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If you have ever gone swimming in a lake, you've probably wondered what is lurking in the water next to you, but the water is too murky to see in. Now, imagine that you had the ability to know exactly what is going on around you whilst under the water. Pretty cool, right? Studies from marine biologists have shown that a seal's whiskers have this exact skill. What's even better is that, through the process of biomimicry, seal whiskers are a promising solution for energy efficiency, stronger underwater structures, and improved underwater radars. The process that marine biologists use to exploit and use the structure of a seal's whiskers truly is fascinating, and the seal's whiskers even more so.

Dr. Christin Murphy, head of the bio-inspired research and development team in Newport, Rhode Island sums up what a seal's whiskers can do. "... [Seals] can use those whiskers to track moving objects in the water, like fish, by the minute water disturbances those objects leave behind." This allows for the seal to accurately track down fish to eat or possible predators that they need to evade. Good luck trying to sneak up on these marine mammals.

On its own, having an internal super-radar is a remarkable feature to have, but what's even cooler is the how of these whiskers. The secret behind this compelling talent lies in their shape and structure. A seal's whisker has geometry similar to that of a cylinder. On these whiskers lie bumps that reduce the vibrational noise they leave behind while swimming. Dr. Murphy compares this to finding the direction of the wind from a flag versus a windsock. "... When the wind blows a windsock it inflates with air, and that pressure inside makes it resist fluttering so we get a much less noisy indication of the wind direction." Like the windsock, the bumps on a seal's whisker stop them from fluttering around in the water. This design enables whiskers that are downstream to catch a cleaner signal, since whiskers upstream won't be causing a disturbance in the water.

With all of this acquired knowledge in mind, how exactly does a seal's whisker provide solutions for energy efficiency? Dr. Murphy provides us with the idea of wind turbines. Typically, wind turbines will be placed bunched up in an area to gain as much energy as possible, but placing so many turbines in such a confined space blocks the airflow to other turbines, resulting in less efficient and lower quality air. At this point, the idea of efficiency is thrown out the window and into the wind... Or at least what remains of it. Murphy and her team questions that, if a seal's whiskers can minimize disturbances in water flow, can their design be replicated in wind turbines? I believe that this is a very smart and very plausible idea that can happen in the near future.

However, if I had to place myself in the shoes of a bio-inspired engineer, I would suggest using the geometry of a seal's whiskers to support structural integrity. Take a look at your local dock and notice how the waves crash against the pillars supporting you. The waves crashing against them and the current of the water surely causes fatigue in the structure's integrity. Enlarging the shape of a seal's whiskers and putting them in place of the dock's pillars will reduce the pressure that the current places on them.

Additionally, seal whiskers could offer other solutions to underwater radars. Currently, submarines use radio waves to locate moving objects, but utilizing the design of a seal's whiskers could allow underwater vehicles—or any type of underwater sensor, really— we could have a more accurate radar of our surroundings using vibrations to detect the size and speed of an object. This can be used to identify foreign vehicles or to track marine animals and their trails. The process to create such a sensor will be complicated, but I believe that, if pulled off, this sensor will be extremely advantageous.

Given these points, a seal's whiskers are way more thought-provoking than many people think. In just a few paragraphs, we've covered three basic innovations that seal whiskers provide us: energy efficiency, better structural integrity, and improved underwater radars. Remember that the seal is only one of many different organisms, and the possibilities are endless. There are many more different organisms that we can use to input into our own technology. All that's left is to put them into action.