Arsenic is a common contaminant of drinking water, originating from several sources such as industrial pollution, certain fertilizers, and underground rocks which contact groundwater. Exposure to arsenic can lead to acute poisoning, blindness, partial paralysis and many types of cancer. Microbial contaminants are source of public health concern in drinking water. Worse yet, water contaminants are extremely difficult to remove even with the use of sophisticated and expensive systems.

Researchers at the University of South Florida developed an efficient, cheap and portable system from natural extracts which were shown to be effective at removing arsenic and bacteria of public health concern such as *Escherichia coli* (E. coli) and *Bacillus cereus* (B. cereus). The new method was found to be more effective than aluminum sulfate (standard in water treatment plants) at removing suspended solid contaminants from water. Removal rates of 95-99% were observed in tests consisting of *E. coli* and *B. cereus*, suspended in surrogate hard and soft waters with a CaCl$_2$ concentration and mucilage treatment.

The newly discovered extract also is effective at removing oil contamination, and can be spun as a fiber. The cost of the extract would also be far lower than any other system capable of arsenic filtration, or microbe treatment, allowing for widespread use across many environments including battlefields, disaster areas, and third world countries.

Advantages:
- Removes arsenic from drinking water using natural cactus extracts
- Removes bacterial contamination from drinking water
- Ideal for portable water treatment kits
- Natural and inexpensive method

Florescent images of samples taken from the bottom of *E. coli* GFP columns treated with A) no flocculation agent (Control 1) B) 20 mM CaCl$_2$ (Control 2) and C) 2 ppm cactus extract (GE) in conjunction with 20 mM CaCl$_2$.

Tech ID#06A004, 10A064, 11A082, 11B123