



Project acronym: SNOW-BALL

Project title: Mercury concentration and tolerant microorganisms in Arctic SNOW: new Bioremediation chALLENGES

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Discipline: Life Sciences & Biotech: Other - Life Sciences & Biotech

Station(s): CEN Whapmagoostui-Kuujuarapik Research Station (Canada)

The SNOW-BALL research proposal aims at evaluating Hg presence in the Arctic snow surface and the relative difference in Hg forms abundance. The determination of the pollutant concentration and forms will be carried out also along the snow depth profile. Related to this, the bacterial community composition and activity will be also evaluated, using microscopy, DNA probe, and metagenomics analyses. Specific mer gene abundance will also be investigated. The final goal will be the isolation of promising bacterial strains and their genetic and metabolic characterization, which will be useful for future bioremediation action.

The following steps are envisaged:

- 1) Chemical analysis of the concentration of Hg present and evaluation of the different forms of Hg found both in the surface snow and in the depth profile.
- 2) Ecosystem measurements by biological parameters such as viral component, prokaryotic abundance, biomass and activity;
- 3) Molecular detection of the prokaryotic phylogenetic composition and metabolic potential (by the use of next generation sequencing);
- 4) Searching for specific genes of resistance within the natural sample, and comparison of their concentration with the detected Hg concentrations;
- 5) Enrichment cultures with Hg, screening of mercury tolerant bacterial isolates and assessment of their bioremediation potential at low temperatures;
- 6) Comparison of the results with those previously obtained from different sites and matrices in the Northern Hemisphere to achieve advanced knowledge.