanced glycation end products, carotid atherosclerosis, and circulating endothelial progenitor cells in patients with end-stage renal disease.**  
Ueno H et al. *Metabolism*, 2010, doi: 10.1016/j.metabol.2010.04.001
- 133. Tissue-Advanced Glycation End Product Concentration in Dialysis Patients**  
McIntyre et al; *CJASN*, 2010; 5(1): 51-55
- 134. Does hepatitis C increase the accumulation of advanced glycation end products in haemodialysis patients?**  
Arsov S. et al. *Nephrol Dial Transplant* 2009; 25(3): 885-891
- 135. Skin-Autofluorescence Is an Independent Predictor of Graft Loss in Renal Transplant Recipients**  
Hartog J. et al, *Transplantation* • Volume 87, Number 7, April 15, 2009
- 136. Advanced Glycation End Products in Renal Failure: An Overview**  
Noordzij M. et al, *Journal of Renal Care* 2008
- 137. AGEs, autofluorescence and renal failure** Gerrits E. et al. *Nephrology Dialysis and Transplantation* 2009; 24: 710-713
- 138. Skin autofluorescence, a marker for advanced glycation end product accumulation, is associated with arterial stiffness in patients with end-stage renal disease**  
Ueno H. et al: *Metabolism Clinical and Experimental* 57 (2008) 1452–1457

- 139. Skin Autofluorescence, a measure of tissue advanced glycation endproducts (AGEs), is related to the diastolic function of dialysis patients**  
Hartog J. et al. Journal of Cardiac Failure. 2008; 14(7): 596-602
- 140. Risk factors for chronic transplant dysfunction and cardiovascular disease are related to accumulation of advanced glycation end-products in renal transplant recipients**  
Hartog JW, et al. Nephrol Dial Transpl 2006 Aug;21(8):2263-9
- 141. Skin autofluorescence, a measure of cumulative metabolic stress and advanced glycation endproducts, predicts mortality in hemodialysis patients**  
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DiagnOptics Technologies B.V. – Aarhusweg 4-9, 9723 JJ, Groningen, The Netherlands - [info@diagnoptics.com](mailto:info@diagnoptics.com)