JOURNAL OF DEVELOPMENTAL ORIGINS OF HEALTH AND DISEASE







CONTENTS

FROM THE PRESIDENT Development and After Mark A. Hanson	1	M th N S
IN THIS ISSUE In This Issue Michael G. Ross	2	C TI Ca
EDITORIAL A New Forum for DOHaD Michael G. Ross	3	J. Re fu
COMMENTARY Eighty years of an influenza pandemic? E. Kajantie	4	ex D C C
REVIEWS A conceptual framework for the developmental origins of health and disease P. D. Gluckman, M. A. Hanson and T. Buklijas	6	in C R M
The economic cost of a poor start to life H. Alderman	19	G ne T.
ORIGINAL ARTICLES Lingering prenatal effects of the 1918 influenza pandemic or cardiovascular disease B. Mazumder, D. Almond, K. Park, E. M. Crimmins and C. E. Fin		M T. Pi m J.

Maternal predictors of neonatal bone size and geometry: the Southampton Women's Survey N. C. Harvey, M. K. Javaid, N. K. Arden, J. R. Poole, S. R. Crozier, S. M. Robinson, H. M. Inskip, K. M. Godfrey, E. M. Dennison, C. Cooper and the SWS Study Team	35
The effect of late gestation foetal hypoglycaemia on cardiovascular and endocrine function in sheep J. K. Cleal, S. Bagby, M. A. Hanson, H. M. Gardiner and L. R. Green	12
Relationships between early postnatal growth and metabolic function of 16-month-old female offspring born to ewes exposed to different environments during pregnancyD. S. van der Linden, P. R. Kenyon, H. T. Blair, N. Lopez-Villalobos, C. M. C. Jenkinson, S. W. Peterson and D. D. S. Mackenzie	50
Cardiac and vascular disease prior to hatching in chick embryos incubated at high altitude C. E. Salinas, C. E. Blanco, M. Villena, E. J. Camm, J. D. Tuckett, R. A. Weerakkody, A. D. Kane, A. M. Shelley, F. B. P. Wooding, M. Quy and D. A. Giussani	; 60
GDNF and MAPK-ERK pathway signaling is reduced during nephrogenesis following maternal under-nutritionT. Q. Henry, R. Z. Mansano, C. C. Nast, J. Lakshmanan, M. Abdallah, A. K. Abdel-Hakeem, M. Desai, M. G. Ross and T. R. Magee	67
Proteinuria in aging rats due to low-protein diet during mid-gestation	

J. A. Joles, D. V. Sculley and S. C. Langley-Evans 75

Cambridge Journals Online For further information about this journal please go to the journal web site at: journals.cambridge.org/doh





https://doi.org/10.1017/S2040174410000048 Published online by Cambridge University Press

EDITORIAL POLICY

Journal of Developmental Origins of Health and Disease publishes leading research in the field of developmental origins of health and disease (DOHaD), focusing on how the environment during early animal and human development, and interactions between environmental and genetic factors, influence health in later life and risk of disease. It publishes original research articles, short communications and reviews, and plans regular themed issues, with guest editors; it is also a platform for conference/workshop reports, and for opinion, comment and interaction. The journal is multi-disciplinary, with contributions from basic scientists working in the fields of physiology, nutrition, endocrinology and metabolism, developmental biology, molecular biology and epigenetics, human biology and anthropology, evolutionary developmental biology, and clinicians, nutritionists, epidemiologists, social scientists, economists, public health specialists and policy makers.

SUBSCRIPTIONS

Journal of Developmental Origins of Health and Disease (print ISSN 2040-1744, electronic ISSN 2040-1752) is published bimonthly in February, April, June, August, October and December, 6 parts forming a volume, by Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK/Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013–2473, USA. The institutional subscription price (excluding VAT) including electronic access of Volume 1 (2010) is £250 net (US \$413 in the USA, Canada and Mexico). The electronic-only price available to institutional subscribers is £210 (US \$347 in USA, Canada and Mexico). The print-only price available to institutional subscribers is £230 (US \$380 in the USA, Canada and Mexico). Single parts are £42 (US \$70 in the USA, Canada and Mexico) plus postage. Back volumes are also available.

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York 10994–2133. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions are available from Kinokuniya Company Ltd, PO Box 55, Chitose, Tokyo 156, Japan. Prices include delivery by air.

Periodicals postage paid at New York, NY, and at additional mailing offices. POSTMASTER: send address changes in the USA. Canada and Mexico to:

Epidemiology and Infection, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994–2133. Claims for missing issues should be made immediately on receipt of the subsequent issue.

DOHaD MEMBERS SUBSCRIPTION

Members of the International Society for Developmental Origins of Health and Disease (DOHaD) receive electronic access to the journal as part of their subscription to the Society (Standard membership rate: £45 / US\$70 / €50; Student membership rate: £20 / US\$30 / €22; Developing Country rate: see www.mrc.soton.ac.uk/dohad). For membership application details please visit www.mrc.soton.ac.uk/dohad. For additional print subscription members are asked to contact the Membership Secretary (dohad@mrc.soton.ac.uk) at DOHaD.

COPYRIGHT AND PERMISSIONS

This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. Copyright law) subject to payment to C.C.C. of the per-copy fee of \$25.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 2040-1744/2010 \$25.00.

ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, USA, is authorized to supply single copies of separate articles for private use only.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions.

For all other use, permission should be sought from Cambridge or the American Branch of Cambridge University Press.

ADVERTISING

Advertising queries for all parts of the world except the USA, Canada and Mexico to the Journals Advertising Co-ordinator: Rebecca Roberts, ad_sales@cambridge.org Address enquiries in the USA, Mexico and Canada only to: Lisa Pang, journals advertising@cup.org

OTHER BUSINESS CORRESPONDENCE

All other business correspondence should be sent to Dan Edwards, Commissioning Editor: dedwards@cambridge.org

INSTRUCTIONS FOR CONTRIBUTORS

Full Instructions for Contributors are available for download from journals.cambridge.org/doh

INTERNET ACCESS

This journal is included in the Cambridge Journals Online service which can be found at journals.cambridge.org. For further information on other Press titles access cambridge.org

DISCLAIMER

The views expressed in this journal represent those of the authors only. In no way can they be construed to necessarily reflect the views of either the Editors, the Publishers, or the Society.

© Cambridge University Press and the International Society for Developmental Origins of Health and Disease 2010

Printed in the United Kingdom by Latimer Trend, Plymouth

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see www.fsc.org for information.