Summer is the season for vacations, especially if that vacation means going to the beach! But for all of us in the BCDB program, there are certain unspoken expectations from our family and friends even when we are on vacation. What are these silent expectations? Well, you are a “doctor”, or almost, right? And doctors are really smart about everything, right?

Obviously, we know that this is not necessarily the case, however, sometimes it is nice to be able to drop some random tid-bit of knowledge to assist in maintaining the façade around family and friends. To aid in your summer endeavors, we decided to provide you with some interesting scientific factoids about some of the aquatic wildlife you might encounter on a beach vacation.

**Dolphins**: Did you know that most dolphins do not have hair, but they do have hair follicles. The hair follicles are believed to act as a sensory mechanism for the dolphin. Also, did you know that orcas, or killer whales, are actually dolphins as well?

**Jellyfish**: Did you know that the gelatinous substance situated between the epidermis and gastrodermis (the epithelial lining from the oral to the anal cavity) is called mesoglea? Also, on the tentacles of many jellyfish species are thousands of nematocysts filled with venom which allow the jellies to sting and paralyze their prey.

**Starfish**: Did you know that starfish have two stomachs? The cardiac stomach can actually be extruded outside the body to engulf the starfish’s prey. Then, when the starfish retracts the stomach back inside the body, the ingesta is transferred to the pyloric stomach. Also, did you know that starfish have “eye spots” on the tips of their arms that allow them to differentiate between light and dark?

**Sea otters**: Did you know that sea otters have the densest fur of any animal on the planet? They can range from 250,000 to 1 million hairs per square inch of skin. They rely on their hair for insulation instead of a layer of blubber (adipose tissue), like most other sea mammals.

Congratulations! You are now armed with amazing scientific facts about some common marine animals. Hopefully this will suffice to maintain your geekdom while on vacation!

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**“Wear Sunscreen”**

“If I could offer you only one tip for the future, sunscreen would be it.” - Baz Luhrmann

It is definitely not news that long-term exposure to UV-rays can be damaging to the skin, and can cause premature aging, increased risk for skin cancer, and even immunosuppression. Everyone who’s who knows the negative effects of UV-rays, but along these lines knowing that smoking or excessive alcohol use is unhealthy does not always stop people from doing so either. I definitely should have listened to Baz, and my parents for that matter. Being tan has always been a fad of the summer. From age 13 to 23 my pale-skinned self would bask in the sun SPF-free for hours on end every summer. I would get a base burn, which would then develop into a nice tan throughout. Every so often I would overdo it, and my skin would peel or even blister. I figured this was normal, happened to everyone and didn’t seem to me to be so much of a problem, since there was no history of skin cancer in my family. Spring 2008, before age 24, I had a melanoma-positive mole removed. I was fortunate enough to catch it early, but believe me… I have been freaked out ever since. I learned my lesson and am much more careful now. My advice to you, from my own “meandering experience”, is to wear sunscreen!

What exactly is sunscreen? The lotion has physical compounds,
such as zinc oxide and titanium oxide, which reflects or scatters UV light, and/or chemical compounds that absorb the UV radiation and dissipate the energy as heat or energy. SPF is the sun protection factor, which is defined as the ratio of the least amount of UVB radiation (which is thought to be 1000x more likely to burn you than UVA rays) required to produce minimal sunburn on skin that is protected by sunscreen versus on skin that is unprotected. A lot of times sunscreen is misuse. People may believe they are fully protected from the sun if wearing sunscreen with any amount SPF, and as a result may stay out in the sun longer or forget to reapply after getting wet or sweating. A common misconception is that SPF is linked to duration of UV exposure. One source claims that SPF is dependent on how likely you are to burn for a certain period of time, and if you apply SPF 15, it will take 15x more UV radiation to burn you. Another source claims that SPF and duration of protection is not linear, and no marketed sunscreen can claim full protection for longer than 2 hours in direct sunlight, without reapplication.

Many studies show that sunscreen use has benefits in protecting your skin from UVA and UVB rays, which can reduce your risk for cancer and also slow down the aging process. However, there has been controversy over sunscreen and whether or not it can cause negative side effects, one reason being the chemicals used in sunscreen, such as oxybenzone. One study showed increased proliferation of human breast cancer cells when exposed to oxybenzone, as well as increased uterine weight in rats. However, the dosage given to rats may not have been fully representative of the amount in sunscreen used daily by humans. Another study investigated changes in hormone levels upon whole body application of sunscreen and showed no significant change. So although oxybenzone may be harmful in large doses, especially if ingested, studies seem to suggest that the amount normally applied on the skin from sunscreen is not toxic. However, in case you are wary of the possible side effects of oxybenzone, there are oxybenzone-free sunscreens out there! Here is an article on yahoo that recently reviewed the best sunscreens on the market. 


Another controversial effect of sunscreen is that it can lead to vitamin D deficiency. Vitamin D is produced from cholesterol when skin is exposed to the sun on days in which the UV index is above 3. 7-dehydrocholesterol reacts with UV light at wavelengths between 270 and 300, to produce 10,000 to 20,000 IU of vitamin D. I had my vitamin D levels tested and was deficient for a while, and as a result began taking vitamin D pills. Personally, I would rather take the vitamin D supplement and be cancer free than the alternative. However, some doctors encourage 10-15 minutes of sun at high noon with no sunscreen in order to get the full dose of vitamin D, because the amount of vitamin D absorbed by taking a supplement may not fully replace the amount produced by sun exposure, which is important for calcium absorption and healthy bones. I recommend getting your vitamin D levels checked to see if you are deficient before sitting out in the sun unprotected at the worst time of the day, then ask your doctor what they recommend!

There may be minor health benefits from sun exposure, for example if you have psoriasis the immunosuppressive effects of UV rays can be beneficial in clearing your skin. In this case, minimal exposure is ok, but unless you have a medical reason for basking in the sun, the adverse effects of UV-rays greatly outweigh the benefits. So my advice to you folks is to “wear sunscreen.” Trust me, your skin will look beautiful well into your old age.


Are the Kickball Tides Turning?

Dawn Barnes

The spring semester was concluded with a kickball competition. Thanks to all who showed up for making it a great time. The first game was exciting, with the men beating the women due to a few key home runs. The second game pitted faculty (subsidized with post-docs and family) against students, in an epic battle for the ages. The kickball prowess of the BCDB faculty is well-known. However, this year we are proud to report the first WIN by BCDB students! Great job everybody and thanks to the BCDB Social Committee for hosting such a great event. And keep your eyes peeled for future BCDB social events including a night of beer and board games.
Dear Sea Farers, 
Beware the Mermaids 
(folklore with a metaphoric twist) 
By Jadiel Wasson

The sea is a vast and deep entity. With its unpredictability and enormity, it has intimidated and fascinated sea farers throughout time. Many have readily embraced sea travel as a way to explore and discover what may lie beyond the "edge of the plate" in hopes of expanding knowledge. These brave souls have dared to face uncertainty and in return humankind has benefited. This has lead to the sea as being a symbol for not only wonder and mystery but also hope and truth. In order to make sense of it all, much folklore and mythology has been created to explain the mystery and fascination behind the sea. Mermaids are a long standing part of this folklore. Being either myth or truth, they are seen as dual entities. With their sweet, intoxicating voices and appealing nature, they have lured many sea farers to safety or more often, to their doom. Much debate has been spurred as to whether mermaids are real or figments of the imagination.

In parallel, science is very much like the sea in its fascinating vastness, unpredictability, and the mystery that envelops it. We scientists are the sea farers; the navigators that are just trying to make sense of it all in hopes of pushing boundaries and expanding general knowledge. We rely on our sense of logic, focus and experimentation to navigate the rough seas of the scientific world. It is this way of thinking that leads us to great discoveries and brings enlightenment to humankind. But sometimes we can get lost at sea. As is the nature of science, its unpredictability and confounding nature can send us floating in the darkness with no direction; lost in a cloud of data that seemingly makes no sense. But then....we hear the call and see the aura of the ever appealing "mermaid": that idea or piece of data that can send us reeling even if our senses tell us to beware. We begin to lose focus on the big picture and lose our sense of logic and good experimentation that could help us navigate through. Is the mermaid real? Or is she a figment of our imagination? Many have fallen into the clutches of a "mermaid", who can be a savior to some or an omen of doom to others. But in every case, it's always safer to proceed with caution.

So in the end, the moral of the story is: Beware the mermaids dear sea farers, for they may be real or merely manatees.
Local Beach Destinations

Atlantic Ocean:
1. Hilton Head Island, SC
290 miles; 4hr, 30min
With the average air and water temperatures both being in the 80’s, the 12 miles of beach are great for relaxing. Much of the coast is private but you will gain access to a private beach by renting a location within its gated community. The culture of the island is active and there are festivals all summer, including Tuesday night fireworks.

2. Myrtle Beach, SC
360 miles; 6hr
This man-made island is packed with family attractions. If you want to catch the ocean from the top of a ferris wheel, this is the place for you!

Gulf of Mexico:
3. Destin
4. Panama City
5. Pensacola, FL
300 miles; 5hr, 30min
With white sands and warm, clear emerald waters, the sub-tropical gulf beaches are like a trip to a tropical island.

6. Clearwater Beach, FL
490 miles; 7hr, 30min
This destination may require more of a drive but the opportunity to swim with manatees is worth it. Dolphin sightings are common from this gulf beach.

Recommended Beach Reading

A good book is essential for a trip to the beach. Here’s some suggested summer reading that will keep science on your mind while on your beautiful beach vacation.

Napoleon’s Buttons
By Penny Le Couteur
Napoleon’s Buttons describes seventeen groups of molecules that have helped shape the history of the world. These molecules have influenced medicine, engineering, the legal system, our cuisine and our clothing. This book is the perfect mixture of chemistry and history.

The Story of Forgetting
By Stefan Merrill Block
This work of fiction tells the story of two characters, a teenage science nerd and an elderly hunchback, who share the struggle of having loved ones with Alzheimer’s Disease.

Ignorance: How It Drives Science
By Stuart Firestein
Firestein describes science as often being “like looking for a black cat in a dark room, and there may not be a cat in the room.” The book also includes case studies to demonstrate his points.

Bellwether
By Connie Willis
A romantic comedy set in a research institute featuring a sociologist and a chaos theorist. The two scientists meet by chance and realize that a collaboration will benefit both of their research programs.

Genentech: The Beginnings of Biotech
By Sally Smith Hughes
Hughes tells the story of the first biotechnology company, Genentech. From it’s precarious beginning through its many successes, including portraits of its co-founders Herbert Boyer and Robert Swanson.

Stiff: The Curious Lives of Human Cadavers
By Mary Roach
Stiff explores the many uses for human cadavers. In addition to the important role cadavers play in the medical field, they are also used for more unexpected purposes including testing guillotines in France and being passengers on NASA space shuttles.

If you’re interested in finding more science-themed books, try the books, et al. section in Science magazine and lablit.com. Happy reading!!
Sizzlin’ Summer Suggestions

Skye Comstra

Only Atlanta summers can make me appreciate the frigid Whitehead temperatures, but even the most heat-averse among us have to come out eventually. Hopefully the summer offerings of ice cream, movies, beer and great food will be worth leaving the air-conditioned oasis!

Festivals

Or for the lactose intolerant who love a good festival, there’s always:
- Attack of the Killer Tomatoes Festival, July 21st, $50
- 10th Annual German Bierfest, August 2-7, $40
- Great Atlanta Beer Fest, September 7-$35

ATL Farmers’ Markets (All Summer)
If you haven’t hit up one of the fantastic area farmers’ markets yet, now is the time to do it! Fresh GA peaches are just starting to arrive!
- Morningside: Sat 7:30-11:30am
- Decatur: Wed 4-7pm, Sat 9am-1pm
- East Atlanta Village: Th 4-8pm
- Green Market at Piedmont Park: Sat 9am-1pm
- East Lake: Sat 9am-1pm
- Peachtree Road: Sat 8:30am-12pm

Grab Some Brews With Friends
By now, you’ve probably been enjoying the beloved Sweetwater happy hour, but did you know that the Atlanta area has one of the fastest growing craft beer scenes in the country? More than a dozen breweries are anticipated to open in the next few years, and there are already plenty with open taprooms:
- Monday Night Brewing: Atlanta, GA, Tastings Mon/Th 5:30-7:30pm and Sat 2-4pm. Pro tip: Admission is $1 off if you bring a tie to donate to the décor. http://mondaynightbrewing.com/
- Red Hare Brewing Co: Marietta, GA, Tastings Th/F 5:30-7:30pm and Sat 2-4 pm. http://www.redharebrewing.com/
- Jailhouse Brewing Co: Hampton, GA, Tastings Th 5:30-8pm and Sat 2-6pm. http://www.jailhousebrewing.com/
- Coming Soon! Blue Tarps Brewing Co. (Decatur, GA) and Jekyll Brewing (Alpharetta, GA) are both on schedule to be open to the public this summer.

Recent and Upcoming Restaurant Openings
If you need to grab some dinner after all those beers, consider checking out one of ATL’s newest restaurants:
- Boccalupo: Inman Park, Italian http://boccalupoinmanpark.com/
- Paper Plane: Decatur, Gastropub + Cocktails
- Yum Bunz: West Midtown, Bao & Dim Sum http://yumbunz.com/
Congratulations!!!

Kevin Morris: New DSAC Student Representative
Chelsey Ruppersburg: New BCDB Student Representative
Newsletter Committee:
Megan Allen, Dawn Barnes, Skye Comstra, Mariana Mandler, Matthew Randolph, Jadiel Wasson, Katie Williams

If you're interested in joining the newsletter committee, please contact Matthew Randolph (merando@emory.edu).