POSTER SESSIONS (addition)

P-2-9 Aroma oils have an effect on the gene expression of enzymes that synthesize neurotransmitters

K. Hiwatashi, S. Monden, T. Ohtuka, S. Fue, K. Matsui, K. Miura, O. Hosomi
School of Health and Sports Science, Juntendo University

We studied the influences of aroma oils which were added directly to the medium of the cultured cells with regard to proliferation and gene expressions of neurotransmitter synthesizing enzymes.Several kinds of aroma oils of natural origin were added to the medium of the cultured cell line (PC-12, Pheochromocytoma Cell Line). Adding aroma oils to the cell culture (1ppm), the cell proliferation was increasingly influenced by each of the aroma oils tested. On the other hand, the gene expressions of the enzyme proteins that synthesized neurotransmitters (dopamine and noradrenaline) were up regulated to about 1.5-6 times comparison with those of the control. Especially, black pepper and rosemary oils accelerated the gene expression of DOPA decarboxylase, and four aroma oils (rosemary, grapefruit, lavender, peppermint) also did this for dopamine ā-hydroxylase. However, neither lavender nor peppermint oils were effective on the DOPA decarboxylase gene. Furthermore, we examined the gene expression of the serotonin synthesizing enzyme, but its gene was not detected by PCR method. In conclusion, there are differences in the affects of the action on the gene expression depending on the kind of aroma oils.

P-2-10 Enzymatic synthesis of a novel oligosaccharide by the reverse reaction of α-galactosidase and its physiological role(s)

O. Hosomi,Y. Misawa, Y. Matahira, Y. Naraoka, K. Ikeda, F. Yamakura
School of Health and Sports Science, Juntendo University, Yaizu-Suisankagaku Co., LTD., School of Health Care and Nursing, Juntendo University

The novel oligosaccharide (disaccharide, Galα1-6GlcNH$_2$) was synthesized by the reverse reaction of α-galactosidase from *Penicillium funiculosum* in 5.4% yield using melibiose (Mel) and glucosamine (GlcNH$_2$) as sugar donor and receptor, respectively. The complete structure of the synthesized oligosaccharide was investigated by detailed NMR method. This oligosaccharide has not yet been found in the natural world, and has not been synthesized by anyone except us. We showed that this novel oligosaccharide had suppressive activity against the proliferation of the human brain metastasis neuroblastoma (KP-N-NS). Moreover, the cancer cell proliferation decreased obviously more than that in the case of adding glucosamine (GlcNH$_2$) to the culture cell system, and the suppressive activity of this oligosaccharide was similar to the case previously observed in regard to other cancer cells, human leukemia K562 cells, described previously. We determined that the Mel/MelNH$_2$ binding protein is the hnRNP A1 isoform by LC-MS/MS analysis and immunological method, and that this protein had an apparent molecular mass of 30.8 kDa on SDS-PAGE. Moreover, the hnRNP protein is predicted to have a very closely related motif and to bind oligosaccharide (*e.g.* lactose) as well as oligonucleotide.It was shown that the hnRNP was shuttling between the nucleus and the cytoplasm.

On the other hand, on the cell surface the oligosaccharide receptor was predicted to galectin-1 molecule. Recently, it was reported that galactomannan whose backbone is composed of β1-4 linked D-mannopyranosyl units to which single D-galactopyranosyl residues was periodically attached via α1-6linkage. The galactomannan binding domain covers a relatively large area on the galectin-1 surface that run across the dimer interface on the opposite side to the lactose binding site.