

Freedom4 winner Holly Bowers awarded grant for marine research



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- Holly Bowers



About Holly Bowers

Holly won the Freedom4 device in the Freedom For You grants program. Her research career started in molecular gene therapy in 1996 then switched to harmful algae in 1998. With a doctorate in the field of aquatic ecology and funding towards characterization of harmful algal blooms, Holly is an active member of the Monterey Bay research community.

Challenge

The ability to be able to test algal bloom species dockside or boatside – essentially in the field.

Solution

The Freedom4 device has allowed Holly to perform real-time analysis in the field for different algal bloom species.

Results

Time and resources have been saved by being able to conduct analyses in the field. Holly will be using the device with partners in the region.

When post-doctoral fellow Holly Bowers won the Freedom4 device in the Freedom For You grants program, it had a major impact on her ability to rapidly detect harmful algae.

Toxic and non-toxic – a crucial difference

Holly Bowers, Research Faculty, is conducting research at Moss Landing Marine Labs. In 2015, when she was a post-doctoral fellow with the Monterey Bay Aquarium Research Institute, she was a finalist in the Freedom For You grants program. The program was designed to provide support for remote qPCR projects, with each winner receiving a Freedom4 device.

Harmful algal blooms can include toxic and non-toxic species, so it is important to identify the composition of an algal bloom. Traditionally, samples from a bloom are collected in the field, returned to a lab on shore and then analysed to see which species are present.

“Lots of groups of harmful algae are hard to distinguish under the microscope,” Holly explains. “Morphologically, they look the same. But there are big differences in the amount of toxin they produce. That means you have to conduct some genetic testing to figure out what species you’re looking at. In the past this meant taking the samples back to the lab and doing the testing there, but the Liberty16 and Freedom4 devices allow us to do this dockside, or even on the boat. So we’re able to figure out what species we have, and if they’re harmful, right then. It’s really helpful and it speeds things up a lot.”



Making detections in real-time

Being able to detect the different species of algae in real-time means that Holly and her colleagues can make immediate decisions. “For instance, if one of the species you’ve got is a non-toxic one, then you can save your resources,” Holly says. “You don’t have to grab a bunch of samples and do a bunch of down-stream analysis, only to discover that what you have isn’t toxic after all. It’s a big saver, in time and resources.”

Holly was recently awarded a grant that will enable them to get a whole new range of assays up and running with the Freedom4 device. “It also means we’ll be able to purchase a Liberty16,” says Holly.

Working with Freedom4 and Liberty16

Holly and her colleagues have become very familiar with the Freedom4 and its capabilities. Because of this, they were asked to do some testing with the new Liberty16.

“It was to see if we could transition our assays from one platform to the other,” Holly explains. “It worked really well. The software is basically the same, but with the Liberty16 device you have more wells to work with. That allowed us to do more screening of our cultures.”

“The key benefit of both of them is that you don’t have to be in the lab,” she says. “They’re mobile and flexible and allow you to look at your samples in the field. Other lab-based equipment might be more technical, but for us, for getting a sense of what’s in the field and knowing whether to save resources, both these devices are great for that.”

Benefits for their partners

The Freedom4 device and what it’s able to achieve in terms of real-time PCR testing has meant that Holly and her colleagues will be able to offer analysis to some of their aquaculture partners in the region.

Holly goes on to explain that other organisations they’ve worked with have been impressed with the Freedom4’s capabilities. “That’s opened up a lot of connecting doors for us,” she says. “When we submitted the grant proposal we got a lot of letters of support from people who really want to see this kind of device used.”

Looking ahead

With the grant award, Holly and her colleagues say their testing can move ahead much faster. “I liken it to ‘bedside genetics’ - let’s say we were all suffering from the same thing, but genetically we’re different. So may respond differently to medication. It’s the same with the dockside and boatside testing we can do with Freedom4. We can analyse - and we can diagnose - out there in the field, in real-time.”



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