

Life on Earth is carbon-based — but on other planets, could life be built out on other chemical building blocks, like silicon?

When we search for life on other planets, what we usually mean is that we are looking for life *as we know it* — [life based on carbon, which requires liquid water](#) and uses light or chemicals as its energy source. This makes sense when searching for life on a (fairly) Earth-like planet like Mars. But does it make sense for other planetary bodies, especially those outside of our Solar System?

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On Earth, it wouldn't work to replace carbon with silicon as an ingredient of life. The realities of biochemistry on our planet wouldn't allow it. Elemental silicon would be quickly and furiously oxidized into silicates (rocks) when exposed to atmospheric oxygen

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Ironically, Earth is a silicon-rich planet. So if there's no chance for silicon-based life on Earth, wouldn't that disqualify other planets like our own? Not necessarily. A prerequisite for silicon-based life is that an exoplanet or exomoon not have significant amounts of free oxygen or liquid water. In that case, organic silicon compounds could exist. In such an environment, silane (SiH_4) could replace methane (CH_4). So-called polysilanes (compounds with multiple SiH_4 groups) could be the start of an alternative biochemistry.

[This is an excerpt. Read the original post here](#)