# Using a Novel Fluorescent Probe Technique to Study Bacterial Cd Sorption

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## Novel Fluorscent Probe Technique for Quantifying Bacterial Sorbed Cd

We have developed a novel fluorescent probe technique which allows us to quantify the concentration of Cd that is sorbed to a bacterial population, as well as to quantify the concentration of Cd sorbed to individual bacteria, in fully hydrated multi-sorbent samples. We have conducted an extensive suite of control tests that verify that our treatment does not affect the extent of Cd sorption and that the fluorescence response can be correlated to the concentration of Cd that is sorbed to a bacterial cell population (**Figure 1**).

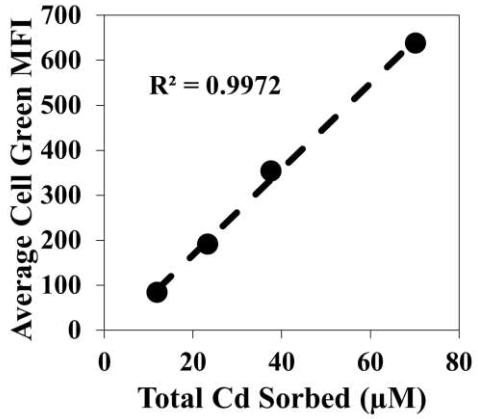


**Figure 1:** Calibration curves correlating total Cd sorbed in a 10 g/L bacterial suspension to the measured average cell green MFI.

## Fluorscent Probe Technique Applications

Our prelimnary results document a high degree of heterogeneity in the concentration of Cd sorbed onto individual cells in a population, and in this presentation we report results of an investigation of the effect of growth phase on the degree of heterogeneity. We also use our technique to test the ability of surface complexation modeling to account for the extent of Cd adsorption to bacteria in mixed bacteria-mineral systems. Our study describes a relatively straightforward and novel means for quantifying the distribution of adsorbed Cd in realistic geologic samples.