

Based on the recent papers on identification of key odorants of food products it has been concluded that no more than 226 compounds contribute to their specific smell, consequently they define the stimulus space of most of our food and beverages (Dunkel et al. 2014). Therefore it can be assumed that it might be possible to compose any food flavor based on the specific mixtures of those key odorants. Consumers interest in natural products leads into substitution of synthetic aroma compounds by natural ones, obtained through microbial biosynthesis or bioconversion. Consequently the biotechnological process can be guided into reconstitution of food odors characterized by the known key odorants. Thus by the proper choice of microorganisms, substrates, flavor precursor and controlled culturing an aroma of any given food product may be biosynthesized.

The main objective of this research is to bring basic knowledge about influence of specified nutrition's and culturing conditions on flavor development during fermentation of buttermilk and whey broths by *Galactomyces geotrichum* mold. *G. geotrichum* has been isolated from a polish traditional fried cottage cheese and has been proved to have the ability to produce powerful flavor compounds with rosy, honey-like or caramel odor. The huge interest in biotechnological production is due to the fact that flavor compounds produced from natural raw materials by microbial or enzymatic methods can be labeled 'natural' in accordance with European and US legislation (Berger 2009). Nowadays, biotechnological production of flavor compounds is a mature discipline in the chemical industry, with an estimated 100 molecules in the market produced by enzymatic or microbial processes.

Proposed research is aiming at identification of metabolic pathways of flavor compounds formation through biochemical conversions of precursor molecules which might be used in the future for controlled bioengineered production to generate desired compositions of food aromas. Additionally the use of readily available by-products of the food industry (buttermilk, whey) into conversion of high value aroma compositions may be of another asset to this project.

Dunkel A., Steinhaus M., Kotthoff M., Nowak B., Krautwurst D., Schieberle P., Hofmann T. Nature's Chemical Signatures in Human Olfaction: A Foodborne Perspective for Future Biotechnology. *Angewandte Chemie International Edition*, 2014, 53, 28, 7124–7143.

Berger R.G. Biotechnology of flavours – the next generation. *Biotechnol. Lett.*, 2009, 31, 1651-1659.