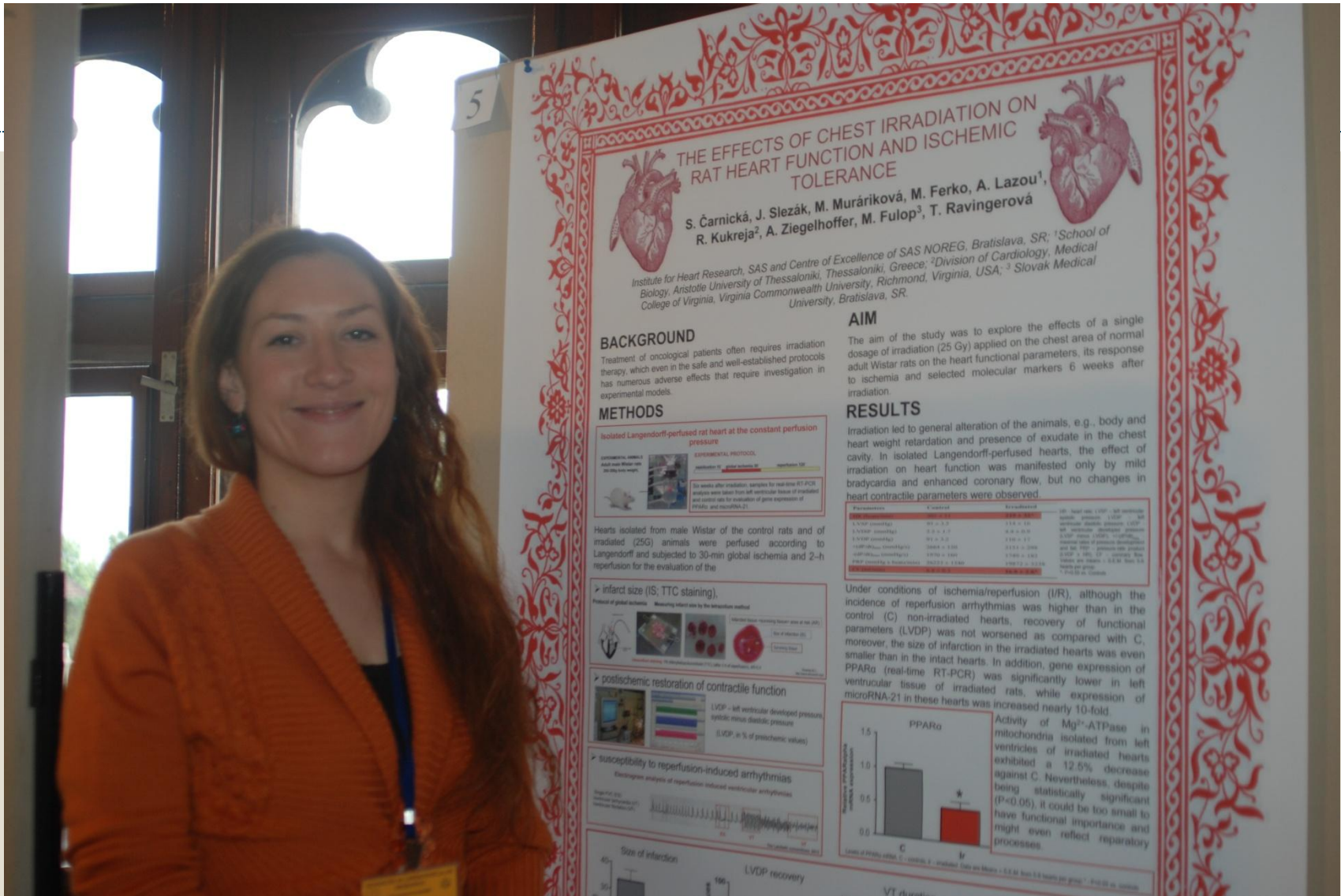


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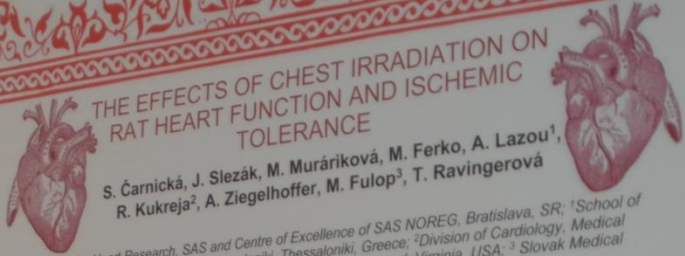
“Pokroky v kardiovaskulárnom výskume“



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THE EFFECTS OF CHEST IRRADIATION ON RAT HEART FUNCTION AND ISCHEMIC TOLERANCE



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BACKGROUND

Treatment of oncological patients often requires irradiation therapy, which even in the safe and well-established protocols has numerous adverse effects that require investigation in experimental models.

METHODS

Isolated Langendorff-perfused rat heart at the constant perfusion pressure

EXPERIMENTAL PROTOCOL

Experimental animals: Male Wistar rat (250g)

Experimental protocol: Isolated rat heart perfused at constant pressure (100 mmHg)

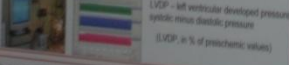
30 weeks after irradiation, samples for real-time RT-PCR analysis were taken from left ventricle tissue of irradiated and control rats for evaluation of gene expression of PPARα and microRNA-21.

Hearts isolated from male Wistar of the control rats and irradiated (25G) animals were perfused according to Langendorff and subjected to 30-min global ischemia and 2-h reperfusion for the evaluation of the

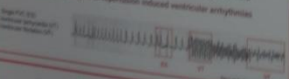
> infarct size (IS, TTC staining).

Percent of global ischemia - Measuring infarct size by the triphenyltetrazolium method

> postischemic restoration of contractile function



> susceptibility to reperfusion-induced arrhythmias



Size of infarction

LVDP recovery

AIM

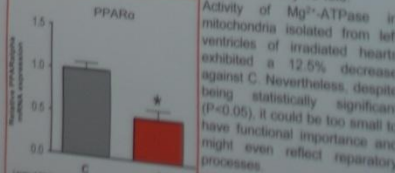
The aim of the study was to explore the effects of a single dosage of irradiation (25 Gy) applied on the chest area of normal adult Wistar rats on the heart functional parameters, its response to ischemia and selected molecular markers 6 weeks after irradiation.

RESULTS

Irradiation led to general alteration of the animals, e.g., body and heart weight retardation and presence of exudate in the chest cavity. In isolated Langendorff-perfused hearts, the effect of irradiation on heart function was manifested only by mild bradycardia and enhanced coronary flow, but no changes in heart contractile parameters were observed.

Parameters	Control	Irradiated	100 - heart rate (100% - 98 ventricles/minute) (100% - 98 ventricles/minute)
LVDP (mmHg)	93.0 ± 2.2	91.0 ± 2.4	98.0 ± 2.5
LVDPmax (mmHg)	9.0 ± 1.2	8.8 ± 1.0	9.5 ± 1.1
LVDPmin (mmHg)	91.0 ± 2.2	91.0 ± 2.4	98.0 ± 2.5
LVDPmax/min (mmHg)	9.0 ± 1.2	8.8 ± 1.0	9.5 ± 1.1
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Under conditions of ischemia/reperfusion (I/R), although the incidence of reperfusion arrhythmias was higher than in the control (C) non-irradiated hearts, recovery of functional parameters (LVDP) was not worsened as compared with C, moreover, the size of infarction in the irradiated hearts was even smaller than in the intact hearts. In addition, gene expression of PPARα (real-time RT-PCR) was significantly lower in left ventricular tissue of irradiated rats, while expression of microRNA-21 in these hearts was increased nearly 10-fold.



Activity of Mg²⁺-ATPase in mitochondria isolated from left ventricles of irradiated hearts exhibited a 12.5% decrease against C. Nevertheless, despite being statistically significant (P<0.05), it could be too small to have functional importance and might even reflect reparatory processes.



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CHANGES IN RESPONSES TO RADIATION



Regulation of elevated telomerase, telomeric subunit and hTERT activity by telomerase RNA in aged mice and human cells

Abstract: Telomerase is a ribonucleoprotein complex composed of an RNA subunit and a protein subunit, hTERT. Telomerase activity is elevated in many cancer cells and in some normal cells, including stem cells. We have investigated the regulation of telomerase activity in aged mice and human cells. We found that telomerase activity is elevated in aged mice and human cells, and that this elevation is regulated by telomerase RNA. We also found that telomerase activity is elevated in aged mice and human cells, and that this elevation is regulated by telomerase RNA. We also found that telomerase activity is elevated in aged mice and human cells, and that this elevation is regulated by telomerase RNA.







Folklórna skupina BEZANKA

