Ancient medicinal clay shows promise against today's worst bacterial infections

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UBC researchers Julian Davies and Shekooh Behroozian with a bucket of the clay. Credit: University of British Columbia.

Naturally occurring clay from British Columbia, Canada—long used by the region's Heiltsuk First Nation for its healing potential—exhibits

potent antibacterial activity against multidrug-resistant pathogens, according to new research from the University of British Columbia.

The researchers recommend the rare mineral clay be studied as a clinical treatment for serious infections caused by ESKAPE strains of bacteria.

The so-called ESKAPE pathogens—*Enterococcus faecium*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter species*—cause the majority of U.S. hospital infections and effectively 'escape' the effects of antibacterial drugs.

"Infections caused by ESKAPE bacteria are essentially untreatable and contribute to increasing mortality in hospitals," says UBC microbiologist Julian Davies, co-author of the paper published today in the American Society for Microbiology's *mBio* journal.

"After 50 years of over-using and misusing antibiotics, ancient medicinals and other natural mineral-based agents may provide new weapons in the battle against multidrug-resistant pathogens."

The clay deposit is situated on Heiltsuk First Nation's traditional territory, 400 kilometres (250 miles) north of Vancouver, Canada, in a shallow five-acre granite basin. The 400-million kilogram (400,000 tonne) deposit was formed near the end of the last Ice Age, approximately 10,000 years ago.

Kisameet Bay, British Columbia. Credit: University of British Columbia.

Local First Nations people have used the clay for centuries for its therapeutic properties—anecdotal reports cite its effectiveness for ulcerative colitis, duodenal ulcer, arthritis, neuritis, phlebitis, skin irritation, and burns.

"We're fortunate to be able to partner with UBC on this significant research program" says Lawrence Lund, president of Kisameet Glacial Clay, a business formed to market cosmetic and medicinal products derived from the clay. "We hope it will lead to the development of a novel and safe antimicrobial that can be added to the diminished arsenal for the fight against the ESKAPE pathogens and other infection-related

health issues plaguing the planet."

In the in vitro testing conducted by Davies and UBC researcher Shekooh Behroozian, clay suspended in water killed 16 strains of ESKAPE bacteria samples from sources including Vancouver General Hospital, St. Paul's Hospital, and the University of British Columbia's wastewater treatment pilot plant.

Shovel of clay from Kisameet Bay, British Columbia. Credit: University of British Columbia.

More information: Kisameet Clay Exhibits Potent Antibacterial Activity against the ESKAPE Pathogens, *mBio* American Society for Microbiology, January/February 2016 Volume 7 Issue 1 e01842-15

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