

Creation of Bioactive Substances by Utilizing Structural Diversity of Fatty Acids

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There are scattered reports that fatty acids have different effects on ω -3 and ω -6; supplements of DHA and EPA, which are ω -3 fatty acids, are available, but not so often for ARA, which is an ω -6 fatty acid. Fatty acids have a high degree of structural diversity in terms of the total number of carbons, the number of double bonds, the position of the double bonds, and the geometric isomerism of the carbon-carbon double bonds, since they usually contain Z-olefines also E-olefines. The structural diversity of fatty acids not only refers to the diversity of molecular formulae due to geometric isomerism and differences in the number of carbons, but also refers to the fact that there are many conformations of a single fatty acid based on bond rotations. There should be present endogenous ligands that are fatty acids themselves or have fatty acids as substructures, and there are corresponding receptor proteins. It is certain that fatty acids are involved in a part of the signal transduction mechanism in vivo. We studied herein rational design and synthesis of molecules with fixed conformations based on the structure of fatty acids, which will lead to the creation of substances with bioactive functions such as cosmetology and pharmaceutical supplements.