



THE EFFECT OF NUTRITION ON GENES AND LIFE-LONG HEALTH



Over recent years, scientists have come to realise that genes passed from parents to children do not determine a fixed programme of development and can be influenced by environmental cues – or ‘epigenetic factors’ – that can alter the activity of genes.

There has been a strong research drive to understand how these epigenetic cues, particularly diet during pregnancy, affect the long-term health and disease of children. BHF Professor Mark Hanson and his team at the University of Southampton have conducted a series of studies in this field, focusing on the effect of pregnant women’s nutrition on their children’s life-long health.



Impact

Research led by BHF Professor Mark Hanson at the University of Southampton has shaped the global medical world’s approach to obesity and non-infectious diseases, including cardiovascular disease. Research linking a mother’s diet and lifestyle before and during pregnancy, with long-term infant health has directly influenced public healthcare policy at international (United Nations), national (Scientific Advisory Committee on Nutrition) and local (Southampton City) levels. Through changes in medical practice and public education programmes this research has already led to health benefits for tens of thousands of people.

We need your help to fund more research to understand how changes in nutrition before birth affect life-long health, to be able to have more effective interventions in the future.

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FOR EVERY
HEARTBEAT**
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1989

The Hertfordshire Cohort Study (HCS) is launched to evaluate the relationship between early growth, genetics, adult lifestyle and the risk of common age-related disorders



1997-2003

The BHF funds £270,000-worth of research into the effect of maternal nutrition on child health.



1998

The Southampton Women's Survey (SWS) is launched - the only European study of women and their children for which women's data and samples were collected before pregnancy. Results demonstrate that a woman's pre-pregnancy diet and lifestyle affect the long-term health of their child



2002/2003

Professor Mark Hanson is appointed BHF Chair of Cardiovascular Science and the BHF funds a £990,000 Cardiovascular Initiative award to Professor Mark Hanson



2007

The HCS findings are published; a key insight is that factors contributing to the development of cardiovascular disease can be transmitted across generations by non-genetic means. In other words, a mother's nutrition and lifestyle can fundamentally alter the DNA that she passes on to her child



2007-2009

Three patents are filed for the formulation of nutritional products for mothers and infants, following £10m of investment in research funding, raised through the global research consortium, EpiGen



2008-2013

The BHF funds an £820,000 5-year programme grant to study maternal, infant and childhood determinants of cardiovascular health



2008

2008

NICE publishes a guideline on nutrition for pregnant and breastfeeding mothers and their children, drawing on findings from the SWS



The University of Southampton launch LifeLab – an initiative to raise awareness and interest in the science behind health issues in young people, and to make positive changes to adolescent health-related attitudes



2008

2009

BHF Professor Mark Hanson meets Health Secretary Andrew Lansley to discuss implementation of the WHO Action Plan. Subsequently, Lansley presents evidence from the Southampton studies at the UN General Assembly Summit on Non-Communicable (non-infectious) Diseases



The World Health Organization launches an Action Plan for the Prevention of Non-Communicable (non-infectious) Diseases, informed by Southampton research



2010

2010

The Southampton Initiative for Health is launched – a training intervention with Sure Start's Children's Centre to improve diet and activity levels in women of child-bearing age. Over 150 staff are trained



NICE publishes a guideline on weight management before, during and after pregnancy based on SWS findings



2010-2012

Over £24m of funding is raised from the Medical Research Council, the European Union and National Institute for Health Research to fund research into the effect of nutrition on development and health



2011

The Scientific Advisory Committee on Nutrition (SACN) publishes a policy on early influences on chronic diseases in later life, drawing on SWS findings



2013

Health ministers begin to debate mandatory fortification of flour with folic acid to prevent congenital abnormalities, as recommended by the SACN report, based on SWS findings



2014

The BHF provide £225,000 for an Assessment of LifeLab Southampton: Engaging Teenagers in Increasing their Interest in Science to Improve their Health Behaviours



Research



Funding



Medical Milestone



Impact