Bridges in Life Sciences 8th Annual Scientific Conference
"Laugh and Be the Best in Research and Patient Care" ™

RECOOP HST ASSOCIATION

Hotel ILF Prague
April 5–7, 2013
RECOOP HST Association

Association for Regional Cooperation in the Fields of Health, Science and Technology

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Visegrad Fund

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Cedars-Sinai Medical Center, Los Angeles, California, USA

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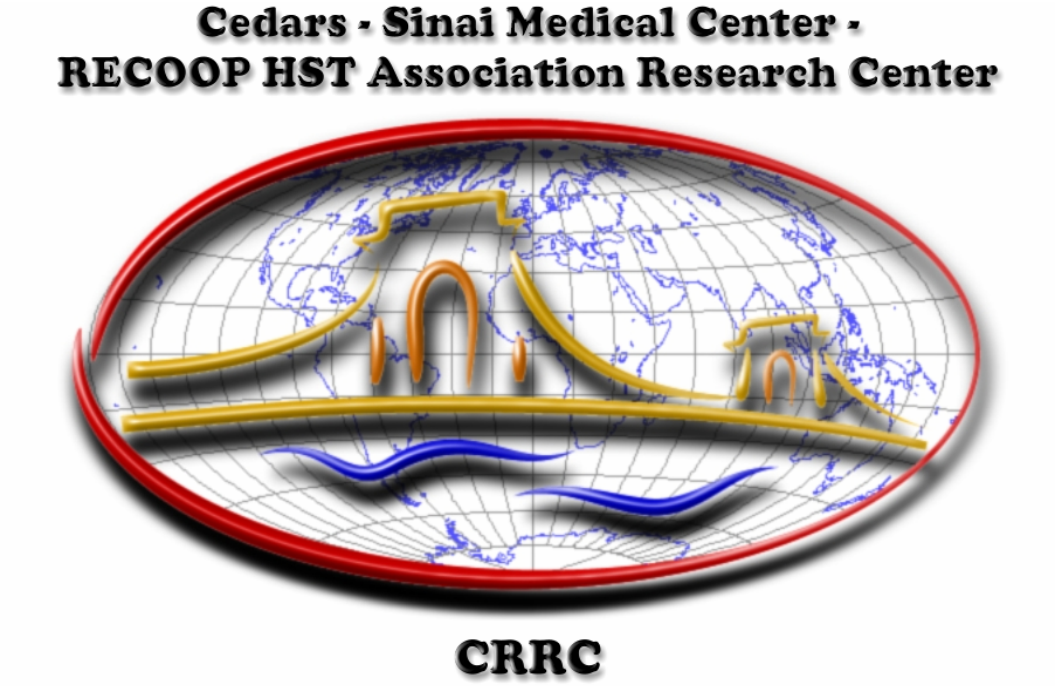
Center for Experimental Medicine – IKEM, Prague, Czech Republic



In 2012 the RECOOP HST Association is integrated the multidisciplinary, multicenter research studies of the RECOOP Research Networks in the RECOOP Life Science Research Platform and formed 17 **CSMC RECOOP Research Centers (CRRC)** from 7 countries (Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic, and Ukraine) working on translational and clinical research in the field of Genomics – Proteomics, Epigenetics, Metagenomics, Molecular Biology, Metabolomics and Nano-biotechnology.

Poster Sessions

Partner Organizations

Poster Session Schedule

18:00 – 20:00 **Poster Sessions -** ***Conference Rooms # 4 and 5***
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Preterm Birth
Cardiovascular Diseases

11:30 – 14:00 **Poster Sessions -** ***Conference Room # 6***
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Cancer Research
NanoBioTechnology

11:00 – 12:00 **Poster Sessions –** ***Conference Rooms # 7***
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Stress, Obesity and Metabolic Diseases
Neurological Disorders and Brain Research

Poster Sessions

Stress, Obesity and Metabolic Diseases

Beneficial effects of melatonin and plant flavonoids on hepatic cell energetic during chronic and acute liver damage

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This study provides further information about the mechanism(s) of liver mitochondrial injury induced by the known hepatotoxic agent, CCl_4, and about the efficacy of the antioxidant melatonin and cranberry flavonoids in reducing the hepatotoxicity.

Multiple events, including considerable mitochondrial ultrastructure impairments, inhibition of mitochondrial enzymes (enzymes of electron-transport chain and antioxidative defense), protein modification (GSSP formation) and lipid peroxidation due to free radical attack contribute to development of liver damage and dysfunction during chronic and acute CCl_4 intoxication. We found that acute intoxication of rats (0.8 g/kg) resulted in considerable impairments of respiratory function of rat liver mitochondria without alterations in the GSH level, the high-dose acute intoxication (4.0 g/kg) led to complete uncoupling of respiration and phosphorylation, the loss of respiration control in rat liver mitochondria and decrease of mitochondrial GSH level. In the case of acute intoxication, the level of plasma nitric oxide increased and melatonin administration decreased NO level under intoxication. After 30 days of chronic CCl_4 intoxication, the functional parameters of mitochondria were similar to the control values, despite the considerable changes in redox-balance of mitochondria (rise of the mitochondrial levels of GSH, or GSSP, inhibition of mitochondrial glutathione peroxidase or succinate dehydrogenase) and mitochondrial morphology damage.

Long-term melatonin administration prevented markedly mitochondrial membrane damage and enhanced regenerative processes in the liver. Histopathological examination confirmed the hepatoprotective effects of melatonin and its combination with succinate and cranberry flavonoids. The hepatoprotective effect of melatonin is due to antioxidant, membrane-stabilizing and anti-inflammatory properties. The synergistic action of melatonin, succinate and plant polyphenols may be useful for clinical application.

Key words: mitochondrial dysfunction, liver, intoxication, melatonin, flavonoids