ZINC-NET: STUDYING THE ROLE OF ZINC IN PUBLIC HEALTH

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Micronutrient deficiencies of iron, zinc vitamin A, iodine, folic acid and selenium affect more than 50% of the world's population, with infants, children and women the most high risk groups.[6] Zinc deficiency, remains a widespread worldwide nutritional problem and in order to offset this problem, considerable efforts have been made to increase both the content and availability of zinc in staple crops and grains.[5]

To date, there is no reliable, sensitive and specific biomarker of zinc status. Additionally, there are no standardisation protocols across research groups in Europe to facilitate data comparisons. To address these problems through a multidisciplinary approach, four scientists (see below) co-founded Zinc-Net (Zn-Net) based on the successful Zinc-UK network that started in 2009 led by Dr Imre Lengyel. Since its foundation, Zn-Net has become a great network of scientists, supported by the European Commission (European Cooperation in Science and Technology COST Action TD1304), which was launched in October 2013, and is expected to complete its work by October 2017. www.cost.eu/COST_Actions/fa/TD1304

AIMS AND OBJECTIVES OF ZN-NET

The main aim of Zn-Net Action TD1304 is to establish a comprehensive understanding of the role of zinc in biology medicine and general public health and well-being by creating a multidisciplinary research platform. This platform brings together expertise from research groups throughout the COST countries and beyond to stimulate and accelerate new, innovative and high impact scientific research.

Secondary objectives of Zn-Net are defragmentation of the knowledge base across scientific, clinical and industrial partners, establishment of a Pan-European Research Platform, establishment of the Virtual Institute of Zinc Biology (VIZIBI) website, training and outreach.

In terms of the reach of the Zn-Net project, there are 27 COST countries involved: Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Israel, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom. There is also one COST country international partner: Australia.

ACHIEVEMENTS

Zn-Net has achieved a lot in its first two years. During the first year, a Zn-Net workshop and conference was undertaken in Budapest, Hungary and a conference and workshop on 'Measuring Zinc' was held in London. Also during the first year, two grants were awarded to support Zn-Net disseminations in Asilomar, USA and eight Short Term Scientific Missions (STSM) were supported.

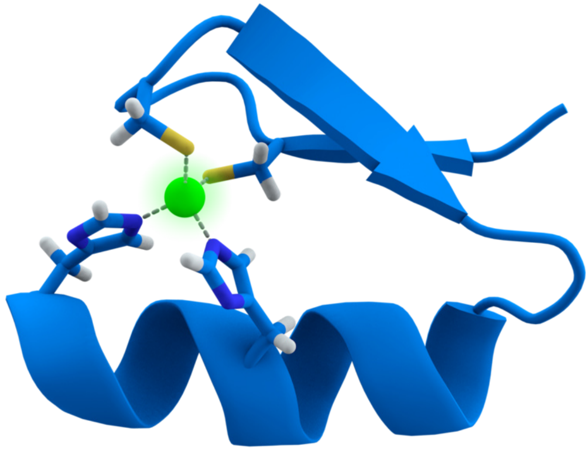
During the second year, in 2015, 21 STSMs were funded. A conference on 'Zn Biomarkers in Human Health and Disease' and a management committee meeting was organised in Granada, Spain, followed by a training school in Brno, Czech Republic on 'Metallothionein and its relation to zinc (II) ions'. An opportunity to present their STSM work was given to Early Stage Researchers (ESRs) in the Conference and Workshop meeting organised in Antalya, Turkey in November last year. This workshop included training in mentoring, networking academic writing and grant applications, commercialisation of intellectual property and psychology bias and personality types.

Currently this year, eight STSMs are being funded and a meeting in Sofia, Bulgaria was held in March with the focus on 'Dietary supplements vs food biofortification and the gut microbiome: human and animal health outcomes'. A planning MC meeting and ISZB conference is scheduled in Istanbul, Turkey in September and five more STSMs will be supported throughout the year.

The interesting theme of the Sofia Zn-Net meeting gathered excellent keynote speakers with expertise in this fascinating area. Biofortification is defined as the process of increasing the nutrition quality of foods by means of breeding of crops. Examples of zinc biofortification are on wheat, rice, beans, sweet potato and maize.[7] Cereals are known to be the main staple food in large parts of the world, but have the disadvantage of being low in zinc and low in other nutrients.[4] Consumption of zinc biofortified staple crops among zinc deficient populations should improve adequacy of zinc in the diet and reduce the risk of dietary zinc deficiency.[3] An example of trials in biofortification can be seen in the study by Chomba et.al,[1] where young Zambian children (mean age of 29 months old) met zinc requirements when they were fed with biofortified maize 34μg zinc/g grain. In this trial, zinc absorption per day was significantly higher in the biofortified maize group compared to the control group.[1]

The review by Welch[6] suggests that the nutrition and health sectors should turn to agricultural interventions to eradicate malnutrition in the world. Food fortification and supplementation has been implemented to lessen the problem. However, this has not been proven effective, whereas the advances in biotechnology have promised improvements of the output of bioavailable micronutrients from agricultural systems.[6] Therefore, biofortification of edible crops through biotechnology may help to lessen malnutrition in developing countries.[2]

Representation of the zinc-finger motif of proteins



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Zn-Net has gradually grown in members and continues working collaboratively to achieve the objectives of the Zn-Net project. Being part of Zn-Net is a wonderful experience to exchange zinc knowledge and work together across disciplines, to achieve overall end goals more efficiently.

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www.zinc-net.com/

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