

The Origin of Homochirality in Amino Acids and Sugars on Prebiotic Earth

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For life to start it was necessary that the amino acids and sugars that are the building blocks of biology be present in essentially homochiral form, on our planet as the L amino acids and D sugars. There has been much speculation about how simple chemistry could lead to such preferential handedness, but recently new findings in chemicals delivered by some meteorites offer a clue to a scenario that can explain a possible way for this to occur. In this lecture I will describe how meteoritic special amino acids can form normal amino acids with an L preference, and how that preference can be amplified, all under credible prebiotic conditions. I will also show that the formation of D sugars can be explained by selective catalysis with the L amino acids, and again with amplification under prebiotic conditions. I will also describe the likely origin of the amino acids that are delivered by meteorites.