Coral Medicine

Corals are some of the most beautiful creatures of the ocean and can come in a variety of different sizes, colors, and shapes. There are hard corals and soft corals. Hard corals have a strong exoskeleton made of calcium carbonate and are porous, which is similar to human bone. This makes it ideal for use in bone graft procedures. Coral must be processed for surgical use before it can be grafted to bone. Coraline hydroxyapatite is the solid chemical that is formed after processing. These bone grafts are not suitable for all bone injuries. Furthermore, bone grafts from coral will not stimulate or form bone on its own; however, bone growth can be stimulated with hormones or bone marrow cells. Coral bone grafts do appeal to doctors and surgeons because they require less surgeries than typical bone grafts and there is less risk involved.

Toadfish Medicine

Toadfish are strange creatures indeed. The males can contract their bladder extremely fast in order to call for a mate. Researchers believe that studying these muscles may help them fight cardiomyopathy, when the heart cannot pump blood properly because of its inability to relax normally. Scientists believe that parvalbumin, a protein, is the substance that allows the toadfish bladder to contract and relax so quickly. This protein is also found in human skeletal muscle but not in the heart. There are studies being conducted on the benefits of inserting parvalbumin into myopic hearts. Another unique adaptation belonging to the toadfish that scientists find interesting is their ability to regenerate the central nervous system. When cut, the spinal cord of the toadfish will regenerate completely, unlike humans’. Scientists believe this could lead to advances in prosthetic devices for people with central nerve damage.

Quick Facts

- A sponge from the Caribbean has been found to produce a chemical used to fight the AIDS virus.
- Skates are being studied to help treat blindness.
- A marine microalga contains two essential fatty acids found in breast milk; infant-formula manufacturers use these algal-derived constituents in some products.
- An anti-inflammatory substance being used in anti-wrinkle cream comes from a soft coral.
- A microbe found in undersea hydrothermal vents helps decrease the thickness of underground oil.

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Remember

The Institute for Marine Mammal Studies (IMMS) is a non-profit organization established in 1984 for the purpose of public education, conservation, and research of marine mammals and sea turtles in the wild and under human care. Located in Gulfport, MS, IMMS has been an active participant in the National Stranding Network since its inception. IMMS is the premiere organization in the Mississippi-Louisiana-Alabama sub-region of the Gulf Coast with the capability and experience to care for sick and injured marine mammals and sea turtles. Additionally, IMMS promotes public awareness of marine conservation issues through its involvement in the community.

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Centuries ago, man looked to the ocean for answers to things he did not fully understand. There he found many uses for its contents. In ancient Rome, the sea hare was harvested for its poisonous qualities. The ancient Chinese believed that sea cucumber had disease preventative properties. Fish liver oil has long been perceived as a miracle cure for many diseases. Now because of the invention of SCUBA, the world’s ocean has become readily accessible and its exploration is on the rise. With the number of infectious diseases escalating, scientists have searched everywhere for cures. Now, that search has been expanded to include our oceans. Scientists have now discovered drugs, that are derived from ocean dwelling organisms, to help combat cancer, HIV, tuberculosis, dengue fever, and malaria. Also, by studying these creatures, researchers have learned more about the human body. This is only the tip of the iceberg. With only five percent of the ocean having been explored presently, there are huge amounts of untapped resources awaiting discovery. The most astonishing new trends in marine science today are these medicines from the world’s ocean. In the next few years we can expect major advances in the field of medicine due to our allies, the seas.

For centuries sharks have been too often perceived of as mindless eating machines that prowl the shorelines preying on humans. It so happens that sharks could help us significantly more than they have caused harm. Recently, medical breakthroughs have been made with the help of sharks. Researchers have discovered a cholesterol-like compound found in shark tissue called squalamine. This compound fights viruses and may potentially stop the spread of cancer. Squalamine fights viruses by disrupting their life cycles. Squalamine is positively charged and attaches to negatively charged cells and membranes. In turn positively charged proteins, which viruses depend to reproduce, are removed. Squalamine has been found to have effects on dengue fever, hepatitis B and D, as well as other viruses. Squalamine also inhibits blood vessel growth. Cancer cells need blood vessels and increased blood flow to survive inside the human body. Therefore, scientists believe squalamine could also potentially stop the spread of cancer. Laboratories have been able to synthesize squalamine since 1995, so no sharks have to be harmed in order to cultivate the molecule.

Horseshoe crabs have been shuffling across the ocean floors for over 450 million of years. These strange creatures have much to contribute to the medical community. First, horseshoe crab blood is used to test for toxic bacteria in vaccines, intravenous drugs, and medical devices. This blood is blue in color and clots when in contact with these bacteria. This makes it a perfect testing agent for pharmaceutical companies. Secondly, we have learned much about the human eye from studying the horseshoe crab eye. Horseshoe crabs have very simple eyes and the optic nerve can be accessed relatively easily. These features have helped scientists learn more about our eyes and some of the diseases that plague them. Lastly, horseshoe crabs provide materials that aid in wound care. Their shells are comprised of a substance called chitin. All arthropods have shells that contain chitin; the horseshoe crab is favored with the help of sharks. Researchers have discovered drugs, that are derived from ocean dwelling organisms, to help combat cancer, HIV, tuberculosis, dengue fever, hepatitis B and D, as well as other viruses. Squalamine also inhibits blood vessel growth. Cancer cells need blood vessels and increased blood flow to survive inside the human body. Therefore, scientists believe squalamine could also potentially stop the spread of cancer. Laboratories have been able to synthesize squalamine since 1995, so no sharks have to be harmed in order to cultivate the molecule.

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The cone snail is a highly venomous gastropod that resides in tropical waters around the globe. Cone snail venom works by attacking the nervous system and paralyzing prey. The success of this venom comes from hundreds of thousands of small proteins called peptides. These conotoxins have been studied by scientists in use as painkillers since the 1990s. One synthetic conotoxin, called Prialt™, has already been approved by the U.S. Food and Drug Administration. While this drug works well in treating chronic pain, it has a major downfall. Prialt™ must be injected directly into the spinal cord, usually by way of a surgically implanted pump. This is because these toxins decompose before they reach pain receptors if taken orally. Recently, scientists have engineered a kind of super conotoxin. Scientists know that unusual peptides with the chemical structure of a circle are more stable and harder to decompose. With this knowledge, scientists added amino acids to synthetic conotoxin to form a ring structure. In trials, scientists learned that this painkiller, taken orally, was 100 times more potent than any other currently on the market. Furthermore, it works in lower doses with a lower chance of addiction.

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