- NUTRITION- KNOWLEDGE INNOVATION COMMUNITY - (N-KIC)

An open “Virtual International Research Insitution” for improving new opportunities to create innovative food concepts based on molecular and genetic nutrition .

Paolo Manzelli : <pmanzelli@gmail.com > & **Elisa Tachis** : <e.tachis@tinnova.it >
www.edscuola.it ; www.esserebelli.net ; www.wbabin.net

Scientific Content of COST ACTION <www.cost.esf.org/>

Title: Nutrition- Knowledge Innovation Community (Achronym: N-KIC)

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Abstract:

Molecular nutrition in terms of nutrigenomics represents an innovative transdisciplinary domain of interaction between diet and gene expression influencing nutrition in all living systems from bacteria to animals and humans. An important focus is the application of knowledge in nutritional biochemistry to the synergistic relationships among diet, health and disease susceptibility. In that perspective, the main goal of N-KIC Cost Action is to enhance the development of KBBE (Knowledge Based Bio Economy) across Europe and the world in molecular nutrition associated with health benefits and to promote innovation in the production and processes of functional food and feed in SME's and end-users.

Key Words:

Molecular and genetic nutrition, Bio-active components, micronutrients,nutraceuticals, functional food, nutritional health optimization, DNAdamage, mitochondrial disease prevention/treatment, animal-nutrigenomics,micro-nutrigenomics, molecular biosciences, bio-medicine, bio-sensors technology, molecular markers identification, signal transduction pathways, quorum sensing.

Preferred COST Domain: Trans Domain Proposal

Text of preliminary proposal:

BACKGROUND

There is significant evidence that bioactive components in food and feed are important factors of risk on human and animal health. Hence, analysis of bioactive food components and micronutrients in genetic nutrition has emerged as a novel and multidisciplinary research field that aims to elucidate how diet can influence human and animal health. At the same time, there still is a need:
-to overcome the limits of conventional scientific and technical methodologies so as to encompass studies on nutrients at the cellular level,on the metabolic functioning of nutrients in living organisms from men to

bacteria, and to promote studies on gene-nutrition-environment interactions exploring the advances of complex interactivity with biosensors working just a few nanometers wide.
-to implement/ strengthen a trans disciplinary approach (particularly for micronutrients and nano-scale genomics)
Therefore N-KIC, as an highly innovative network of excellence in the areaof life sciences, including experts not only in nutrition science and genomics but also scientists/researchers in biochemistry, biotechnology, managers of the food industry, experts in bioactive food components & micronutrients.

The aim is to improve functional food/feed production through the sharing of new ways of development of genetics-based nutritionand nanoscale-genomics and so eventually contribute to improve health and help decrease the burden of chronic diseases.

BENEFITS of N-KIC

-Contribution to a multidisciplinary transfer of knowledge, through the development of a scientific, economic and cultural KBBE (Knowledge Based Bio economy) that will also facilitate EU Food and Feed Industries;
-Contribution to high level research that will help promoting the competitiveness of small and medium sized enterprises (SMEs);
-Contribution to the assessment and treatment of diet-related diseases;
-Contribution to the impact assessment of new bio-sensors technology in modern nutrition research at nano-scale level;
-Contribution to the training capacity in the fields related to bioactive food components;
-Contribution to “brain gain” support to early stage researchers.

OBJECTIVES, DELIVERABLES AND EXPECTED SCIENTIFIC IMPACT

Objectives:
1.To develop N-KIC as a pan- European knowledge virtual database and data-sharing in molecular nutrition;
2.To address and prevent the development of the increasing incidence of diet-related diseases;
3.To promote training on molecular nutrition and functional foods for early stage researchers and managers and to provide opportunities of new careers;.
Means to achieve the objectives: knowledge exchange activities, promotional actions, dissemination activities, organisation of conferences, seminars, workshops, training activities
Targeted groups/ end users: scientific community, early stage researchers, industry and financial managers, decision makers, politicians and the broader public
Deliverables: see work plan.

Expected Scientific Impact
-Enhanced understanding and discovering of new scientific results and identification of opportunities for new nutraceutical product development (ingredients, functional foods, etc.)
-Improved understanding of nutrigenomic's needs on the basis of advanced performances of biosensors working at the nano-scale level of bio-technology
-Improved integration and transfer of knowledge, increased excellence and innovation potentials between genomic's nutrition research & the food/feed industry
-Improved awareness of nutrigenomics, personalised nutrition concepts and dietary recommendations for specific population groups, contributing to human health and quality of life

SCIENTIFIC PROGRAMME

The work plan is flexible, includes highly innovative elements and is based on six Work packages (WP), Milestones (Mil) and Deliverables (Del):

WP 1: Management and coordination
The objective is to secure a good coordination between the partners, timely achievements of all the project objectives and tasks, contacts with relevant national and European Organisations/Institutions operating in the field. See also organization

WP 2: State of the art and new future research proposals
The objective is to analyse the state of the art of knowledge and research in molecular nutrition in the EU and in the world. New proposals for research-action will be formulated.
Means to achieve the objective:
-carry out the state of the art at national/EU world level
-organization of 1 EU/International conference
Mil: proceedings of 1 EU/International conference completed

Del: Proceedings of 1 EU/International conference

WP 3: N-KIC Platform and integration strategy

The objective is to favor the conceptual integration, cooperation and dialogue between Nutrigenomic science and Nutraceutical technologies, so enabling a new nutritional paradigm. An integration strategy will be formulated.

Means:

-setting up of a virtual platform integrating all stakeholders
-organization of 2 seminars
-organization of 1 EU/International conference

Mil: proceedings of 2 seminars and 1 EU/ International conference completed.

Del: 3 Proceedings (2 seminars, 1 EU/International conference)

WP4: Prevention of diet related diseases

The objective is to address and prevent the development of the increasing incidence of diet-related-diseases.

Means:

-formulation of recommendations of crucial importance on personalized diets and on dietary supplements and on correlated subjects (obesity, anti-aging,alternative life styles and health's counselling,…) and their diffusion online
-organization of 1 EU/International conference

Mil: proceedings 1 EU/ International conference completed.

Del: report including recommendation to prevent diet-related diseases

WP5: Education and training

The objective is to enhance the educational level on molecular and genetic nutrition with a view to provide new career possibilities for early researchers and managers.

Means:

-Net-learning initiatives on the theme: "Nutrigenomics: from Men to Bacteria"
-Organization of 2 workshops
-“Brain Gain Program” for sharing teaching and learning experiences
-Short-term fellowships

Mil: net-learning initiatives and demos online; proceedings of 2 workshops completed.

Del: Report on net-learning initiatives and the brain gain program, Arrangement 3 fellowships

WP 6: Dissemination and exploitation

Dissemination is crucial and is not a one-off activity but rather comprehends continuous activities to be carried out during the whole lifetime of the project and to exploit results after project completion.

Means:

a. A project specific website will be developed with a triple purpose:
- disseminate news and information and promotional materials on the action for all visitors
- favour a real-time information on food interaction with gene function
- divulgate academic and industrial research and investigation
- serve as an e-platform for the stakeholder forum
- serve as an internal working tool for the action partners

b. Dissemination material
c. Organisation of 1 final conference

Mil: website activated, promotional material published, proceedings of final conference completed

Del: 1 dissemination plan, online quarterly newsletters, flyers, leaflets, press releases, usb sticks, joint publications and participation in other EU Framework programmes, proceedings of 1 final conference, 1 exploitation plan

INNOVATION

The originality of N-KIC consists in the development and propagation of a new nutritional paradigm thanks to a international network of excellence in molecular and genomic nutrition.

ORGANISATION

The organisation and coordination of N-KIC is ultimately in charge of the Management Committee (MC) comprising maximum 2 representatives for each party. Additionally, 3 working groups (WG) will be created:

a) **WG1**,responsible for the coordination and knowledge exchange of all research and innovation action b) **WG2**, responsible for the integration of academic research and the food industry c) **WG3**, responsible for all dissemination and training activities. Both the MC and the WGs will follow the rules and procedures outlined in COST documents COST 270/07 and 205/08. At the time of writing the present proposal 24 high profile partners (gender balanced) have expressed high interest, competence and willingness to collaborate in the proposed activities (15 COST countries: Belgium, Denmark, Germany, France, Italy , Ireland, Greece, Lithuania, Malta, Netherlands,Portugal, Spain , Slovak Rep., Sweden, Turkey; + 1 Cooperating State: Israel and 4 non-COST countries: USA, Canada, New Zealand, Morocco).

The intention is to further enlarge world wide the N-KIC network.

Communication will be take place through standard means and equipment. Its efficiency is guaranteed through the partnership itself that not has only has expertise in research but also in communication and divulgation activities.

All partners carry out research activities financed by their own and are highly interested in a platform where to collaborate and implement concerted action; hence, the COST programme provides the most suitable framework.

Finally, there is no overlapping with other Cost actions or other European initiatives; COST Action NUGO (COST action 926) will end in 2010 focuses specifically on nutrigenomics infrastructure and has therefore different mission and goals. Furthermore, COST action FA Action FA0602 is specifically focused on mitocochondrial diseases and health.

N-KIC will not perpetuate existing structures but will build on the results of similar initiatives exploring a wider framework of molecular and genetic nutrition. N-KIC deals with bioactive food components in molecular nutrition "f***rom men to bacteria***" and finally with genomics and genomic driven physiology/ physiological requirements for improving human health.

Participants interested in network at the date SEPT/23 /2009 :

Elisa Tachis,TINNOVA-Chamber of Commerce Florence,IT
Paolo Manzelli,EGOCREANET//ON-NS&A -University of Florence,IT <www.egocreanet.it>
Dimiter Dimitrov,Chalmers University of technology,SE
Gunter Gauglitz,University Tuebingen,DE
Thierry Arnould ,University of Namur (FUNDP) ,BE
Àurea Rodríguez,Centre Tecnològic de Nutrició i Salut,ES
Paul O'Toole,University College Cork,IE
Carlos Palmeira,University of Coimbra,PT
Jaap Keijer,Wageningen University,NL
Alexander Sirotkin,Institute of Genetics and Reproduction,SK
Charlotte Lauridsen,AARHUS UNIVERSITY,DK
Valdas Laurinavicius,Institute of Biochemistry,LT
Mehmet Ozsoz,Ege University Faculty of Pharmacy Bornova,TR
Rodrigue ROSSIGNOL ,INSERM,FR
Valdas Laurinavicius,Lithuanian Institute of Horticulture,LT
Ram Reifen,The Hebrew University of Jerusalem,IL
Chantal Wrutniak-Cabello,INRA,FR
Panagiotis Kalaitzis ,Mediterranean Agronomic Institute at Chania,GR
Danas Baniulis,Lithuanian Institute of Horticulture,LT
Monica Xuereb,Fondazzjoni Temi Zammit,MT

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