A New Tool for the Analysis of Prebiotic Peptides

With many missions slated to bring back samples of other bodies in the solar system, we need a powerful tool that can detect a wide range of organic molecules in small abundances. Can a new analytical tool be developed for the rapid and sensitive analysis of peptides (which are combinations of amino acids), which set the stage for the formation of proteins that are vital for the origin of life?

Here at Goddard, we have developed a new, fast (20-minute) technique to analyze a wide range of peptides that were formed under numerous simulated prebiotic environments relevant to the primordial Earth.

This new method allows for reliable abundance determinations that are significantly lower (~10 – 1000 times) than those for previous methods and can detect a much more diverse array of peptides than previous techniques.

The presence of peptides in samples returned by missions such as NASA’s OSIRIS-REx may indicate that prebiotic chemistry in asteroids and meteors contributed to the origin of life on Earth. This new method is a dramatic improvement in the search for these molecules.