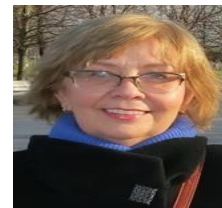


## **The technology for creating complex analgesic and antipruritic therapies on the basis of understanding of drugs' action mechanisms: *in silico* – *in vitro* – *in vivo***

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### **Abstract**

Chronic pain and itch accompanies many pathological conditions, such as diabetes, chronic renal failure, and cancer. Clinical observations have shown that patients with chronic neuropathic pain or itch exhibit symptoms of increased anxiety, depression and cognitive impairment. Such patients need corrective therapy with antidepressants, antipsychotics or anticonvulsants. It is known that some psychotropic drugs are also effective for the treatment of neuropathic pain and pruritus syndromes due to interaction with the secondary molecular targets.

We have created the technology for searching effective drugs among antidepressants, anticonvulsants and antipsychotics, which is based on the prescreening procedures by the structural selection criteria using methods of molecular modeling and the electrophysiological studies of the mechanisms of their interaction with secondary molecular targets involved in pain and itching relief pathways.

Using the technology, we have been able to identify a number of drugs among psychotropics having analgesic and antipruritic efficacies and clinically confirm their effectiveness. We have developed and introduced into clinical practice the adjuvant analgesic and antipruritic therapies for patients with diabetes mellitus and with chronic renal failure.

### **Recent Publications:**

1. Belinskaia DA, Belinskaia MA<sup>2</sup>, Barygin OI, Vanchakova NP, Shestakova NN. Psychotropic Drugs for the Management of Chronic Pain and Itch // *Pharmaceuticals*. (Basel). 2019 Jun 24;12(2).

Barygin, Nagaeva, Tikhonov, Belinskaya, Vanchakova, Shestakova Inhibition of the NMDA and AMPA receptor channels by antidepressants and antipsychotics. // *Brain Research*. 2017. V. 1660. P. 58–66.

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### **Biography**

Dr. Natalya Shestakova is a senior researcher at the Sechenov Institute of Evolutionary Physiology and Biochemistry Russian Academy of Sciences and has 20 years of experience in leading research teams in the field of study on the mechanisms of neuropathic pain and itching syndromes management. She is the author of more than 50 publications and patents in the field of molecular modeling, pharmacology, biochemistry, and physiology. Under her leadership, the adjuvant therapies have been created and have clinical use for patients with diabetes mellitus and chronic renal failure, suffering from neuropathic pain and itching.

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