

Phosphorylation of prebiotic precursors

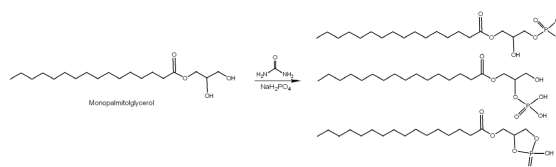
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Phosphorus is an essential element for biomolecules such as nucleic acids, the energy-carrying molecule ATP and phospholipids [1]. Their formation includes a mandatory phosphorylation step, that requires a condensing agent like plausibly prebiotic urea for the phosphorylation reactions to be reasonably efficient under ambient pressure and temperature [2]. To increase our knowledge on this reaction we tested laboratory methods for obtaining phosphorylation products in dry conditions by varying the phosphorus source, the reaction temperature and using prebiotic alcohols as promising candidates for membranogenic compounds (Fig. 1) [3, 4]. We will present several nitrogen-containing compounds similar to urea that were investigated to obtain the maximum yield of phosphorylated products, while taking into account the possibility of these reactions to occur on the early Earth. The next step is to include natural phosphate minerals, which usually have low solubilities and reactivities under normal conditions, and evaluate their potential for phosphorylation reactions under abiotic conditions [5].

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