BOOK OF ABSTRACTS

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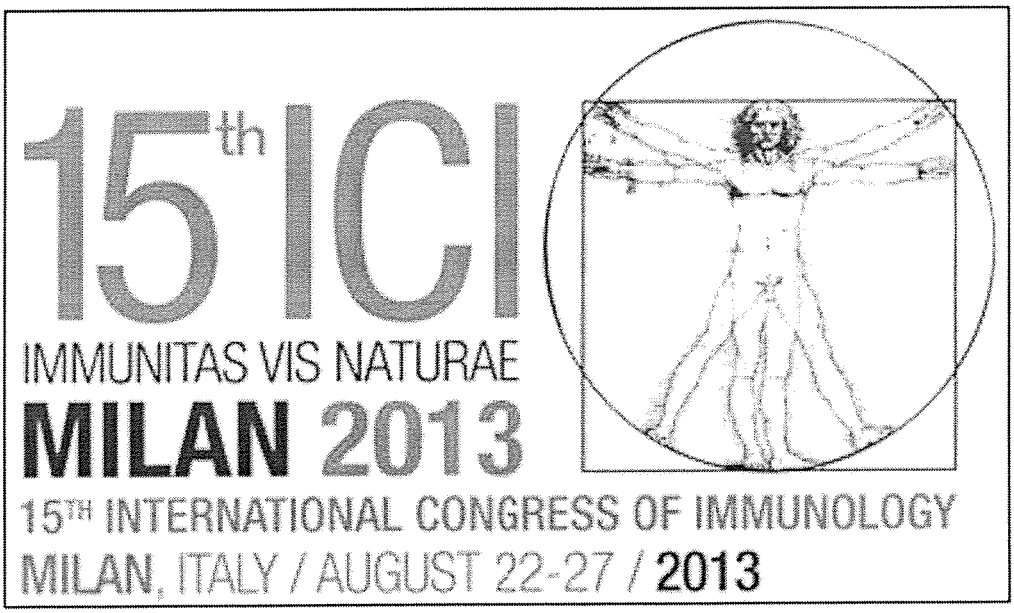

ANNOTATIONS

In the following we are publishing the abstracts as submitted by the authors.

Missing session numbers represent sessions with no abstracts associated.
Missing presentation numbers represent talks with no abstracts received as per date of production. Bold presentation numbers indicate the presenting author.

The sessions are in numerical order.

Keys and Abbreviations:

IL1.01.01	Invited Lecture
LB.1	Late Breaking Session 01
LL.1	Lunchtime Lecture
P1.01	Poster Presentation
PL.1	Plenary Lecture
PS.1	Lecture: Perspectives in Immunology
S.1	Symposium
SS.1	Sponsored Session
W1.01	Workshop

The Editors

CAMFs significantly inhibited NF-κB translocation from cytoplasm into the nucleus, dose-dependently. Furthermore, a 12-week sub-chronic CAMFs study was carried out on streptozotocin (STZ)-nicotinamide-induced type 2 diabetic rat model to evaluate glycemia, essential biochemical parameters, lipid levels, oxidative stress markers, and pro-inflammatory cytokines level. Our study result showed that CAMF reduced hyperglycemia while significantly increasing serum insulin, C-peptide, total protein, and albumin levels. Blood glucose, glycated hemoglobin, lipids and enzyme activities were restored to near normal levels. CAMF confirmed its antioxidant potential by elevating glutathione (GSH) and reducing malondialdehyde (MDA) levels in diabetic rats. Interestingly, CAMF down-regulated elevated tumor necrosis factor α (TNF-α), interleukin (IL)-1β, and IL-6 levels in tissues and serum of diabetic rats. We conclude that CAMF exerts apparent antidiabetic effects and represents a valuable nutraceutical candidate for insulin-resistant type 2 diabetes and its associated complications, such as dyslipidemia, oxidative stress, and inflammation.

P6.03.13
Can dietary intervention with whole grain decrease risk of type 2 diabetes by reducing inflammasome assembly and IL1β secretion by circulating human neutrophils?

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Central obesity, hypertension, dyslipidemia, and dysglycaemia are all common risk factors for development of type 2 diabetes (T2D) and have been suggested to induce a state of chronic low-grade systemic inflammation (CLGSI), driven by the proinflammatory cytokine interleukin 1β (IL1β), released by the predominant leukocyte in the blood, the neutrophils. Cell and animal studies suggest secretion of IL1β can be reduced by binding of short chain fatty acids (SCFAs) to the free fatty acid receptor 2 (FFAR2/GPR43) on the surface of neutrophils. In the human gut, fermentation of dietary fibers results in formation of SCFAs. These are capable of crossing the epithelial barrier and enter the blood stream. In the current study, we hypothesize that a diet rich in whole grain will increase SCFA-levels in the blood, reduce proinflammatory cytokine-levels (incl. IL1β) in the blood, and thus alleviate the state of CLGSI. Sixty adult study participants (SPs), harboring at least two of the risk factors for T2D development, are subjected to a cross-over dietary intervention. SPs will consume >75 g of whole grain (WG) daily for 8 weeks, and <10 g of WG daily for 8 weeks, separated by 6 weeks of wash-out. Flanking each 8-week period, a fasting blood sample will be taken and the immunological state will be evaluated by measuring blood cytokines levels (e.g. IL1β, TNFα, IL6, IL18, and INFγ), surface availability of IL1β-receptors on neutrophils, and expression levels of proinflammatory cytokines and regulatory components of IL1β, such as NLRP3 and caspase-1.

P6.03.14
Carbon monoxide-releasing molecule CORM-A1 attenuates the development of autoimmune diabetes in mice induced by multiple low doses of streptozotocin

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Recent studies identified carbon monoxide (CO) as a potential therapeutic molecule due to its anti-inflammatory and anti-apoptotic abilities. CO-releasing molecule CORM-A1 is a compound designed to liberate controlled quantities of CO in the cellular systems. However, its biological activity in autoimmune type 1 diabetes (T1D) has not been examined so far. Therefore, in the present study we investigated possible therapeutic value of CORM-A1 in the model of diabetes induced in C57BL/6 mice by multiple low doses of streptozotocin. Administration of CORM-A1 during diabetes induction, or even after the induction of the disease, improved clinical and histological signs of the disease. The interference with the disease was accompanied with reduced proinflammatory cytokine (IFN-γ, IL-2, IL-17 and TNF-α) production concurrent with increased IL-4 and TGF-β secretion. In addition to anti-inflammatory properties, *in vitro* studies revealed that CORM-A1 reduced cytokine-induced cell death of pancreatic islets, as well as beta cells (MIN and RINm5F insulinoma cells). However, a cytoprotective effect was lost when inactive CORM-A1 form, that does not liberate CO, or hemoglobin, a scavenger of CO, was employed. Although the molecular mechanisms involved in the drug action remain to be established, our results suggest that the observed beneficial effect of CORM-A1 in the disease process could be attributed, at least partly, to the interference of CORM-A1-released CO with cytokine-mediated pro-apoptotic stimuli within endocrine pancreas. CORM-A1 may thus represent a novel treatment strategy that would operate through interfering with an islet-directed autoimmune response.
(Project ON173013)

P6.03.15
Activation of Natural Killer T Cells Promotes Th2 Immune Response in Adipose Tissue of Obese Galectin-3 Deficient Mice and Improves Systemic Glucose Homeostasis

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Diet induced obesity leads to inflammation in adipose tissue and insulin resistance. After shorter high-fat diet feeding (15 weeks) these effects, accompanied with an increase in IFN-γ expressing NKT cells, were seen in Galectin-3 deficient (LGALS3$^{-/-}$) mice but not in wild type C57BL/6 mice. To elucidate the role of NKT cells activation and the role of Galectin-3 in this process we treated mice with lipid agonist α-galactosylceramide (α-GalCer). We found that activation of NKT cells by α-GalCer significantly decreased fasting blood glucose and insulin levels and homeostasis model assessment of insulin resistance (HOMA-IR) in obese LGALS3$^{-/-}$ mice fed high-fat diet for 15 weeks. After treatment, visceral adipose tissue (VAT) of obese LGALS3$^{-/-}$ mice exhibited increased incidence of CD3^{+}NK1.1^{+} NKT, NK1.1^{+} and CD11c^{+} dendritic cells, while F4/80^{+} macrophages were decreased. In addition, the number of IL-4 and IL-5 expressing NKT cells were increased in VAT and was associated with higher levels of IL-4 and IL-13, and lower IL-1β in sera of obese LGALS3$^{-/-}$ mice. α-GalCer increased NK1.1^{+} and CD11c^{+} dendritic cells and significantly reduced pro-inflammatory F4/80^{+}CD11c^{+}CD206^{+} and F4/80^{+}IL-6^{+} macrophages in livers of obese LGALS3$^{-/-}$ mice. *In vitro* stimulated splenocytes by anti-CD3 and anti-CD28 antibodies from obese LGALS3$^{-/-}$ mice treated with α-GalCer produced significantly higher amounts of IL-4 and IL-10 compared to saline-treated diet-matched controls. These findings suggest that activated NKT cells skew the immune response to a Th2 phenotype where Th2 cytokines and anti-inflammatory IL-10 could be responsible for the improvement of insulin resistance in obese Gal-3 deficient mice.

P6.03.16
IL-2 and rapamycin in immunotherapy of type 1 diabetes: friends or foes ?

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Administration of low-dose IL-2 alone or combined with rapamycin (RAPA) prevents type 1 diabetes (T1D). Also, low-dose IL-2 cures