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Dr. Pett-Ridge leads LLNL's DOE-BER biofuels SFA and is deputy group leader of the Isotopic Signatures Group. In her research, Pett-Ridge uses the tools of systems biology ('omics, isotope tracing, metabolic modeling) to enhance understanding of energy and nutrient flows in complex communities ranging from microbial mats to rhizosphere soils, marine archaea, co-cultures and tropical soils. Her highly collaborative work is funded by DOE BER's Genomic Sciences program, NSF and the Moore Foundation. Since coming to LLNL in 2005, Pett-Ridge has helped build a diverse and well-funded program in environmental microbiology and biogeochemistry, centered around LLNL's NanoSIMS. The nanoSIMS lab is one of only five groups worldwide focused on biological isotopic imaging. Pett-Ridge and her colleagues have developed several cutting edge isotope-enabled approaches (ChipSIP, FISH-SIMS, SIP-enabled transcriptomics) that are used to study relationships between identity and function in microbial communities that are relevant to biofuel production and marine/ terrestrial carbon cycling. She is also involved in several studies of soil carbon cycling, and along with collaborators at UC Berkeley and LBNL, is working to incorporate a mechanistic understanding of soil organic matter creation, degradation and stabilization—using high-resolution molecular imaging (STXM-SIMS), microbial trait-based modeling and food web modeling-- to improve predictive models of carbon cycling in terrestrial systems. Pett-Ridge is a recognized leader, author, and is frequently invited to speak at national and international conferences (ASM, ISME, Goldschmidt, AGU, Gordon Conferences), biotechnology and microbiology summer courses, and DOE user meetings (JGI, Genomic Sciences). She serves on the editorial board of several well-respected journals, and frequently serves on review panels for the DOE, NSF and USDA. She recently co-chaired a workshop on promoting sustainable biofuel feedstock research at DOE Headquarters. In sum, Pett-Ridge has expertise in both the approaches and questions that the EMSL user community will employ for 'Biosystem Dynamics and Design' and 'Terrestrial and Subsurface Ecosystems', and is an ideal member on EMSL's User Executive Committee.