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GADV peptide/aggregate synthesis using a hydrothermal simulator at elevated temperature

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GAVD peptide hypothesis was proposed by Ikehara (2009) as a possible alternative that precedes the RNA world hypothesis (Gilbert, 1986) due to many limitations. The hypothesis suggest a very plausible explanation, but has only been experimentally tested by Oba and co workers (2012), in terms of possible peptide formation using heat-drying cycles and their catalytic activities. We would want to examine the formation of GADV aggregates (or peptides) in an simulated hydrothermal system to represent a more realistic prebiotic environment. We have used Gly, L-Asp, L-Asp and L-Val into our Supercritical Water Flow Reactor (SCWFR) at a temperature range of 100-300 Celsius . Our initial results suggest that no visible aggregates (bigger than 0.2micrometer) were seen after the heating of 2 min in the mentioned temperature range. Initial MALDI-TOF-MS are also suggesting that we only obtained a small peaks about m/z 410 within the spectrum lesser what Oba et al (2012) which was 525, 539, 657. Although many hydrothermal simulation experiments has shown the recovery of amino acids (Islam et al 2002; Kohara et al; Kobayashi et al, 1997) and the formation of oligomers (Imai, 1999; Goto et al , 2005) we only believe, that only small aggregation occur and cannot promote bigger oligomers or polymers due to heat and pressure stress. Hence, based on our initial findings, we are very uncertain about the formation of GADV aggregates or peptides in a hydrothermal system if we use free-form amino acids. It would be of interest to investigate the hypothesis by using bound amino acids or amino acid precursors.

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