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Based on the hydrothermal sediment samples in the extreme environment to study the origin of lifeHaiyan Wang¹, Daxiong Han^{2*}, Yufen Zhao²¹Third Institute of Oceanography, State Oceanic Administration of China, Xiamen, China,²Department of Pharmacy, Medical College of Xiamen University, Xiamen, China

*daxiong@xmu.edu.cn

Introduction: In the present study, we combined theoretical and experimental methods to investigate the research. we demonstrate that amino-acid homochirality, as a unique feature of life, might have originated synchronously with the Genetic Code. And the emergence of phosphoryl amino-acid 5'-nucleosides having a P-N bond is described as a model of the origin of amino-acid homochirality and Genetic Code. Based on our calculations, the chiral selection of the earliest amino-acids for L-enantiomers seems to be determined by a clear stereochemical /physicochemical relationship. As later amino-acids developed from the earliest amino-acids, we deduce that the chirality of these late amino-acids was inherited from that of the early amino-acids[1,2,3]. This idea reaches far back into evolution, and it should be further verified. Thus, in this study, we analyzed the organic components of two hydrothermal sediment samples (TMG-11 and TVG-6) in the extreme environment through LC-MS. The samples were collected in the site located in Pacific Ocean and Indian Ocean on 19th Oct, 2007, the first Global Oceanic Scientific Expedition of China. Then we determined the phosphorous concentrations through ICP-MS and traditional chemical methods-Phosphorus molybdenum blue method. The experimental results demonstrated that there indeed existed some degree of phosphorous material in the samples. And we analyzed the hydrothermal materials through SEM. In addition, combining with molecular modeling, we investigated the interaction between amino-acids and nucleotide and explored the chemical basis of the origin.

References:

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