

The Adventures of Meg A. Mole, Future Chemist

Gary Emmert,
Associate Professor of Chemistry

For Earth Day 2014, I did a little research on drinking water in different cities throughout the US. Unlike many other places around the world, the water in Memphis, TN is clear, fresh-tasting, and has virtually no odor! After reading about that, I decided to visit the hometown of Elvis Presley and Dr. Gary Emmert! Dr. Emmert is an Associate Professor of Chemistry at the University of Memphis.

Dr. Emmert explained how his research helps the drinking water in the city of Memphis. “We develop new electronic devices that help improve the quality of drinking water. These devices tell the water treatment plant operators that the water they are producing is safe to drink by measuring the amounts of certain chemicals used to treat the water and turn it from ‘natural water’ to ‘drinking water.’ For example, we work with town and city water treatment plants to help them understand how to add just the right amount of a water disinfectant, chlorine, to kill harmful microorganisms (that means germs!) but not to add too much and produce harmful chemicals that may make you sick.” He also told me about another cool project, where his team “worked with engineers at NASA to develop devices for monitoring the amounts of disinfectants in the water that astronauts drink on the International Space Station.” Their chemistry is out of this world!

While visiting Dr. Emmert’s laboratory, I met a lot of graduate students. They wore lab coats and safety glasses, and some of them even had on gloves, heavy aprons, and clear plastic facemasks. Dr. Emmert explained it was important for them to wear protective equipment “when they are doing certain dangerous tasks.” In the laboratory, they also use a lot of computers, which serve as the ‘brains’ of the instruments they build, allowing them to record data and make sure everything runs like it should!

Dr. Emmert was very interested in chemistry growing up. He told me about how he “had a chemistry set and he really enjoyed experiments where he could create a color or cause a color to disappear. Even today,” he added, “I use some of that same sort of chemistry in the devices that I design.” Also, he told me about one of his “earliest heroes, Mr. Spock on ‘Star Trek’ ... the science officer!” Dr. Emmert loved how Mr. Spock “could always figure things out to get his team out of trouble, often using a handheld electronic device called a ‘tricorder.’ The tricorder was a make-believe device that could detect



and measure almost anything, and Mr. Spock used it all the time.” As Dr. Emmert got older, he said, “I became an analytical chemist because I wanted to build devices like the tricorder that could help people figure out things that they needed to know.”

Dr. Emmert explained how his work really helps many people. “Having a safe supply of drinking water is important to everyone, on earth or in space. A little over a hundred years ago, one of the most common ways people got sick was by contacting germs through drinking water. Today, the number of people in the developed world who get sick from drinking water is very low. The devices that we have built help make this possible. But the problem of not having a safe supply of drinking water is still a concern in many other parts of the world. So we need to make our devices more portable, cheaper, and easier to operate so we can improve water quality worldwide — and even beyond, as we move out to other planets.”

Personal Profile

FAVORITE COLOR?

Deep blue — like water on a picture of Earth shot from space!

INTERESTING PROJECT YOU WERE A PART OF?

One of my inventions is now a commercially available device used by water treatment plants to analyze water samples. In one location, our device has been operating continuously for about five months and has analyzed over 4200 water samples. Can you imagine working for five months straight without a break?

ACCOMPLISHMENT YOU'RE PROUD OF?

Some of the devices that I have designed have been awarded United States patents, and have been used by water treatment plants to improve water quality.

ABOUT YOUR FAMILY?

I met my wife, Wei, in graduate school. We have two young sons — Noah, who is almost 10 years old, and Ike, who just turned 5. Both of my sons like science and technology as well.

