



Professor John Edward Hesketh  
**Professor of Mammalian Molecular Biology**

- Email: [j.e.hesketh@ncl.ac.uk](mailto:j.e.hesketh@ncl.ac.uk)
- Telephone: +44 (0) 191 208 8744
- Fax: +44 (0) 191 208 7424
- Address: Institute for Cell and Molecular Biosciences  
University of Newcastle  
Medical School  
Framlington Place  
Newcastle Upon Tyne  
NE2 4HH

### **Research Interests**

Molecular nutrition and nutrient-gene interactions with a focus on how genetic polymorphisms and dietary factors (particularly selenium) interact to underlie individual variation in dietary requirements and susceptibility to multifactorial disease. Selenium intake has been related to various diseases such as cancer, heart disease and our work is concerned with investigating whether a combination of low Se intake and genetic factors combine to influence disease susceptibility. Application of molecular and cell biology to the study of fundamental nutritional mechanisms.

RNA biology, cell organisation and intracellular trafficking, particularly spatial organisation of protein synthesis in eukaryotic cells and mRNA trafficking. Role of 3' untranslated region (3'UTR) in regulation of gene expression.

### **Publications**

- Zupanic A, Meplan C, Grellscheid SN, Mathers JC, Kirkwood TB, Hesketh JE, Shanley DP. RNA. 2014 Aug 21. [Epub ahead of print] [Detecting translational regulation by change point analysis of ribosome profiling data sets.](#)
- Hughes DJ, Fedirko V, Jenab M, Schomburg L, Méplan C, Freisling H, Bueno-de-Mesquita HB, Hybsier S, Becker NP, Czuban M, Tjønneland A, Outzen M,

- Boutron-Ruault MC, Racine A, Bastide N, Kühn T, Kaaks R, Trichopoulos D, Trichopoulou A, Lagiou P, Panico S, Peeters PH, Weiderpass E, Skeie G, Dagrund E, Chirlaque MD, Sánchez MJ, Ardanaz E, Ljuslinder I, Wennberg M, Bradbury KE, Vineis P, Naccarati A, Palli D, Boeing H, Overvad K, Dorronsoro M, Jakszyn P, Cross AJ, Quirós JR, Stepien M, Kong SY, Duarte-Salles T, Riboli E, Hesketh JE. *Int J Cancer*. 2014 Jul 9. doi: 10.1002/ijc.29071. [Epub ahead of print] [Selenium status is associated with colorectal cancer risk in the European prospective investigation of cancer and nutrition cohort.](#)
- Oxley A, Berry P, Taylor GA, Cowell J, Hall MJ, Hesketh J, Lietz G, Boddy AV. [An LC/MS/MS method for stable isotope dilution studies of  \$\beta\$ -carotene bioavailability, bioconversion and vitamin A status in humans.](#) *Journal of Lipid Research* 2014, **55**(2), 319-328.
  - Oxley A, Berry P, Cowell J, Hall M, Hesketh J, Lietz G, Boddy AV. [An LC-MS/MS method for stable isotope dilution studies of  \$\beta\$ -carotene bioefficacy and vitamin A status in humans.](#) In: *Nutrition Society Annual Summer Meeting*. 2013, Newcastle upon Tyne, UK: Cambridge University Press.
  - Méplan C, Dragstead LO, Ravn-Haren G, Tjønneland A, Vogel U, Hesketh J. [Association between Polymorphisms in Glutathione Peroxidase and Selenoprotein P Genes, Glutathione Peroxidase Activity, HRT Use and Breast Cancer Risk.](#) *PLoS ONE* 2013, **8**(9), e73316.
  - Oxley A, Berry P, Hesketh J, Boddy AV, Lietz G. [Gender differences in retinol metabolism are independent of  \$\beta\$ -carotene bioconversion.](#) In: *Nutrition Society Annual Summer Meeting*. 2013, Newcastle upon Tyne, UK: Cambridge University Press.
  - Maciel-Dominguez A, Swan D, Ford D, Hesketh J. [Selenium alters miRNA profile in an intestinal cell line: Evidence that miR-185 regulates expression of GPX2 and SEPSH2.](#) *Molecular Nutrition & Food Research* 2013, **57**(12), 2195-2205.
  - Crosley LK, Bashir S, Nicol F, Arthur JR, Hesketh JE, Sneddon AA. [The Single-Nucleotide Polymorphism \(GPX4c718t\) in the Glutathione Peroxidase 4 Gene Influences Endothelial Cell Function: Interaction with Selenium and Fatty Acids.](#) *Molecular Nutrition & Food Research* 2013, **57**(12), 2185-2194.
  - Pearson MJ, Khazaipoul S, Optun A, Pryme IF, Stern B, Hesketh JE. [Albumin 3'untranslated region facilitates increased recombinant protein production from Chinese hamster ovary cells.](#) *Biotechnology Journal* 2012, **7**(11), 1405-1411.
  - Hughes DJ, Jenab M, Meplan C, Schomburg L, Prehn J, Hesketh JE. [Colorectal Cancer Risk - the Influence of Selenoprotein Gene Variants and Blood Selenium Status.](#) In: *22nd Biennial Congress of the European Association for Cancer Research*. 2012, Barcelona, Spain: Pergamon.
  - Khaziapoul S, Pearson MJ, Pryme IF, Stern B, Hesketh JE. [CUG binding protein 1 binds to a specific region within the human albumin 3' untranslated region.](#) *Biochemical and Biophysical Research Communications* 2012, **426**(4), 539-543.
  - Gong G, Meplan C, Gautrey H, Hall J, Hesketh JE. [Differential effects of selenium and knock-down of glutathione peroxidases on TNF alpha and](#)

- [flagellin inflammatory responses in gut epithelial cells](#). *Genes & Nutrition* 2012, **7**(2), 167-178.
- Cole-Ezea P, Swan D, Shanley D, Hesketh J. [Glutathione Peroxidase 4 has a major role in protecting mitochondria from oxidative damage and maintaining oxidative phosphorylation complexes in gut epithelial cells](#). *Free Radical Biology and Medicine* 2012, **53**(3), 488-497.
  - Lietz G, Oxley A, Leung W, Hesketh J. [Single Nucleotide Polymorphisms Upstream from the  \$\beta\$ -Carotene 15,15'-Monooxygenase Gene Influence Provitamin A Conversion Efficiency in Female Volunteers](#). *Journal of Nutrition* 2012, **142**(1), 161S-165S.
  - Wakeling LA, Alatawi F, Ions LJ, Hesketh J, Ford D. [SIRT1-independent epigenetic effects of resveratrol mediated through the estrogen receptor](#). *In: Experimental Biology Meeting*. 2012, San Diego, CA: Federation of American Societies for Experimental Biology.
  - Gautrey H, Nicol F, Sneddon AA, Hall J, Hesketh J. [A T/C polymorphism in the GPX4 3' UTR affects the selenoprotein expression pattern and cell viability in transfected Caco-2 cells](#). *Biochimica et Biophysica Acta: General Subjects* 2011, **1810**(6), 284-291.
  - Fairweather-Tait SJ, Bao YP, Broadley MR, Collings R, Ford D, Hesketh JE, Hurst R. [Selenium in Human Health and Disease](#). *Antioxidants & Redox Signaling* 2011, **14**(7), 1337-1383.
  - Steinbrecher A, Méplan C, Hesketh J, Schomburg L, Endermann T, Jansen E, Åkesson B, Rohrmann S, Linseisen J. [Effects of selenium status and polymorphisms in selenoprotein genes on prostate cancer risk in a prospective study of European men](#). *Cancer Epidemiology Biomarkers and Prevention* 2010, **19**(11), 2958-2968.
  - Meplan C, Hughes DJ, Pardini B, Naccarati A, Soucek P, Vodickova L, Hlavata I, Vrana D, Vodicka P, Hesketh JE. [Genetic variants in selenoprotein genes increase risk of colorectal cancer](#). *Carcinogenesis* 2010, **31**(6), 1074-1079.
  - Mathers JC, Meplan C, Hesketh JE. [Polymorphisms Affecting Trace Element Bioavailability](#). *International Journal for Vitamin and Nutrition Research* 2010, **80**(4-5), 314-318.
  - Hesketh JE, Lietz G. [A network approach to micronutrient genetics: interactions with lipid metabolism](#). *Current Opinion in Lipidology* 2009, **20**(2), 112-120.
  - Fan KB, Chrzanowska-Lightowlers ZMA, Hesketh JE. [Fine mapping of interactions between eEF1 alpha protein and 3' UTR of metallothionein-1 mRNA](#). *Biochemical and Biophysical Research Communications* 2009, **386**(1), 82-88.
  - Kipp A, Banning A, van Schothorst EM, Meplan C, Schomburg L, Evelo C, Coort S, Gaj S, Keijer J, Hesketh J, Brigelius Flohe R. [Four selenoproteins, protein biosynthesis, and Wnt signalling are particularly sensitive to limited selenium intake in mouse colon](#). *Molecular Nutrition & Food Research* 2009, **53**(12), 1561-1572.

- Tyson J, Caple F, Spiers A, Burtle B, Daly AK, Williams EA, Hesketh JE, Mathers JC. [Inter-individual variation in nucleotide excision repair in young adults: effects of age, adiposity, micronutrient supplementation and genotype](#). *British Journal of Nutrition* 2009, **101**(9), 1316-1323.
- Meplan C, Nicol F, Burtle BT, Crosley LK, Arthur JR, Mathers JC, Hesketh JE. [Relative Abundance of Selenoprotein P Isoforms in Human Plasma Depends on Genotype, Se Intake, and Cancer Status](#). *Antioxidants & Redox Signaling* 2009, **11**(11), 2631-2640.
- Leung WC, Hessel S, Méplan C, Flint J, Oberhauser V, Tourniaire F, Hesketh JE, von Lintig J, Lietz G. [Two common single nucleotide polymorphisms in the gene encoding  \$\beta\$ -carotene 15,15'-monooxygenase alter  \$\beta\$ -carotene metabolism in female volunteers](#). *FASEB Journal* 2009, **23**(4), 1041-1053.
- Tourniaire F, Minihane AM, Hesketh J, Lietz G. [Do single nucleotide polymorphisms in beta-carotene dioxygenase-2 \(BCDO2\) gene affect the postprandial response?](#). *Proceedings of the Nutrition Society* 2008, **67**(OCE), E187.
- Meplan C, Crosley LK, Nicol F, Horgan GW, Mathers JC, Arthur JR, Hesketh JE. [Functional effects of a common single-nucleotide polymorphism \(GPX4c718t\) in the glutathione peroxidase 4 gene: Interaction with sex](#). *American Journal of Clinical Nutrition* 2008, **87**(4), 1019-1027.
- Hesketh J. [Nutrigenomics and selenium: Gene expression patterns, physiological targets, and genetics](#). *Annual Review of Nutrition* 2008, **28**(1), 157-177.
- Gautrey H, McConnell J, Lako M, Hall J, Hesketh J. [Staufen1 is expressed in preimplantation mouse embryos and is required for embryonic stem cell differentiation](#). *Biochimica et Biophysica Acta: Molecular Cell Research* 2008, **1783**(10), 1935-1942.
- Pagmantidis V, Meplan C, Van Schothorst EM, Keijer J, Hesketh JE. [Supplementation of healthy volunteers with nutritionally relevant amounts of selenium increases the expression of lymphocyte protein biosynthesis genes](#). *American Journal of Clinical Nutrition* 2008, **87**(1), 181-189.
- Pedder CM, Ford D, Hesketh JE. [Targeting of transcripts encoding membrane proteins in polarized epithelia: RNA-protein binding studies of the SGLT1 3'-UTR](#). *Biochemical Society Transactions* 2008, **36**(3), 525-527.
- Williams CM, Ordovas JM, Lairon D, Hesketh J, Lietz G, Gibney M, Ommen B. [The challenges for molecular nutrition research 1: Linking genotype to healthy nutrition](#). *Genes and Nutrition* 2008, **3**(2), 41-49.
- van Schothorst EM, Pagmantidis V, de Boer VCJ, Hesketh J, Keijer J. [Assessment of reducing RNA input for Agilent oligo microarrays](#). *Analytical Biochemistry* 2007, **363**(2), 315-317.
- Crosley LK, Meplan C, Nicol F, Rundlof AK, Arner ESJ, Hesketh JE, Arthur JR. [Differential regulation of expression of cytosolic and mitochondrial thioredoxin reductase in rat liver and kidney](#). *Archives of Biochemistry and Biophysics* 2007, **459**(2), 178-188.

- Bermano G, Pagmantidis V, Holloway N, Kadri S, Mowat NAG, Shiel RS, Arthur JR, Mathers JC, Daly AK, Broom J, Hesketh JE. [Evidence that a polymorphism within the 3'UTR of glutathione peroxidase 4 is functional and is associated with susceptibility to colorectal cancer](#). *Genes and Nutrition* 2007, **2**(2), 225-232.
- Meplan C, Crosley LK, Nicol F, Beckett GJ, Howie AF, Hill KE, Horgan G, Mathers JC, Arthur JR, Hesketh JE. [Genetic polymorphisms in the human selenoprotein P gene determine the response of selenoprotein markers to selenium supplementation in a gender-specific manner \(the SELGEN study\)](#). *FASEB Journal* 2007, **21**(12), 3063-3074.
- Joost H-G, Gibney MJ, Cashman KD, Gorman U, Hesketh JE, Mueller M, van Ommen B, Williams CM, Mathers JC. [Personalised nutrition: Status and perspectives](#). *British Journal of Nutrition* 2007, **98**(1), 26-31.
- Mathers JC, Hesketh JE. [The biological revolution: Understanding the impact of SNPs on diet-cancer interrelationships](#). In: *Journal of Nutrition: International Research Conference on Food, Nutrition, and Cancer*. 2007, Washington, DC: American Society for Nutrition.
- Mickleburgh I, Chabanon H, Nury D, Fan K, Burtle B, Chrzanowska-Lightowlers Z, Hesketh J. [Elongation factor 1 \$\alpha\$  binds to the region of the metallothionein-1 mRNA implicated in perinuclear localization - Importance of an internal stem-loop](#). *RNA* 2006, **12**(7), 1397-1407.
- Hesketh J, Wybranska I, Dommels Y, King M, Elliott R, Pico C, Keijer J. [Nutrient-gene interactions in benefit-risk analysis](#). *British Journal of Nutrition* 2006, **95**(6), 1232-1236.
- Levadoux-Martin M, Li Y, Blackburn A, Chabanon H, Hesketh JE. [Perinuclear localisation of cellular retinoic acid binding protein I mRNA](#). *Biochemical and Biophysical Research Communications* 2006, **340**(1), 326-331.
- Chabanon H, Mickleburgh I, Burtle B, Pedder C, Hesketh J. [An AU-rich stem-loop structure is a critical feature of the perinuclear localization signal of c-myc mRNA](#). *Biochemical Journal* 2005, **392**(3), 475-483.
- Nury D, Chabanon H, Levadoux-Martin M, Hesketh J. [An eleven nucleotide section of the 3'- untranslated region is required for perinuclear localization of rat metallothionein-1 mRNA](#). *Biochemical Journal* 2005, **387**(2), 419-428.
- Mickleburgh I, Burtle B, Hollas H, Campbell G, Chrzanowska-Lightowlers Z, Vedeler A, Hesketh J. [Annexin A2 binds to the localization signal in the 3' untranslated region of c-myc mRNA](#). *FEBS Journal* 2005, **272**(2), 413-421.
- Pagmantidis V, Bermano G, Villette S, Broom I, Arthur J, Hesketh J. [Effects of Se-depletion on glutathione peroxidase and selenoprotein W gene expression in the colon](#). *FEBS Letters* 2005, **579**(3), 792-796.
- Tyson J, Spiers A, Caple F, Hesketh JE, Mathers JC. [Inter-individual variation in nucleotide excision repair capacity: potential scope for dietary modulation of DNA repair](#). In: *Proceedings of the Nutrition Society*. 2005, University of East Anglia, Norwich: Cambridge University Press.
- Qatatsheh A, Seal CJ, Welfare MR, Hesketh JE. [Patients with ulcerative colitis show an altered frequency distribution of a single novel polymorphism](#)

- [\(SNP\) in the gene encoding the phospholipid hydroperoxide glutathione peroxidase 4 \(GPX4\)](#). In: *Proceedings of the Nutrition Society*. 2005, Telford International Centre, Telford, UK: Cambridge University Press.
- Gautrey H, McConnell J, Hall J, Hesketh J. [Polarised distribution of the RNA-binding protein Staufen in differentiated intestinal epithelial cells](#). *FEBS Letters* 2005, **579**(10), 2226-2230.
  - Bermano G, Pagmantidis V, Holloway N, Kadri S, Mowat A, Broom J, Hesketh JE. [Glutathione peroxidase 4 gene polymorphism and susceptibility to colorectal cancer](#). In: *Journal of Nutrition: International Research Conference on Food, Nutrition, and Cancer*. 2004, Washington, DC, USA: American Society for Nutrition.
  - Mickleburgh I, Burtle B, Nury D, Chabanon H, Chrzanowska-Lightowlers ZMA, Hesketh J. [Isolation and identification of a protein binding to the localization element of Metallothionein-1 mRNA](#). *Biochemical Society Transactions* 2004, **32**(5), 705-7066.
  - Chabanon H, Mickleburgh I, Hesketh J. [Zipcodes and postage stamps: mRNA localisation signals and their trans-acting binding proteins](#). *Briefings in Functional Genomics and Proteomics* 2004, **3**(3), 240-256.
  - Villette S, Kyle JAM, Brown KM, Pickard K, Milne JS, Nicol F, Arthur JR, Hesketh JE. [A novel single nucleotide polymorphism in the 3' untranslated region of human glutathione peroxidase 4 influences lipoxxygenase metabolism](#). *Blood Cells, Molecules, and Diseases* 2002, **29**(2), 174-178.
  - Paice AG, Hesketh JE, Towner P, Hirako M, Peters TJ, Preedy VR. [Alcohol increases c-myc mRNA and protein in skeletal and cardiac muscle](#). *Metabolism* 2002, **51**(10), 1285-1290.
  - Hesketh JE, Villette S. [Intracellular trafficking of micronutrients: from gene regulation to nutrient requirements](#). In: *Proceedings of the Nutrition Society: Symposium on Nutrition in the Post-Genomic Era*. 2002, London: Cambridge University Press.
  - Vasconcelos MH, Tam SC, Hesketh JE, Reid M, Beattie JH. [Metal- and tissue-dependent relationship between metallothionein mRNA and protein](#). *Toxicology and Applied Pharmacology* 2002, **182**(2), 91-97.
  - Hesketh JE, Villette S. [Symposium on 'nutrition in the post-genomic era' plenary session 2: Nutrient regulation of gene expression: Intracellular trafficking of micronutrients: From gene regulation to nutrient requirements](#). *Proceedings of the Nutrition Society* 2002, **61**(4), 405-414.
  - Levadoux M, Hesketh JE, Beattie JH, Wallace HM. [Influence of metallothionein on its function](#). *Biochemical Journal* 2001, **355**(2), 473-479.
  - Dalgleish G, Veyrone J-L, Blanchard J-M, Hesketh J. [mRNA Localization by a 145-nucleotide region of the c-fos 3'-untranslated region: Links to translation but not stability](#). *Journal of Biological Chemistry* 2001, **276**(17), 13593-13599.
  - Bermano G, Shepherd RK, Zehner ZE, Hesketh JE. [Perinuclear mRNA localisation by vimentin 3'-untranslated region requires a 100 nucleotide sequence and intermediate filaments](#). *FEBS Letters* 2001, **497**(2-3), 77-81.

- Levadoux M, Mahon C, Beattie JH, Wallace HM, Hesketh JE. [Nuclear import of metallothionein requires its mRNA to be associated with the perinuclear cytoskeleton](#). *Journal of Biological Chemistry* 1999, **274**(49), 34961-34966.