**Scientific report: “Emergence of life in formamide-based origin scenario”**

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When and where did life begin? and what did the first life forms look like? Questions that man has always posed, for which, despite the absence of definitive answers, some hypotheses can be advanced. The question, which became part of science thanks to Oparin's theory, produced the first response in the birth of prebiotic chemistry. Present day, the chemistry of formamide represents a robust prebiotic model to explain the origin of the biomolecules necessary for the emergence of life on our planet or elsewhere in the Universe. In this model, proton irradiation studies carried out in collaboration with the JINR have made possible to clarify fundamental aspects for the synthesis of the most complex components of nucleic acids, nucleosides and nucleotides, highlighting the role that meteorites have played in the mechanisms that control the regio- and stereoselectivity of the transformation. These results are the driving-force for new studies in which the space-like formamide prebiotic chemistry is translated into geochemical models of the primitive Earth, linking the role of radiation to the birth of the pristine compartmentalization of the cell.