

An Absorbing Mascot

Some biologists might be taking cartoon characters a little too seriously. For instance, SpongeBob SquarePants took the heat, at a recent international meeting, for misinforming people about marine sponges. Yet, at least one biologist team, at the University of Richmond, appreciates the gap-toothed creature and uses it to their advantage.

Malcolm Hill and his wife and colleague April Hill, both HHMI undergraduate program grantees, rely on marine sponges as a research tool. They view the friendly sponge who lives in a pineapple under the sea as a harmless, if far-fetched, representation that helps engage students.

“Before SpongeBob became a cult classic, the character was a favorite among our students,” says April Hill, a developmental geneticist who studies sponges to understand what DNA humans have in common with these primitive animals.

“Certainly, they’ve taken artistic license,” says Malcolm Hill of the cartoon’s creators. In fact, SpongeBob is the brainchild of a former marine biologist, whose production company is aptly incorporated as United Plankton Pictures. If you watch enough of the Nickelodeon cartoon—which the Hills, parents of three, admit they have—you can detect references to marine biology. Still, April Hill is quick to point out, “Unlike SpongeBob, real sponges don’t have legs, eyes, or a nervous system.”

One question her current research seeks to answer has to do with a set of genes—present in humans, mice, and even fruit flies—that leads to eye formation. “Sponges also have a version of the gene,” she explains. “And yet they don’t have eyes, which begs the question: what is the function of that gene in sponges?”

April credits Malcolm, an evolutionary ecologist, with “recruiting” her to use sponges—considered a common ancestor of all animals—as a model more than a decade ago. In his lab, Malcolm studies how sponges defend themselves against predators. “Sponges produce a lot of nasty chemicals, as do bacteria living in the sponge,” he says. “This is of interest to pharmaceutical companies, which potentially could produce a particular drug for relatively little money if they found a way to grow the symbionts that result in these compounds.”

The Hills spread the word about sponges by mentoring undergraduate scientists. Before her freshman year, Crystal Richardson, 19, was one of nine students chosen to be an HHMI research intern. Richardson shadowed April Hill for a year, learning techniques, and then spent the summer conducting research. “For me, the question of, ‘how did we become what we are today?’ was most interesting,” says Richardson.

Kay Holstien, 21, a senior biology major supported by HHMI for two summers, has been working with April Hill since her freshman year. She found the sense of scientific community fostered by the husband-wife research team to be as infectious as their love of sponges.

“Working in the lab showed me how sharing ideas and helping each other with experiments is critical to doing research,” Holstien says. “I’ll take that feeling of community with me wherever I end up.” What’s not clear, however, is whether she’ll take all of the SpongeBob paraphernalia she’s accumulated over the past four years, including cups, pajama pants, pens, a towel and, of course, a collection of SpongeBob sponges. —Lindsay Moran



SpongeBob’s popularity aside, April and Malcolm Hill say that sponges are attracting attention as a potential source of anti-cancer drugs, for the clues they offer on human evolution, and for the roles they play in the ecology of marine systems.

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APRIL HILL