

Scientists compile list of potential gases to guide search for life on exoplanets

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A new approach intended to maximize the chances of identifying planets orbiting nearby stars that support life focuses on creating a comprehensive list of the molecules that might be present in the atmospheres of these exoplanets. Biosignature gases emitted by exoplanetary life forms could be detected remotely by space telescopes, but these gases might have quite different compositions from those in Earth's atmosphere, according to an article in *Astrobiology*. The article is available free for download on the *Astrobiology* website until June 5, 2016.

S. Seager, W. Bains, and J.J. Petkowski, MIT (Cambridge, MA) and Rufus Scientific (Cambridge, U.K.), propose that all stable and potential volatile molecules should be considered as possible biosignature gases. In the article "Toward a List of Molecules as Potential Biosignature Gases for the Search for Life on Exoplanets and Applications to Terrestrial Biochemistry," the researchers laid the groundwork for identifying such gases by conducting a massive search for molecules with six or fewer non-hydrogen atoms. They describe how this exhaustive list of [small molecules](#) can help enhance our understanding of the limits of biochemistry on Earth.

"This work reminds me of Darwin's voyage aboard The Beagle, exploring the vast diversity of life by sailing around the world," says Nancy Y. Kiang, PhD, Senior Editor of *Astrobiology* and a scientist at NASA Goddard Institute for Space Studies. "In the search for life beyond our planet, we are currently at a similarly exciting, early but

rapidly evolving stage of exploration as the discovery of [exoplanets](#) accelerates. Instead of netting strange creatures from the bottom of the sea, the authors here have searched and found thousands of curious, potentially biogenic gas molecules. These will inspire a new body of research into identifying also larger [molecules](#), investigating their origin and fate here, and their potential expression on exoplanets as signs of [life](#)."

More information: S. Seager et al, Toward a List of Molecules as Potential Biosignature Gases for the Search for Life on Exoplanets and Applications to Terrestrial Biochemistry, *Astrobiology* (2016). [DOI: 10.1089/ast.2015.1404](#)

Provided by Mary Ann Liebert, Inc

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