

Impact of Geological Carbon Sequestration on Subsurface Biomass

Scientific Achievement

Biological experiments demonstrate that microbial biofilm can continue to clog porous media following acidification of groundwater even if significant cell death occurs

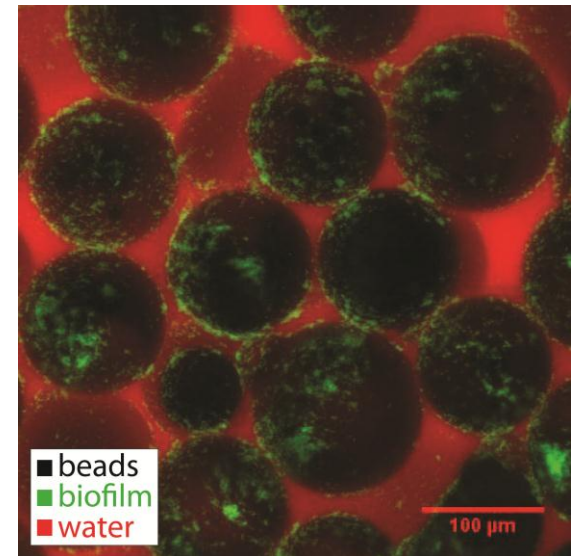
Significance and Impact

Promotes development of biological strategies to enhance geological carbon sequestration by clogging CO₂ leakage pathways

Research Details

- After CO₂ is injected into the subsurface, it will dissolved into the water present in storage reservoirs and cause the water to become more acidic
- Our experiments demonstrate that this acidification causes cell death and stress but has little impact on the ability of biofilm to lower the permeability of porous media
- These results imply that stimulating growth of biofilm barriers in reservoir caprocks can be an effective strategy to limit leakage of CO₂

Kirk, M.F., Santillan, E.F.U., McGrath, L.K., Altman, S.J. (accepted) International Journal of Greenhouse Gas Control



Laser scanning confocal image showing growth of biofilm in porous medium during one of our experiments



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