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Molecular Analysis of Microbial Communities inhabiting Subglacial Lake Whillans, Antarctica

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A complex hydrologic system consisting of lakes, streams, and water saturated sediments exists beneath the Antarctic Ice Sheet. Although subglacial aquatic environments are hypothesized to harbor active microbial communities, direct sampling of these potential ecosystems has been lacking. During January 2013, the Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) Project created a ~800 m borehole to access Subglacial Lake Whillans (SLW) and collected water and sediment samples. The biotic and abiotic particulates larger than 10, 3, and 0.2 µm were fractionated and concentrated *in situ* on 142 mm filters using a custom filtration device that was lowered into the lake. In addition, the upper 40 cm of lake sediments were retrieved and sampled at 2 cm intervals. Nucleic acids were extracted from the samples and phylogenetic analysis based on the V4 region of the 16S rRNA gene was used to characterize the prokaryotic microbial community structure in SLW. The significance of the molecular data for deciphering ecosystem processes in SLW are discussed.

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