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### MEETING ABSTRACT

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#### **RGD as the putative neuronal activity centre of oligopeptide lunasin**

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Lunasin, a 43 amino acid residues-containing peptide (SKWQHQQD SCRKQKQGVNLTPEKHIMEKIQGRGDDDDDDDD) isolated from different plants (mostly soybeans and cereals), has been described as an anti-cancer, anti-inflammatory, cholesterol-lowering and anti-oxidant agent [1]. We have shown for the first time that synthetic lunasin, administered intracisternally in mice, possesses central activity demonstrating anti-dopamine effects in behaviour tests, thus indicating its potential anti-schizophrenic action [2]. Taking into account that schizophrenia is directly related to impairments also in other neurotransmitter systems, at least such as serotonin (5-HT)- and glutamatergic, the present study was focused on examination why and how lunasin may influence these systems by use of specific receptor agonists or antagonists. Moreover, we compared lunasin effects with those induced by its short fragment 33–35 (RGD), which is considered as a cell adhesion motif [1].

In this study we examined peptide effects on locomotor activity after their intranasal administration in ICR mice. Afterwards, the content of neurotransmitters and their metabolites were assessed by ultra-high performance liquid chromatography time-of-flight mass spectrometry (UHPLC-TOF-MS) method in the whole mice brain.

The obtained data demonstrated: (1) intranasal lunasin (1 nmol/mouse) and RGD (1 and 10 nmol/mouse) caused similar anti-dopamine effects (reduction of amphetamine hyperactivity); (2) RGD (10 nmol/mouse) and lunasin (1 nmol/mouse) likewise decreased hyperlocomotion caused by the 5-HT<sub>2A/C</sub> agonist DOI, whereas they did not change glutamate receptor antagonist PCP effects; (3) neurochemical assessment showed that both peptides in a similar manner decreased elevation in contents of DA, NA, 5-HT, 5-HIAA, HVA caused by amphetamine. Peptides also reduced DOI-induced elevation of 5-HT and 5-HIAA content, and increased NA level after DOI injection.

In conclusion, lunasin and its fragment RGD influence not only the dopamine system, but also serotonergic pathways. The present data indicate that RGD may play a putative role as the active centre of lunasin central effects. These findings open new vistas in future studies of these peptides as novel anti-schizophrenic agents.

**Keywords:** lunasin – RGD – 5-HT receptors – DOI

#### **References**

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