# THE EARLY NUTRITION PROGRAMMING PROJECT

Project Number: FOOD-CT-2005-007036
Acronym: EARNEST
(EARly Nutrition programming - long term follow up of Efficacy and Safety Trials and integrated epidemiological, genetic, animal, consumer and economic research.)

# NEWSLETTER 6 - AUTUMN 2008

## Earnest completes third successful year

Professor Berthold Koletzko, Project Coordinator

EARNEST has been running for three years and is increasingly producing impressive results. The third annual review of the project took place in June. The Panel commented that the project was ambitious in scale and that its findings are of significant economic and social benefit. Some of the achievements outlined in the third annual report to the EU are highlighted below.

**Theme 1** Individual patient data meta-analyses on the effect of LCPUFA on growth and neurodevelpmental outcome have been carried out on data collected in four of the original cohorts followed up within EARNEST. Follow-up of children born to mothers supplemented with fish oils during the last trimester of their pregnancy found that sixteen years later, children whose mothers had been given the fish oil supplements had a significantly lower risk of developing asthma than those whose mothers had been given olive oil capsules[1].

**Theme 2** The ongoing assessment programme of cardiovascular risk parameters of adolescent participants in the ALSPAC cohort has been continued. Analysis of data on the maternal diet during pregnancy from the Danish national birth cohort revealed that intake of fish improved psychomotor developmental indices at 18 months of infantile life[2].

**Theme 3** Studies in a number of different animal models have found alterations in the expression of various genes related to obesity as a result of maternal nutrient restriction. In mice, adverse effects on fetal growth caused by maternal protein restriction were normalised by folate supplementation and forced catch-up growth, subsequent to fetal protein restriction, programmed the development of obesity.

**Theme 4** There has been excellent progress in studying consumer perceptions and understanding in this area. There are clear inter-country differences in health related behaviours of mothers, infant feeding intentions, and the views of mothers about the relative importance of infant diet on adult health.

The Early Nutrition Academy Symposium, held in Granada in April 2008, on "Demonstrating Early Programming in Human and Animal Models" attracted 136 scientists. The symposium was held between the project meeting of "EARNEST" and "Nutrimenthe" projects and thus provided a great opportunity to exchange and disseminate latest findings.

1. Olsen SF, Østerdal ML, Salvig JD, Mortensen LM, Rytter D, Secher NJ, Henriksen TB. Fish oil intake compared with olive oil intake in late pregnancy and asthma in the offspring: 16 y of registry-based follow-up from a randomized controlled trial. Am J Clin Nutr. 2008 Jul;88(1):167-75.
2. Oken E, Østerdal ML, Gillman MW, Knudsen VK, Halldorsson TI, Strøm M, Bellinger DC, Hadders-Algra M, Michaelsen KF, Olsen SF. Associations of maternal fish intake during pregnancy and breastfeeding duration with attainment of developmental milestones in early childhood: a study from the Danish National Birth Cohort. Am J Clin Nutr. 2008 Sep;88(3):789-96.


Rhonda Smith with Sue Nelson, BBC science correspondent, at the Daily Highlights briefing to journalists.

## EuroScience Open Forum, Barcelona 2008

TAPAS - is it safe? Is it healthy? Two controversial questions posed by CommNet, a network of communicators in eight FP6 projects, including EARNEST, to attract the attention of journalists, exhibitors, delegates and visitors to the 2008 EuroScience Open Forum (ESOF) in Barcelona in July. The event attracted over 500 journalists from around the world. Visitors to the booth were challenged to choose Tapas first according simply to taste but then to consider potential issues concerning the supply, delivery, preparation and consumption of Tapas on health and safety now and in the future for themselves and their families. Over 200 people completed the questionnaires, which allowed those manning the booth to draw their attention to the work of EC funded projects such as EARNEST and their potential for improving the health of EC citizens. 70 delegates attended the CommNet Symposium chaired by Rhonda Smith with speakers Prof Carmen Audera and Prof Nicholas Olea. The CommNet activity was chosen as a 'Daily Highlight' for the media with Rhonda Smith presenting on the purpose of the booth and the projects behind the activity. Spanish television, radio and local newspapers all covered CommNet's Tapas story!

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# Report of Granada Progress Meeting April 2008

The seventh General Assembly meeting took place in beautiful Granada, Spain as part of Granada Science Week - a gathering of scientists and healthcare professionals from three different EU funded research projects, HELENA, EARNEST and Nutrimenthe. The blue skies and snowy hills of the Sierra Nevada provided a dramatic backdrop to our discussions. Evening receptions in the shadow of the Alhambra, while being entertained by belly dancers, gave a very Andalusian feel to them.

The morning session of the General Assembly was an opportunity for members of the different Themes to update the whole group on their recent findings. **Prof Erika Isolauri** from Turku, Finland described some of their findings from the seven year follow up of the NAMI trial (Nutrition, Allergy, Mucosal Immunology and Intestinal Microbiota). This was a trial of a perinatal probiotic intervention in families with a history of atopic disease. They hypothesized that as growth is slower in children with atopic eczema, probiotics might lead to more normal growth rates. They have now completed the clinical 7-year follow-up and preliminary analysis of the data suggests that there was no difference in growth rates by seven years. Currently, the 10-year follow-up data on growth are being collected to confirm the long-term safety of the approach.

**Prof Sjurdur Olsen** described the results from the follow-up of children born to mothers supplemented with fish oils during the last trimester of their pregnancy who had a lower risk of asthma at age 16. The interpretation of the trial was complicated by the fact that children whose mothers had been given no supplements also had a lower risk of developing asthma. Though it is theoretically possible that it was the olive oil supplements that increased the risk of asthma, he said they considered that it was more likely that some of the mothers in the 'no oil' group had voluntarily increased their intake of fatty fish, or even taken fish oil supplements themselves, since all the mothers had been told that the trial was to test the benefits of fish oil on reducing the risk of pre-term delivery and low birth weight.

**Prof Harry McArdle** explained some analyses his group have been doing to try and identify which genes are important in controlling programming effects. The gatekeeper hypothesis proposes that common outcomes which arise from different nutritional interventions might be due to gatekeeper genes which are involved in metabolic pathways which have outcomes in common. So characterising which genetic changes were produced by different nutritional models and then identifying which were associated with the same outcome might be one way of pinpointing which genes are involved in metabolic programming. **Dr Sylvain Sebert** described his latest work on nutritional programming of plasma insulin and the FTO gene and **Prof Jan Kopecky** discussed AMP-activated protein kinase during the perinatal period and the control of muscle metabolism and thermogenesis.

The afternoon was given over to individual theme meetings. Two training workshops were also held during the progress meeting - one on the communication of science and another on compiling and comparing epidemiological data on maternal dietary intake collected in prospective EU birth cohorts.

## The Pan-European Comparative Study on Dietary Intakes in Pregnancy

Dr. Michelle Mendez from Spain led a two-day training workshop at the Granada meeting on for the pan-European study on Diet during Pregnancy which is being conducted as part of Earnest. As little is currently known about dietary intakes during pregnancy across Europe, the project will provide a benchmark for understanding similarities and differences in intakes of key components of the diet across different countries and regions. The workshop was attended by representatives from 12 of the 14 participating studies, including Austria, Italy, France, Germany, the Netherlands, Poland, Portugal, and Scotland, as well as participants from the Earnest Theme 2 projects in Denmark, England, Norway, and Spain. Participants from Greece and Sweden also plan to collaborate in this project.

The workshop focused on strategies used to address the project's major methodological challenge: the post-hoc harmonization of dietary intake data collected using different methods to maximize the comparability of these data. The methods used included the provision of carefully structured, detailed guidelines requesting that collaborators adhere to standardized food group definitions. Another key component of the successful harmonization was the interactive and iterative approach, with participants from each food culture/project determining how to apply these standardized definitions to their data with input from the coordinator. The workshop was interactive, with presentations on data collection and analysis challenges within their own projects from each of the collaborators. Preliminary results indicated that the harmonization was successful, as intakes of food groups and energy were reasonably comparable across participants.

Participants at the Epidemiology Workshop led by Dr Michelle Mendez, (4th from left).



SIXTH FRAMEWORK PROGRAMME
LMU

## ENA Symposium: Early nutrition programming in human and animal models

The symposium was part of Granada Science Week which brought together scientists from three EU funded research projects HELENA, EARNEST and Nutrimenthe. As there is much of common interest between these three projects, the Early Nutrition Academy, in the person of Professor Cristina Campoy from the University of Granada, organised a symposium on early nutrition programming to coincide with their progress meetings. It attracted 136 scientists from across Europe. Sessions on obesity and insulin resistance; brain development and mental performance; immune system development and infant feeding policies and communication meant a stimulating and informative day was in store with a number of presentations by scientists from EARNEST and Nutrimenthe.

**Dr Thomas Illig** from Institute of Epidemiology, Munich discussed DNA variants detected in type 2 diabetes and obesity which provide new information about their aetiologies. Both these conditions are polygenic and there are multiple interactions between the genetic risk and environmental factors which complicates the picture. So far only a few genes have been identified with type 2 diabetes and obesity and these explain only part of the genetic picture. Large genome-wide association studies will help to further understanding.

**Dr Elizabeth Isaacs** from Institute of Child Health in London described two new brain imaging techniques which they have exploited to detect small differences in the brain's architecture and to relate these to differences in early diet. Using these techniques, they found associations between the volume of the caudate nucleus and diet in the weeks following preterm birth and a significant relationship between minimum plasma taurine level soon after birth and maths performance at 7 years.

**Dr Yolanda Sanz** from the Institute of Agrochemistry and Food Technology, Spain described how microbial exposure, through colonization of the newborn intestine, is essential to fully boost the developent of the infant immune system and gastrointestinal health. She described the PROFICEL project, which is studying the influence of specific bacteria, the type of milk feeding, immune status and genetic background on the risk of coeliac disease in formula fed babies. She hoped that new insights into how gut bacteria modulate an array of the host's functions related to oral tolerance development would emerge from this approach.

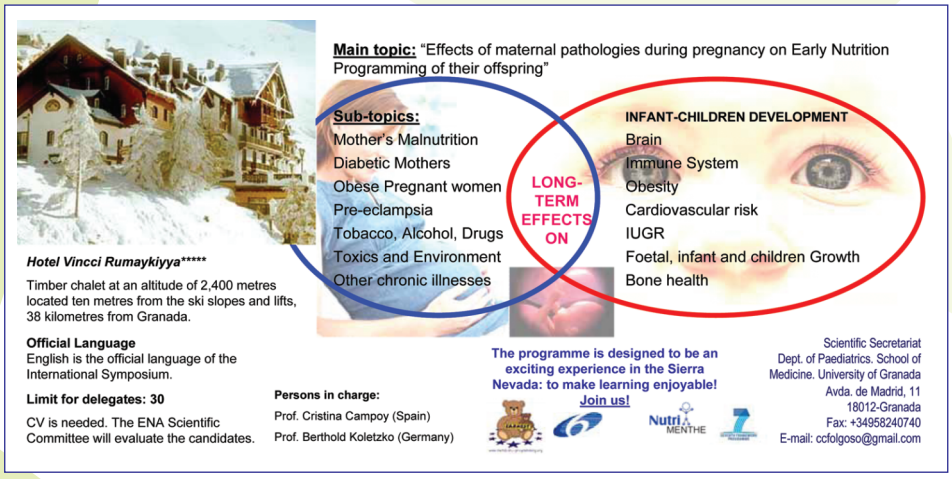
**Dr Heather Gage** from University of Surrey described a survey of maternal attitudes they carried out in five countries across Europe: England, Finland, Germany, Hungary and Spain. Almost all mothers agreed that the way they fed their babies was important for their health in their first year of life. However, when mothers were asked about specific long term health conditions such as obesity, high blood pressure and cancer, they tended to think early diet was less important.

## New study aims to reduce the number of big babies born to obese women

Earnest consortium member, Professor Lucilla Poston, is coordinating a new trial which hopes to find ways of reducing the risk of large for gestational age babies in obese women. The trial has recently been awarded £2 million by National Institutes of Health Research in the UK. The prevalence of obesity amongst pregnant women is spiralling as obesity rates in women of childbearing age increase. Obesity in pregnancy is a major cause of maternal mortality and increases the risk of maternal and neonatal morbidity. Obese women are more likely to give birth to both small for gestational age and large for gestational age babies, both of whom might have an increased risk of obesity themselves in later life. Insulin resistance is considered to play a central role, leading to gestational diabetes and excessive fetal growth, or to pre-eclampsia with an increased risk of fetal growth restriction.

The trial will develop and evaluate a complex behavioural intervention focusing on physical activity, dietary advice and group support. The first phase involves the development of the intervention, taking special care to ensure that it is acceptable to obese pregnant women. The second phase involves a pilot trial to check that the intervention changes dietary and physical activity behaviour. The actual trial will take place in the third phase of the study and will involve 2000 obese pregnant women. The primary neonatal outcome is large for gestational age deliveries, and the primary maternal outcome is impaired glucose tolerance.

The multi-disciplinary team brings together expertise from Kings College London, Guys and St Thomas' Foundation Trust Hospitals, Newcastle University, University College London, University of York and University of Southampton. It is hoped that the trial will result in a cost-effective behavioural intervention of dietary advice, physical activity and individual support, which improves pregnancy outcome in obese women, and which can be rapidly translated to NHS practice.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SIXTH FRAMEWORK PROGRAMME
LMU

**EARLY NUTRITION PROGRAMMING & HEALTH OUTCOMES IN LATER LIFE: Obesity & Beyond**

**Advances in Experimental Medicine and Biology 646**

**PRE-CONGRESS SATELLITE MEETING OF 15TH ECO**

**The proceedings will be available from Springer in early 2009.**

**www.springeronline.com**

**For more details about the project and to read previous newsletters, please go to www.metabolic-programming.org**

**The Power of Programming**

**INTERNATIONAL CONFERENCE ON DEVELOPMENTAL ORIGINS OF HEALTH AND DISEASE**

**Munich, May 6-8, 2010**

**Unlocking your potential for fame and fortune: press releases, presentations and proposals - everything you need to know about scientific communication.**

Scientific communication is an important, but often neglected, skill needed by today's researchers. This training course, led by Dr Margaret Ashwell, Rhonda Smith and Anne de la Hunty, and held as part of the Granada meeting in April 2008, covered communicating scientific ideas to the three most important audiences for an aspiring scientist: grant funding bodies, other scientists and the general public, via the media. It looked at how to make your ideas stand out and how to tailor your message to each particular audience. Twelve young scientists from Spain, Belgium, Germany, UK, and Poland attended the course. They were mostly PhD and post-doc researchers, though a few were more experienced.

The course was designed to be interactive and practical with lots of examples from real life. The session on how to give good presentations set out 10 golden rules on how to engage and hold your audience. Delegates were given examples of complicated and confusing slides and asked to suggest how they could be made clearer and more direct. The importance of a succinct executive summary was stressed in the session on writing successful research proposals. Not only does this help to organise your thoughts at the beginning, it helps to ensure that you have addressed the research call fully.

The media coverage received for the Granada meeting provided a stimulating context for the session on writing press releases, with lots of relevant examples. Delegates had first to critically evaluate actual press releases and consider whether they got the message across effectively. They then had to plan a press campaign for their own research and present it to the group who gave them constructive feedback.

## RELEVANT MEETINGS

**2008**

**4th Conference of Epidemiological Studies in Europe (CELSE)**
Bergen, Denmark. 11-14 November 2008
http://kongress.no/kongresser/kongresser-2008/celse--and-the-16th-norwegian-/

**2009**

**5th International Symposium on Diabetes and Pregnancy**
Sorrento, Italy. 26-28 March 2009 - www2.kenes.com/diabetes-pregnancy

**Diogenes ECO Satellite Meeting Prevention of Weight (Re)gain**
Amsterdam 4-5 May 2009 - www.diogenes-eu.org

**17th European Congress on Obesity,**
Amsterdam, The Netherlands. 6-9 May 2009 -www.easoobesity.org/eco2009

**18th Annual Meeting of the European Childhood Obesity Group (ECOG)**
Porto, Portugal. 5-7 June 2009 - ecog2008@skyros-congressos.com

**6th International Congress on Developmental Origins of Health and Disease**
Santiago, Chile. 19-22 November, 2009

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## SOME RECENT PUBLICATIONS BY EARNEST MEMBERS


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Gillman MW. The first months of life: a critical period for development of obesity. Am J Clin Nutr. 2008 Jun;87(6):1587-9.

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Olsen SF, Østerdal ML, Salvig JD, Mortensen LM, Rytter D, Secher NJ, Henriksen TB. Fish oil intake compared with olive oil intake in late pregnancy and asthma in the offspring: 16 y of registry-based follow-up from a randomized controlled trial. Am J Clin Nutr. 2008 Jul;88(1):167-75.

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**Editorial co-ordinator:**
Anne de la Hunty
*annedelahunty@btinternet.com*

**Design:**
Business Presentations
*www.business-presentations.co.uk*