

# Ice Cores as a Repository of Ancient Oceanic Cyanobacteria that Contain a Frozen Record of Microbial Evolution

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Oxygen-producing cyanobacteria originated on Earth around two billion years ago. Two genera of oceanic submicrometer-size cells – the *Synechococcus* and the *Prochlorococcus* – account for as much as half of the air that we breathe. Winds transport them from polar oceans onto Arctic and Antarctic glacial ice. We find that they are present in the glacial ice at all seven sites and all depths we have examined. Advances in biology instrumentation, especially in single-cell genomics, may enable us to decipher the record of their molecular evolution over millions of generations by nondestructively extracting them from future cores of ice samples more than 150,000 years old at South Pole and other polar sites.

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