

# Interview With a Chemist

**Christen Brownlee talks with a chemist whose mission is to save lives in the event of a chemical, biological, or radiological attack.**



PHOTO COURTESY OF ERICK SWARTZ

## **Erick Swartz** Research Scientist for CBIRF

### **What is CBIRF?**

*CBIRF stands for Chemical Biological Incident Response Force. We're part of the United States Marine Corps. If an individual is in trouble, they dial 911 and the police and fire department come. But what happens if those responders are overwhelmed? CBIRF assists the police and fire departments in dealing with a horrific event, like those resulting from bioterrorism or weapons of mass destruction.*

*I've worked as a research scientist for CBIRF for a little over a year. I'm actually a contractor for the military, but not a Marine. I've never served in the military a day of my life! I'm the only individual in CBIRF that has not. I just happened to come into this field. Most people in CBIRF are active-duty military or retired military.*

### **What is CBIRF's job when a disaster strikes?**

*Our mission is to save lives. The idea is to go into a contaminated area and assess the area with equipment that detects chemical or biological contaminants. We're asking ourselves: Which areas are clean and which are contaminated? Once we know the answer, we try to get people out of the contaminated areas safely and swiftly. That may sound simple enough, but the scene could be disastrous. There could be people trapped beneath vehicles or trapped in elevators or under desks.*

*CBIRF has an hour response time. If called, we get all the equipment rounded up and we leave the base in an hour. We have a second response force that's ready to go in 4 hours if one group of responders isn't enough.*

*CBIRF is located just south of Washington, DC. Our main focus is protection of the Capitol. If a disaster happens elsewhere, then we have planes and boats that can get us where we need to be a lot faster than cars would.*

### **Where does your work fit in with CBIRF's mission?**

*If there were a chemical or biological disaster, the Marines can either take me with them as an onsite chemist, or I can stay back in the lab to do some immediate research. I could use the Internet to look up information on the chemicals or biological hazards that are at the disaster site, how dangerous they are to people, and the signs and symptoms of exposure. If I have an idea what chemical or other hazardous sub-*

stance is at work, I can tell the Marines which piece of equipment they might use to detect it.

I also make sure pieces of scientific equipment we use to measure and detect chemicals are maintained and calibrated properly. I train the Marines on how to use the instrumentation that they take down to the contaminated area, and I instruct them on the limitations and capabilities of that gear. I like to satisfy my scientist side by trying to figure out new ways to use the equipment more effectively.

Finally, I train the Marines how to handle hazardous situations. I help create scenarios that deal with weapons of mass destruction in chemical, radiological, or biological situations. The Marines' instruction includes some basic chemistry, a little bit of organic and physical chemistry, and lots of analytical chemistry thrown in.

#### Have you responded to any disasters?

Last year, there was a toxin called ricin that was found in the Senate's mailroom. There were potentially a thousand rooms contaminated with this agent, so we had to send in a large force to clear the area. Our responders had to wear personal protective equipment (PPE), the white outfits that look like space suits. Those can fully protect you from a chemical or biological agent.

I'm trained to respond to incidents in PPE, but during the ricin incident, I needed to stay back in the lab and do research on the toxin. I had to instruct the Marines in how to detect ricin and get it off their PPE, and I served as a resource just in case something else came up.

#### What are you doing the rest of the time, when there's no disaster?

There's no downtime because we're always in training and preparing for the next incident. Some weeks I'm dedicated to teaching the Marines general chemistry, and other times, we have equipment training. It's important to learn how to use our equipment not only in the lab, but in a real disaster situation, when you're wearing PPE. It's not as easy as it looks!

At least once a month, we actually have disaster training for the Marines where they have to deal with casualties—other Marines who play out a disaster scenario. For example, our Marine actors might be coughing or wheezing like they



Erick Swartz and a marine are working on a portable gas chromatograph-mass spectrometer.

have symptoms of massive chlorine gas exposure. My job is to make it as realistic as possible. I feed the Marines all the information they would need to respond to this disaster situation, and they have to make decisions on the fly.

#### What's the best thing about your job? How about the worst?

I absolutely love my job here. The best part is that I'm helping to defend the country in a lifeguard-like fashion so that when something bad does happen, I can help deal with it. The worst part of my job is that I spend a significant amount of time fixing gear, which isn't as exciting as doing real scientific research!

#### How did you get into this job?

I was always interested in science as a kid—I originally wanted to be a marine biologist because I liked swimming and science so much. But when I went to college, I couldn't get into a marine biology course. I took chemistry instead. Then I fell in love with all the instrumentation! I ended up studying atmospheric chemistry and getting a Ph.D. in physical chemistry. When I finished graduate school, I got a postdoctoral fellowship with the EPA studying air pollution. Then September 11th happened. I had about six weeks studying the air around Ground Zero. Helping with the aftermath of that disaster made me a perfect fit for this job.

If you're interested in chemistry now,

## Factoid



Ricin is an extremely toxic protein derived from the castor bean (think castor oil). In a notorious 1978 incident, Bulgarian operatives used a modified umbrella containing a ricin pellet in its tip to inject dissident Georgi Markov. Markov died three days later from just a 0.2-mg dose.

the best way to get a job you love is to continue with your studies. Be curious, ask lots of questions, and learn how to take tests well. In my field, you are tested a lot. When you put on PPE and go into a hazardous environment, it's the biggest test of all! Sometimes, the Marines will complain that the exams we administer are hard—but when you're in a contaminated area, that [situation] will be difficult too. If something terrible does happen, we want to be on our best game. ▲

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