

Interview with David Caron, Fellow of the American Academy of Microbiology

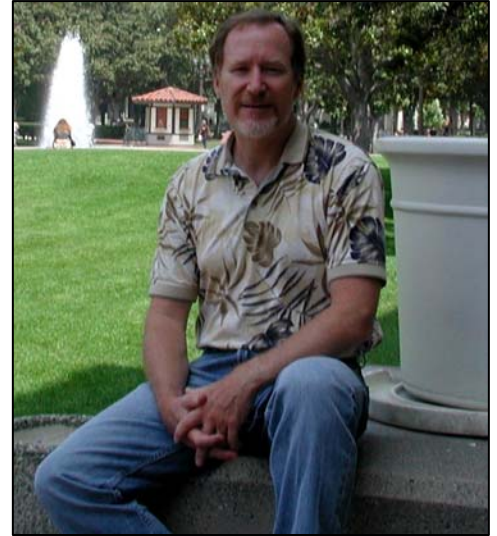
Dr. Caron's work focuses on the physiology and ecology of protists, particularly protists from deep sea and hydrothermal vent environments. Dr. Caron is at the University of Southern California.

What first got you interested in protists?

I did a master's degree with John Sieburth at the University of Rhode Island, at the graduate school of oceanography there. John was a pioneer microbiologist in ocean sciences. He opened my eyes and showed me that protists play an extremely important role, but at that time it was extremely poorly recognized how important that role was. I saw it as a field that would grow and develop and bloom in terms of research endeavors and recognition of how important protists are.

In your mind, what's the biggest outstanding question about protists that you'd like to see answered?

I can pick two - they're related. Right now the scientific community is trying to understand the depth of diversity within natural protistan assemblages. Trying to understand protistan diversity and trying to understand what that diversity means in terms of system function, ecosystem function, are a couple of the main themes being researched in the field right now. Related to that, is the issue of how widely distributed some of these populations are. Of course the microbiologist's credo is typically "everything is everywhere and nature selects." But at some point, organisms become large enough that their distributions are not necessarily ubiquitous.



Your research has taken you to Antarctica, the Sargasso Sea, and Catalina Island, just to name a few study sites. What's it like trying to get science done at far-flung (and sometimes sub-freezing) destinations like these?

The phone doesn't ring, I don't get mail (except for some email, and only limited amounts). So, it's actually great. Some of the most productive times that you can spend are spent in places that are fairly remote. The organisms are there, but the hindrances to studying them aren't.

Do you get to use Alvin?

We will. On the deep sea cruises we're going to do some dives in Guaymas Basin in the Gulf of California, and then we're going to do some dives on a hard rock hydrothermal vent at Nine North [500 miles from the coast of Mexico].

What do you think is the most understudied microbial system?

Speaking as an oceanographer, the most understudied environment is the deep sea. It constitutes something like 90% of the volume of the ocean, and we know very little about what goes on there. From the viewpoint of volume and ecological space on the planet, the deep ocean is by far the most understudied.

What is your favorite microbe? Why?

A planktonic foraminiferan called *Orbulina universa*. It's an absolutely gorgeous organism that lives in open ocean surface environments. It has symbiotic dinoflagellates that it holds within its tissues. It has beautiful long spines that come out from it - calcite spines - and it creates what amounts to a living spider web of itself, of its own cytoplasm in which it drapes these dinoflagellates so that they can photosynthesize. It will extend those pseudopodia and the symbionts during the day when it's daylight, and then at night it will pull them back

towards the shell. So it actually has a way of controlling the activity essentially creating its own little farm. It also appears to have a lunar periodicity to its reproduction. I think it's pretty incredible.

If you could name a new microbe right now, would you name it after yourself? If not, how would you name it?

No, I wouldn't – I've got a little ciliate already named after me and that's about as obscure as I want to get. [Ovolembus caronii was identified by Eugene Small and Denis Lynn.] Together with Rebecca Gast at the Woods Hole Oceanographic Institution, we've just isolated and published on a small heterotrophic dinoflagellate down in the Antarctic. It eats algae, but it retains the chloroplasts of the alga and it retains them in a functional state for weeks. So it eats the alga and steals its chloroplasts, so we are planning to name this organism *Kleptodinium antarctica*.

What advice would you give students about life as an academic microbiologist?

In general, I give graduate students only one piece of advice, and that is that you absolutely have to love what you do. Anyone who does research in academia for anything other than pure love of what they do is too smart to be wasting their time to be doing something they don't like. Enthusiasm and love for what you do is very important.

What is something about you that most people don't know?

The secret is out: I am not related to Leslie Caron. There aren't too many surprises here, really.

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<http://www.asm.org/Academy/index.asp?bid=36993>