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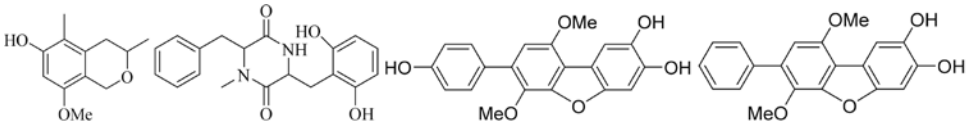
Neuroprotection activity of marine fungi metabolites in toxin-induced model of Parkinson's disease

Key words: marine fungi metabolites, neuroprotection, Parkinson's disease

Currently, Parkinson's disease is the most common neurodegenerative disease after Alzheimer's disease and no less socially significant disease, regardless of countries and regions, and requires an intensive search for new drugs that can prevent or contain the development of Parkinson's disease. Some metabolites of marine fungi show a neuroprotective effect in the in vitro models of Parkinson's disease. Thus, neoequinulin A, a known metabolite of a number of fungi of the genera *Aspergillus* and *Eurotium*, reduced the neurotoxicity of rotenone and 1-methyl-4-phenylpyridinium for PC12 cells [1].

The aim of our work was investigation of a number of metabolites isolated from the marine fungi *Aspergillus candidus* KMM 4676, *Eurotium niveoglaucum*, *Aspergillus flocculosus* and *Penicillium* sp. KMM 4672 in 6-hydroxidopamine-induced model of Parkinson's disease. Totally, the neuroprotective activity of 41 marine fungi metabolites was studied. Neuroblastoma Neuro2a line cells (1×103 cells/well) were treated with 50 μM of 6-hydroxydopamine (6-OHDA) during 1 h, after that neuroblastoma cells were cultivated with each investigated compound (10 μM) during 24 h. In other experiments, the substances were added to the cells 1 h before the addition of the neurotoxin. Viability of cells was measured by MTT assay.

Isochromene 1 [3] statistically significant increased the neuroblastoma cell viability on 11% (1h before 6-OHDA adding) and 14% (1h after 6-OHDA adding) compared with 6-OHDA-treated cells. Mactanamide 2 [2] increased the neuroblastoma cell viability on 18% compared with 6-OHDA-treated cells regardless of the time of substance addition. When the concentration of 2 was reduced tenfold this neuroprotective effect was preserved. Candidusine A 3 had no effect on viability of 6-OHDA-treated cells but its 4″-dehydroxylated analoque 4 [4] increased cell viability on more than 30% (1h before 6-OHDA adding) and 29% (1h after 6-OHDA adding).



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Thus, same marine fungal metabolites protect neuronal cells from damaging effect of 6-hydroxydopamine.

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