A NOVEL HIGHLY SELECTIVE CHIRAL INDUCTION UTILIZING A FUNCTIONAL HETEROCYCLIC COMPOUND, 4(R)-MCTT

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So far, we have developed new reactions utilizing a functional heterocyclic compound, 3-acyl-1,3-thiazolidine-2-thione (ATT) (1) and applied them to the total synthesis of spermidine-containing natural products.

Very recently, we established a novel and useful nonenzymatic procedure for a highly selective transformation of enantiotopic groups attached to a prochiral center in a symmetrical molecule, 3-methylglutaric acid (3) (Scheme 2). We also proposed a new concept that the introduction of same two chiral ligands, *e. g.*, two 4(R)-MCTT groups, into the prochiral ligands of a symmetrical molecule having a prochiral center changes its original symmetrical nature (environment) into the unsymmetrical nature (environment). This novel concept should be widely applicable not only to other similar compounds having a prochiral center but also to the *meso* compounds.

Now, we suceeded in an extremely stereoselective differentiation between two identical groups in *meso*-2,4-dimethylglutaric acid (4). The overall sequence is illustrated in Scheme 4. The products 18 ∿ 20 and 22 derived from 16 or 17, should be useful as "bifunctional chiral synthon" for total synthesis of the optically active Prelog-Djerassi lactonic acid, methynolide, 6-deoxy-erythronolide B, pikromycin, narbomycin, and monensin.

Furthermore, we are extending this new method to the highly selective discrimination of two identical carboxyl groups of cis-1,2-cyclohexanediacetic acid (5).