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## Proteomic analysis of brain proteins in a rat model of chronic Post Ischemia Pain (CPIP model)

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**Background & Aim:** Complex regional pain syndrome (CRPS) is a rare but debilitating pain disorder. Although the exact pathophysiology of CRPS is not fully understood, central and peripheral mechanism might be involved in the development of this disorder. To reveal the central mechanism of CRPS, we conducted a proteomic analysis of rat cerebrum using the chronic post-ischemia pain (CPIP) model, a novel experimental model of CRPS.

**Materials & Methods:** After generating the CPIP animal model, we performed a proteomic analysis of the rat cerebrum using a multidimensional protein identification technology and screened the proteins differentially expressed between the CPIP and control groups. Based on these findings, we conducted confirmation study and determined calmodulin (CaM) and Ca<sup>2+</sup>/CaM kinase II (CaMKII) protein expression by Western blotting.

**Results:** A total of 155 proteins were differentially expressed between the CPIP and control groups: 125 increased and 30 decreased; expressions of proteins related to cell signaling, synaptic plasticity, regulation of cell proliferation and cytoskeletal formation were increased in the CPIP group. The expression of CaM (P=0.058), cereblon (P=0.007) and neuroserpin (P=0.070) were decreased in CPIP group.

**Conclusion:** Altered expression of cerebral proteins in the CPIP model indicates cerebral involvement in the pathogenesis of CRPS. Further study is required to elucidate the roles of these proteins in the development and maintenance of CRPS.

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## Screening diagnostics of human health using the IT-technologies is the base of preventive medicine

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On the basis of modern IT technologies, we have developed the computer versions of programs for screening diagnostics of physical and mental health of all subjects of the educational process (pupils, students, teachers, athletes). According to the experts, there are no similar electronic passports of health in one country of the world. These programs allow to provide personal quantitative assessment of the level of physical health based on anthropometric and physiometric parameters; the level of physical fitness; the mental status and neurodynamic processes of the central nervous system; the psychophysiological and personal properties defining a probability of a professional route choice and the characteristic of the educational institution conditions influencing the health of all involved humans. On the basis of received findings the integral personal characteristics, so called the electronic passport of health, is automatically formed, all parameters which are compared with the age and sex standards for this region. These data are reserved in the database that allows to comparing the results in the dynamics of surveys, between separate groups, institutions, regions, etc. The advantages of these electronic passports of physical and mental health are the ability to make quick and inexpensive diagnosis of human status, to involve the subject itself in the process of diagnosis, to control and monitoring their personal results in the development dynamics, to find out the different health disorders at the early stages and therefore, to get expert advice and timely correction of the revealed deviations start. These programs can be used on CD as well on-line. The electronic passports of health were supported by the regional administration and were implemented in 123 schools of the Novosibirsk region and 13 higher educational institutions of the Siberian region, about 100000 students of different ages were surveyed.

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