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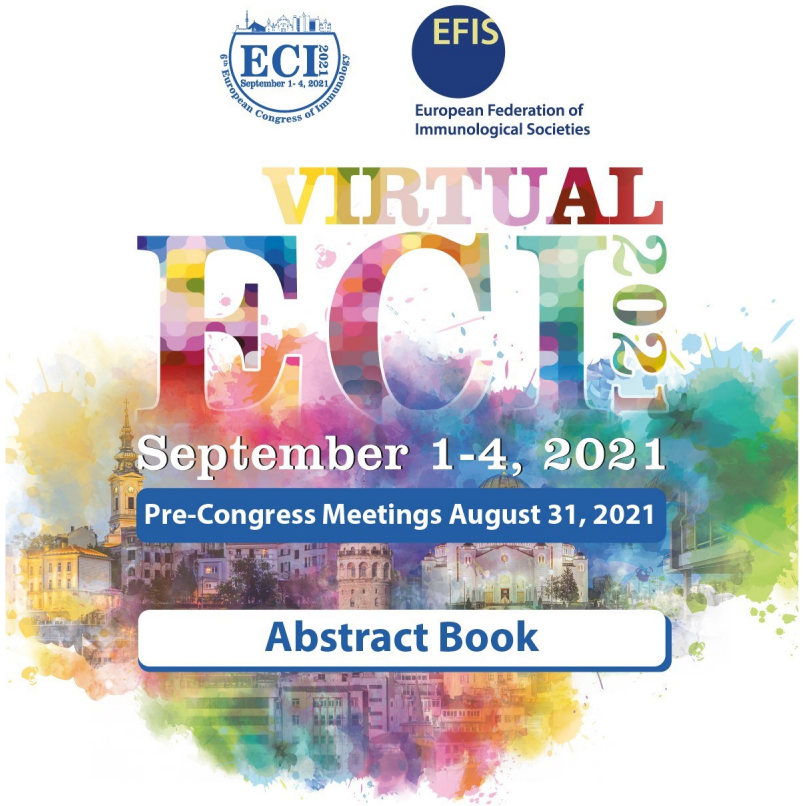
ISSN 0014-2980 · EJIMAF51 (Supplement S1) · Vol.51 · Supplement S1 · August 2021

50th anniversary

European Journal of Immunology

Supplement S1



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DOI: 10.1002/eji.202170200

European Journal of Immunology

Abstracts of ECI 2021

6th European Congress of Immunology

1-4 September 2021

Virtual meeting

European Journal of Immunology Volume 51, Suppl. 1, August 2021

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DOI: 10.1002/eji.202170200

POSTER PRESENTATIONS

P-0890

Cold exposure reprograms monocytes and protects from neuroinflammation

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Obesity is linked to development of metabolic and inflammatory diseases. However, effects of a negative energy balance and a metabolically active phenotype on the immune system and immune-mediated diseases are poorly understood. Here we use cold exposure as an inducer of energy expenditure, which mainly acts by activating the UCP1-mediated brown adipose tissue thermogenesis. We show that cold exposure modulates monocytes and consequently T cell priming, resulting in decreased disease severity in a mouse modelof multiple sclerosis, experimental autoimmune encephalomyelitis (EAE). Specifically, we found that cold exposure reduces monocytes in the bone marrow and changes their immunologic and metabolic phenotype in the circulation. Exposure to cold temperatures decreases the EAE severity independent of UCP1-mediated thermogenesis. Cold exposure reduces pathogenic T cell cytokine expression and MHCII expression of monocytes during EAE. Depleting the monocytes via genetic or pharmacological CCR2 blockade abolished T cell cytokine expression at EAE onset, implying that cold exposure may affect T cell priming via modulation of monocytes. Accordingly, EAE is unchanged when cold exposure is applied only during the effector phase of the disease. Our work provides systematic overview on the immune changes during exposure to cold and could have implications in prevention and treatment of immune-mediated diseases.

Keywords: Adaptive immunity, autoimmunity, metabolic control of immune responses, multiple sclerosis, myeloid cells, neuroimmunology

P-0891

Anti-melanoma effects of Hyper-harmonized hydroxylated fullerene water complex and hyperpolarized light *in vivo*

Dijana Dračа[1], Milica Markelić[2], Marija Mojić[1], Sanja Jelača[1], Sanja Mijatović[1], Zorana Jović[3], Aleksandra Dragičević[3], Djuro Koruga[3], Danijela Maksimović Ivanić[1]

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In our recent study we have demonstrated antitumor effects of Hyper harmonized hydroxylated fullerene water complex (3HFWC) and hyperpolarized light (HPL) on melanoma cell lines *in vitro*. The aim of this study was to reveal their therapeutic effects *in vivo* in syngeneic model of melanoma in C57BL/6 mice. Treatment started when tumors became palpable. Mice were irradiated 2x20min daily with Bioptron® device equipped with HPL filter; with/without 3HFWC (0.145mg/ml) in drinking water ad libitum or 3HWC alone. Our results demonstrated the absence of 3HFWC and HPL side effects (no weight loss nor signs of nephro- and hepatotoxicity). Tumor growth was decreased in all treated groups with most profound effect in combined treatment. Histological examination revealed abolished proliferative capacity (significantly decreased mitotic index and nuclear PCNA immunopositivity of melanoma cells). Stimulation of melanin pigmentation and increased incidence of enlarged lipofuscin-filled melanoma cells suggest differentiation and pro-senescent effects of 3HFWC and HPL. Analysis of tumor infiltrating immune cells indicates strong potentiating of antitumor immune response through the increase of cytotoxic CD8+ and NK cells infiltration as well suppression of Treg, myeloid-derived suppressors and tumor-associated M2 macrophages. Taken together, our results reveal at least two mechanisms of anti-melanoma effects of 3HFWC and HPL: 1) directly, through the proliferation inhibition as well the stimulation of differentiation and senescence of melanoma cells; and 2) through the stimulation of antitumor immune response. In conclusion, the combination of 3HFWC and HPL presents potentially promising strategy in cancer therapy.

Keywords: Cancer immunology, *in vivo* tumor models, microenvironment

P-0892

Paucigranulocytic asthma: do sputum macrophages matter?

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Although paucigranulocytic asthma (PGA) is the most common phenotype of stable asthma, its features are not adequately studied. In this study, we aim to display the characteristics of PGA. 116 non-smoker adult asthma patients (80% female, mean age 39± 12.9) admitted to three tertiary centres were included. Their demographic and clinical features, allergy status, biochemical results, Asthma Control Test (ACT) scores, spirometry and exhaled nitric oxide (FeNO) measurements were obtained. Induced sputum cytometry was performed. According to induced sputum cell counts, four phenotypes were detected: eosinophilic (EA) (22.4%), mixed (MGA) (6.9%), neutrophilic (NA) (7.8%) and paucigranulocytic (62.9%). In sputum, macrophages were higher in the PGA group compared to other groups (PGA vs NA and PGA vs MGA: p<0.001, PGA vs EA: p=0.03). The atopy rate between phenotypes was the same. Although forced expiratory flow 1st second (FEV1) was similar in four groups, FEV1/FVC was higher (p=0.013) and FEV1 reversibility was lower in PGA patients than the corresponding values in other phenotypes (p=0.015). Low reversibility was comparable in both inhaled corticosteroid naive PGA patients and in those on ICS treatment. Although insignificant, FeNO and blood eosinophil counts were higher in MGA and EA groups while these were the lowest in the PGA group. Uncontrolled asthma ratio was low in PGA (16%) while it was 11% for NA, 25% for MG and 23% in EA. Macrophages are predominant in sputum of PGA patients. Besides lower uncontrolled asthma ratio, lower FEV1 reversibility is a prominent characteristic of this phenotype.

Keywords: Granulocytes, allergic disorders, eosinophils, macrophage

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