The Soai Reaction: The Origin of Asymmetry-Amplifying Autocatalysis

Proposed mechanism:

Selected examples:

Significance: In 1995, Soai and co-workers reported an autocatalyzed, asymmetric alkylation of pyrimidine-5-carbaldehydes employing dialkylzinc reagents and catalytic amounts of scalemic product pyrimidyl alkanols. The transformation furnishes the enantioenriched alkylated products, hence establishing the concept of chiral amplification. This phenomenon contributed to the understanding of the origin of biological homochirality.