

# MRB NEWS

## Featured Faculty: Jennifer Roberts, Assistant Professor, Geology

### Academic Areas:

Geomicrobiology, Organic Aqueous Geochemistry

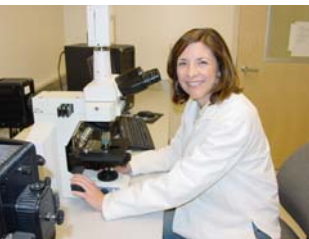
### Research Interests

Research includes microbial weathering of silicates, mineralogical controls on microbial attachment and transport through porous media, biochemistry of microbial production and utilization of iron and copper-chelating ligands, and the precipitation of dolomite at low-temperature.

### Educational

#### Background:

Ph.D., University of Texas, 2000., B.S., Geology, Trinity University in San Antonio, Texas, 1995, cum laude.



Photos: Jennifer Roberts with Ezra Kulczycki left and Paul Kenward right, both Graduate Research Assistants.

Article reprint KU Geology website

The Roberts Lab focuses broadly on microbe:mineral interactions and the geological and ecological implications of these interactions in subsurface environments.

Jennifer's program currently has three separate but interrelated thrusts--microbial attachment to mineral surfaces; nutrient-driven microbial silicate weathering, and low temperature-dolomite precipitation.

### **The role of mineral composition in microbial attachment to silicates**

Robert's Lab finds that mineralogical heterogeneity on the microscale can impact where microorganisms attach and colonize. Microbial attachment is a fundamental process in initiating a cascade of metabolic and weathering reactions and is also a potential means of sequestering pathogenic organisms in groundwater systems. They are currently investigating the role of silicate composition in microbial attachment.

### **Minerals as microbial habitats**

The second research area investigates the interaction between mineral composition, mineral weathering, and microbial biodiversity in a variety of

shallow groundwater ecosystems, including soils (Barro Colorado Island, Panama <http://www.stri.org/>), aquifers (USGS Toxic Substances Site <http://mn.water.usgs.gov/bemidji/>), and wetlands (Lost River Bog <http://www.dnr.state.mn.us/snas/sna02003/index.html>). "My broad guiding hypothesis is that composition of the mineral phase controls weathering reactions by releasing either essential nutrients or toxic metals and these processes may serve as positive or negative feedbacks to weathering but may also influence the biodiversity and population succession of the surface colonizing microbial population," says Roberts.

### **Low-temperature dolomite precipitation by methanogens**

The third area of research is a recent expansion into the area of biomineralization. "In particular, I am investigating the role of methanogenic microbial metabolism and cell wall structure on the nucleation and precipitation of ordered dolomite at low temperature. I have been successful at precipitating ordered dolomite in the laboratory in

methanogenic, dilute groundwater at conditions that are near equilibrium with respect to dolomite and at Mg:Ca ratios <1. These results bring us one step closer to understanding this notoriously difficult mineral and we continue to pursue this area of research in both the laboratory and the field," says Roberts. In addition, Roberts is working with Luis Gonzalez and Bob Goldstein on a project funded by Shell Oil to investigate the role of microbial activity on carbonate diagenesis using experimental geochemistry.



## MEET THE GRA



**Name:** Phil Livanec  
**Lab Group:** Dunn Lab  
**Field of Study:** Analytical Chemistry  
**Time at KU:** 1.5 years  
**Hobbies:** Woodworking, Hunting and Softball  
**Home Town:** Deer Park, Texas

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**email [mrhelp@ku.edu](mailto:mrhelp@ku.edu)**

### Upcoming Events:

Friday, September 22nd from 4:00—6:00 p.m. you are invited to meet the artists responsible for the first installations of KU Faculty artwork at MRB. They are Shawn Bitters, Matthew Burke and Yoonmi Nam. Refreshments will be served.

## MRB TIDBITS

**A reminder about keys and building access: If you have personnel/students who have building access and lab keys that are leaving MRB please be sure to email admin and collect the lab key.**

*Park and Ride is now operational. We are discontinuing our taxi service. If you'd like to know more about schedules and routes, see Teri.*

Since the MRB lot is patrolled by KU parking services, visitors must park at meters to avoid being ticketed. If you would like to purchase full or half-day permits, see Ann, Carla or Teri

**Welcome Back—  
Go Jayhawks!!!**

*Remember to contact Admin to reserve conference rooms. Now that the semester has begun, the rooms will be getting more use. Please be considerate of other groups and try not to go over your scheduled time, and release the space if you will not be needing it.*

**Since our contractor traffic has decreased, starting Monday, 8/21, the back door to the dock will remain locked. Your KUID card will allow you access. If you need to take out some trash or cardboard recycling, be sure you take your ID with you. Please don't prop the door open.**

**Look forward to another MRB social upcoming in the near future. Details will follow at a later date!**

**FO has contracted with a new exterminating company. They are doing a good job at getting many of the bugs in our building. Keep in mind it will take some time but they are making progress**

If you have a space that requires special janitorial attention, or if you want to leave a message for Craig, Aron, or Traci, email **Den MRB**

*If you happen to notice that the elevator floors don't appear level when the door opens, please take the stairs and notify admin right away!*



Pictured above: Yoonmi Nam installs her artwork in the MRB main office.