Dr Sarah Aldred BSc (hons), MSc, PhD.

Senior Lecturer in Exercise Biochemistry

School of Sport, Exercise and Rehabilitation Sciences (/schools/sport-exercise/index.aspx)

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About

Dr Sarah Aldred describes herself as a skilled, enthusiastic and resourceful scientist. She is an expert in the field of oxidative stress, and has been researching chronic diseases of ageing associated with oxidative stress for more than 10 years.

Qualifications

BSc (hons) Chemistry with Analytical Chemistry (University of Hull)
MSc Toxicology (University of Birmingham)
PhD Biochemistry (University of Birmingham)

Biography

Sarah joined the School of Sport, Exercise and Rehabilitation Sciences in October 2003 in order to develop her research interests in oxidative stress within a thriving Sport Sciences department. Originally from Yorkshire, Sarah studied at the Universities of Hull and Birmingham, before undertaking postdoctoral research at Aston University.

Sarah's main research interests continue to lie in mechanisms of disease associated with oxidative stress, in particular within diseases associated with the ageing process, such as Alzheimer's disease, vascular dementia and cardiovascular disease. Sarah also has active research interests in exercise in healthy ageing.

Sarah's research group comprises postgraduate research students and final year dissertation students and Sarah is herself still actively involved in lab research.

Teaching

Teaching Load

Sarah is module organiser of the third year module 'oxidative stress in Exercise, Ageing and disease' and the first year module Biochemistry and cell physiology, and contributes to a number of other modules on the BSc Sport and Exercise Sciences, MSc Exercise and Sport Sciences, and the BMedSci courses.

- Biochemistry and Cell Physiology (2004-)
- Oxidative stress in Exercise, ageing and disease (2011-)
- Mechanisms of adaptation to exercise (2006-)
- Exercise Metabolism (2008-)
- BMedSci Biology of Ageing (2009-)

Teaching awards

Invited speaker at the 5th Annual Learning and Teaching conference, University of Birmingham, "*Innovative methods of teaching; developing laboratory based modules*" Feb 2008

Head of school award for excellence in learning and teaching, *Awarded for innovation in teaching and teaching management –(the first award of its kind),* 2007

Postgraduate associate certificate in Learning and Teaching, Aston University, 2002

Teaching management and administration:

Head of Education. School of Sport, Exercise and Rehabilitation Sciences (2011-ongoing)

Postgraduate supervision

Eight PhD students (six graduated, two second year); co/2nd-supervisor: Seven PhD students (five completed, two current)

Masters students (approx. 1 per annum MSc and Mres)

PhD students completed projects

- Oxidative stress in ageing (2009). M.S. Rohalu.

Associated publications:

Aldred S, and Rohalu, M. (2011). A moderate intensity exercise program did not increase the oxidative stress in older adults. Arch. Gerontol. Geriatr. Jan 12. [Epub

ahead of print]

Aldred S., Rohalu, M.S., Edwards, K.M., and Burns, V.E. (2009) Altered DHEA and DHEAS response to exercise in healthy older adults. JAPA. 17(1):77-88.

- Oxidative stress biomarkers in dementia (2011). S.J. Bennett.

Associated publications:

Aldred S, Bennett S, Mecocci P. (2010) Increased low-density lipoprotein oxidation, but not total plasma protein oxidation, in Alzheimer's disease. Clinical Biochemistry. Feb;43(3):267-71. Epub 2009 Sep 4.

Bennett, S., Grant, M.M., and **Aldred, S.** (2009) Oxidative stress in Vascular dementia & Alzheimer's disease; a common pathology. JAD. 17. 245-257.

Bennett, S., Grant, M.M., and **Aldred, S**. (2009) Oxidative stress in Vascular dementia & Alzheimer's disease; a common pathology. JAD. *17. 245-257.*

Bennett S, Grant M, Creese AJ, Mangialasche F, Cecchetti R, Cooper HJ, Mecocci P, **Aldred S.** (2011) Plasma Levels of Complement 4a Protein are Increased in Alzheimer's Disease. Alzheimer Dis Assoc Disord. Nov 2. [Epub ahead of print]

- Markers of immunosenescence and oxidative stress in healthy adults (2011). J.E. Turner.

Associated publications:

Turner JE, Campbell JP, Edwards KM, Howarth LJ, Pawelec G, **Aldred S**, Moss P, Drayson MT, Burns VE, Bosch JA. (2013) Rudimentary signs of immunosenescence in Cytomegalovirus-seropositive healthy young adults. Age (Dordr). Jul 12. [Epub ahead of print]

Turner JE, Bosch JA, Drayson MT, **Aldred S.** (2011). Assessment of oxidative stress in lymphocytes with exercise. J Appl Physiol. 2011 Jul;111(1):206-11. Epub 2011 Apr 14.

Turner JE, Bosch JA, **Aldred S.** (2011). Measurement of exercise-induced oxidative stress in lymphocytes. Biochem Soc Trans. Oct;39(5):1299-304.

Turner, J.E, Hodges, N.J, Bosch, J.A, and **Aldred, S.** (2011). Prolonged depletion of antioxidant capacity following ultra-endurance exercise. MSSE. 43 (9) 1770-1776.

Turner JE, **Aldred S**, Witard O, Drayson MT, Moss PM, Bosch JA. (2010). Latent Cytomegalovirus infection amplifies CD8 T-lymphocyte mobilisation and egress in response to exercise. Brain Behav Immun. 24(8) 1362-1370.

Research

- Exercise Biochemistry
- Lipoprotein oxidation
- Ageing, including atherosclerosis and dementia

Sarah's research interests focus on mechanisms of disease associated with oxidative stress. In particular within diseases associated with the ageing process, such as Alzheimer's disease, vascular dementia and cardiovascular disease. Sarah's research aims to determine the effects of exercise on disease process.

Since joining the School of Sport, Exercise and Rehabilitation Sciences in 2003, she has worked to link her previous research experience in biochemical mechanisms of disease with research within a thriving Sport Sciences department. Sarah has continued to research oxidatively modified proteins in chronic diseases associated with ageing – initiating research into the effect of exercise on these species in older adults and dementia sufferers.

Since 2008 Sarah has developed a unique area of research investigating exercise effects on Alzheimer's disease pathology, which is respected both nationally and internationally. This research has lead to prestigious invitations to be part of expert panels, steering committees for exercise interventions, and to lead research for the Alzheimer's Research UK in the Midlands (**www.le.ac.uk/ge/alzheimer (http://www.le.ac.uk/ge/alzheimer)**). The Midlands network is part of the wider Alzheimer's Research UK network.

Sarah's research has recently been funded by the Alzheimer's Society to research oxidative stress in Alzheimer's disease, and was recently the recipient of a SPARC award to look at the effect of exercise on lipoprotein oxidation in older adults. Sarah has presented her research at scientific conferences worldwide, and has talked about her research at a number of public meetings.

She was also recently invited to a panel of expert researchers to assess the effect of lifestyle on dementia, which led to a series of programmes for the BBC.

Other activities

Sarah is a member of a number of professional bodies to support her research including: The Biochemical Society; The American College of Sports Medicine, The Society of Toxicology, and European College of Sports Science. Sarah is also a member of the Alzheimer's Society and has given a number of talks at the Alzheimer's society Quality Research in Dementia public meetings, and the Alzheimer's Research Trust public awareness events. Sarah has also presented her work at the British Science Festival.

Sarah is an active citizen of the University. She is Head of Education in the School of Sport, Exercise and Rehabilitation Sciences and is a member of the College of Life and Environmental Sciences learning and teaching committees. She has held several administrative positions within the School during her appointment.

Publications

Brown, J.E., Mosley, M. and **Aldred, S**. (2013) Intermittent fasting: a dietary intervention for prevention of diabetes and cardiovascular disease? BJDVD. 13 (2) 68-72.

Paine, N.J., Ring, C., **Aldred, S**., Bosch, J.A., Wadley, A.J. and Veldhuijzen van Zanten, J.J.C.S. (2013) Eccentric-exercise induced inflammation attenuates the vascular responses to mental stress. BBI. 30. 133-142.

Turner, J.E., Bennett S.J., Bosch, J.A., **Aldred, S** and Griffiths, H.R. (2013) The antioxidant enzyme peroxiredoxin-2 is depleted in lymphocytes 7 days after ultra-endurance exercise. Free radical research. Free Radic Res. 2013 Oct;47(10):821-8. doi: 10.3109/10715762.2013.828836. Epub 2013 Aug 19.

Turner JE, Campbell JP, Edwards KM, Howarth LJ, Pawelec G, **Aldred S**, Moss P, Drayson MT, Burns VE, Bosch JA. (2013) Rudimentary signs of immunosenescence in Cytomegalovirus-seropositive healthy young adults. Age (Dordr). Jul 12. [Epub ahead of print]

Hartwich, D., **Aldred, S**., Fisher, JP. (2012) Influence of menstrual cycle phase on muscle metaboreflex control of cardiac baroreflex sensitivity, heart rate and blood pressure in humans. Experimental physiology. [Epub ahead of print].

Wadley AJ, Veldhuijzen van Zanten JJ, **Aldred S.** (2012). The interactions of oxidative stress and inflammation with vascular dysfunction in ageing: the vascular health triad. Age (Dordr). Mar 28. [Epub ahead of print]

Turner JE, Bosch JA, Drayson MT, **Aldred S.** (2011). Assessment of oxidative stress in lymphocytes with exercise. J Appl Physiol. 2011 Jul;111(1):206-11. Epub 2011 Apr 14.

Aldred S, Rohalu M. (2011). A moderate intensity exercise program did not increase the oxidative stress in older adults. Arch Gerontol Geriatr. Nov-Dec;53(3):350-3. Epub 2011 Jan 13.

Bennett S, Grant M, Creese AJ, Mangialasche F, Cecchetti R, Cooper HJ, Mecocci P, **Aldred S.** (2011) Plasma Levels of Complement 4a Protein are Increased in Alzheimer's Disease. Alzheimer Dis Assoc Disord. Nov 2. [Epub ahead of print]

Turner JE, Bosch JA, **Aldred S.** (2011). Measurement of exercise-induced oxidative stress in lymphocytes. Biochem Soc Trans. Oct;39(5):1299-304.

Turner, J.E, Hodges, N.J, Bosch, J.A, and **Aldred, S.** (2011). Prolonged depletion of antioxidant capacity following ultra-endurance exercise. MSSE. 43 (9) 1770-1776.

Turner JE, **Aldred S**, Witard O, Drayson MT, Moss PM, Bosch JA. (2010). Latent Cytomegalovirus infection amplifies CD8 T-lymphocyte mobilisation and egress in response to exercise. Brain Behav Immun. 24(8) 1362-1370.

Aldred S, Bennett S, Mecocci P. (2010) Increased low-density lipoprotein oxidation, but not total plasma protein oxidation, in Alzheimer's disease. Clinical Biochemistry. Feb;43(3):267-71. Epub 2009 Sep 4.

Sarah Aldred and Patrizia Mecocci. (2010) Decreased dehydroepiandrosterone and dehydroepiandrosterone sulfate concentrations in plasma of Alzheimer's disease patients. Arch Gerontol Geriatr. Jul-Aug;51(1):e16-8. Epub 2009 Aug 8

Ballard, C, Aarsland D, **Aldred S**, Bath P, Birks J, Brayne C, Kivipelto M, Richards M, Starr J, Smith D, and Kalaria R. (2010) Summary of the BBC dementia panel discussion. Alzheimers Society publications. Jan 2010.

Aldred S., Love,J.A., Tonks,L.A., Stephens,E., Jones, D.S., and Blannin,A.K. (2010) The effect of steady state exercise on circulating human IgE and IgG in young healthy volunteers with known allergy. JSAMS. Jan;13(1):16-9. Epub 2008 Oct 31.

Aldred S., Rohalu, M.S., Edwards, K.M., and Burns, V.E. (2009) Altered DHEA and DHEAS response to exercise in healthy older adults. JAPA. *17(1):77-88.*

Bennett, S., Grant, M.M., and **Aldred, S**. (2009) Oxidative stress in Vascular dementia & Alzheimer's disease; a common pathology. JAD. *17. 245-257.*

S. McPhee, Hans Degen, Keith Baar, Joaquin Perez Schindler, **Sarah Aldred**, Alun G. Williams, and David A. Jones. (2009). The training stimulus experienced by the leg muscles during cycling in humans. Exp Physiol. *94(6):684-94*

Aldred S.Oxidative and nitrative changes seen in lipoproteins following exercise (2007). Atherosclerosis. May.192(1):1-8.

Griffiths HR, **Aldred S**, Dale C, Nakano E, Kitas GD, Grant MG, Nugent D, Taiwo FA, Li L, Powers HJ. Homocysteine from endothelial cells promotes LDL nitration and scavenger receptor uptake. Free Radic Biol Med. (2006) Feb 1;40(3):488-500.

Aldred S, Sozzi T, Mudway I, Grant MM, Neubert H, Kelly FJ, Griffiths HR. Alpha tocopherol supplementation elevates plasma apolipoprotein A1 isoforms in normal healthy subjects. Proteomics. (2006) Mar;6(5):1695-703.

Aldred S. Travellers tales; Providing grants to attend scientific meetings. The Biochemist (2006) Feb; 28 (1) 60

Nakano E, Taiwo FA, Nugent D, Griffiths HR, **Aldred S**, Paisi M, Kwok M, Bhatt P, Hill MH, Moat S, Powers HJ. Downstream effects on human low density lipoprotein of homocysteine exported from endothelial cells in an in vitro system. J Lipid Res. (2005) Mar;46(3):484-93.

Aldred S, Grant MM, Griffiths HR. The use of proteomics for the assessment of clinical samples in research. Clin Biochem. 2004 Nov;37(11):943-52. (Most cited paper in clinical biochemistry in 2004).

Aldred, S., & Griffiths, HR. Oxidation of human low density lipoprotein; Investigation of antioxidant protection in vitro. Environmental Pharmacology and Toxicology. (2004) 15:2-3, 111-117

Polidori MC, Mattioli P, **Aldred S**, Cecchetti R, Stahl W, Griffiths H, Senin U, Sies H, Mecocci P. Plasma antioxidant status, immunoglobulin g oxidation and lipid peroxidation in demented patients: relevance to Alzheimer disease and vascular dementia. Dement Geriatr Cogn Disord. 2004;18(3-4):265-70.

Jeukendrup AE, **Aldred S**. Fat supplementation, health, and endurance performance. Nutrition. 2004 Jul-Aug;20(7-8):678-88.

Aldred S, Moore KM, Fitzgerald M, Waring RH. Plasma amino acid levels in children with autism and their families. J Autism Dev Disord. 2003 Feb;33(1):93-7.

Barralet JE, **Aldred S**, Wright AJ, Coombes AG. In vitro behavior of albumin-loaded carbonate hydroxyapatite gel. J Biomed Mater Res. 2002 Jun 5;60(3):360-7.

Aldred S, Foster JJ, Lock EA, Waring RH. Investigation of the localization of dehydroepiandrosterone sulphotransferase in adult rat kidney. Nephron. 2000 Oct;86(2):176-82.

Aldred S, Waring RH. Localisation of dehydroepiandrosterone sulphotransferase in adult rat brain. Brain Res Bull. 1999 Feb;48(3):291-6.

Conference abstracts:

Bennett, S and **Aldred, S**. 2008. Increased Low density lipoprotein oxidation, but not total plasma protein oxidation, in Alzheimer's Disease. Biochemical Society Transactions. Vol 36, part 5. P005

Aldred, Sarah; Matthews, Kathryn; Doubleday, Sarah; Jones, Rebecca S.; Gilson, Carina M.; Underwood, Thomas; Rohalu, Manjit Singh. 2006. The Effects of Exercise on DHEA, DHEAS and LDL Protein Carbonyl Concentrations in Healthy Adults. Medicine & Science in Sports & Exercise. 38(5) Supplement:S417,

Aldred S, Sozzi T, Mudway I, Grant MM, Neubert H, Kelly FJ, Griffiths HR. 2005. Alpha tocopherol supplementation elevates plasma apolipoprotein A1 isoforms in normal healthy subjectsSource: FREE RADICAL RESEARCH Volume: 39 Pages: S90-S90 Supplement: Suppl. 1

Rohalu, MS; **Aldred, S**. 2005 .The implications and effects of exercise intensity on the levels of dehydroepiandrosterone (DHEA) and its sulphated form (DHEA-S) FREE RADICAL RESEARCH Volume: 39 Pages: S75-S75

Mecocci P, Mattioli P, Cecchetti R, Griffiths H, **Aldred S**, Stahl W, Polidori MC. 2004. Protein oxidation, lipid peroxidation and antioxidant status are similarly altered in Alzheimer disease and vascular dementia. NEUROBIOLOGY OF AGING Volume: 25 Pages: S542-S542 Supplement: Suppl. 2

Aldred, S; Griffiths, HR. 2003. The use of proteomic analysis to assess oxidative insult, and protection by dehydroepiandrosterone, using cell model systems. TOXICOLOGICAL SCIENCES Volume: 72 Pages: 80-80 Meeting Abstract: 385

Aldred S., Banks M., Kitas GD., Griffiths HR. (2002). Increased levels of oxidised LDL in the plasma of rheumatoid patients with cardiovascular disease: consequences for monocyte scavenger receptor uptake of LDL