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Synthesis of Glycine and Other Prebiotic Compounds in the Interstellar Medium - An Example of Radiation Chemistry.

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To understand how life can begin on a habitable planet such as the Earth, it is essential to know what organic compounds were likely to have been available, and how they interacted with the planetary environment. Therefore an understanding of the mechanisms by which organic chemical compounds are formed (so called /prebiotic chemistry/) is essential. Recent data from space based telescopes are revealing the interstellar medium as a rich 'chemical factory' in which many hydrocarbon speices are present (e.g. formic and acetic acid, alcohols and esters). Whether larger more complex species such as amino acids can form remains unknown since they can not, at present, be detected. However laboratory experiments that recreate the conditions of the ISM and the conditions under which stars and planets evolve have recently shown that such 'prebiotic compounds' may be formed through radiation induced chemistry. Details of these experiments will be discussed with the example of glycine formation used as an exemplar for such molecular synthesis.