Tim Carroll

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Sent:	Monday, November 03, 2014 10:54 AM
То:	execsec@chilmarkma.gov
Cc:	David Remsen; asstexecsec@chilmarkma.gov
Subject:	Sea slugs in Menemsha

Dear Tim Carroll,

My name is David Remsen and I manage the Marine Resources Department at the MBL in Woods Hole. On Saturday, 8 November, Dr Sid Pierce, of the University of South Florida, will be visiting a marshy area in the back of Menemsha Pond with a group of Japanese filmmakers, who are creating a documentary that features a small sea slug (a marine shell-less mollusk) that lives there, call *Elysia chlorotica*. I contacted the Harbor Master and Shellfish Officer today to let them know what will be happening in case someone notices a small group with lights and cameras in that area.

Elysia is interesting for a couple of reasons, which I have learned from Sid in helping him set this up. It only gets about 1.5 inches long and it's bright green because it feeds on a type of algae in the marsh. It sucks the green chloroplasts, the little organs that use solar energy to create food, out of the algae like drinking through a straw. They don't digest these but instead, use them to make food for themselves. They spend the winter and spring soaking up sunlight and growing.

Elysia is able to keep the algae cells alive in its body for many months whereas normally they die. They think they do this because somehow they have managed to transfer genes that make chlorophyll from the algae to their own genome; making them effectively part plant and part animal. Some scientists like Sid find this interesting. But there are wider and more applied interests too.

Two young German guys were in here in June looking for the same animal looking to make their fortunes. They have been involved with developing new treatments for severe burns. Burns are prone to infections and so must be covered with salves and dressings to keep bacteria off them. This also keeps air off the burns. But oxygen from the air dramatically boosts healing of burns. Severe burn victims may be put in sterile oxygen tents to boost healing but this is complicated and expensive. The Germans are working on a wound dressing salve that can both keep bacteria off and produce oxygen? How? By using the same algae chloroplasts that *Elysia* uses. Shine light on a dressing with these chloroplasts and it produces oxygen! It works but they can't keep the chloroplasts alive for more than a few days. What they want to know is how *Elysia* can keep them alive for months and replicate this in a dressing. Then they've got something. *Elysia* may help develop burn treatments that save lives!

This is a great example of what I've learned since taking this job here. Even the critters I curse when scraping them off the bottom of my boat may have some secret function or feature that someone might take the time to dig into and transform into something that changes lives. This little slug that 99.9999% of humanity don't even know exists back there in your Menemsha creeks are just doing what they do to survive and yet, with patience, research and imagination we learn from it. So, that's a little bit of a behind they story of what they will be doing back there in their boots on Saturday.

Best wishes, Dave Remsen See: http://www.wired.com/2010/01/green-sea-slug/

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