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Passion and Purpose: One Student's Journey to Medical School

Christa Brown
Liberty University, cbrown293@liberty.edu

Passion and Purpose
One Student's Journey to Medical School

By Christa D. Brown

SPLASH. Bending at the waist and lifting my legs into the air, I allow their weight to propel my body toward the coral shelf beneath me. The water closes over my toes and I press my forehead down initiating an undulation through my body that ends as my legs complete a dolphin kick. Fifteen feet under the surface, the pressure increases inside my head I pinch my nose, re-pressurize my ears, and shift air from my lungs to my mask. Slivers of light cut through the water like dancing spotlights.

Photo by author

SWISH. The page turns. A diagram of respiration covers the two-page spread of my physiology textbook and helps me understand the processes that allow me to explore the marine world. At the start of a dive, my lungs fill with fresh air; the difference between the partial pressure of oxygen in the alveolar sacs and the oxygen-depleted alveolar capillaries encourages the flow of oxygen down the pressure gradient into the capillaries, and ultimately into the erythrocytes. There, the tetrameric hemoglobin utilizes the iron atoms of its heme prosthetic groups to bind oxygen molecules. This protein, tightly bound to oxygen, courses through my blood vessels to the rest of my body, including the oxygen-needy muscles propelling me through the water. In oxygen-poor areas, factors such as lower pH and higher concentration of carbon dioxide encourage a conformational change in hemoglobin releasing the oxygen in the areas of greatest need. This complex respiratory system, a fusion of chemistry, physics, and biological structure, sustains life—and mesmerizes my mind. This system, in concert with others, allows me to dive and explore.

The goal of my free dive? To explore a tunnel created by the coral formations growing on the old lava at the bottom of Shark's Cove, Pupukea Beach Park. If the oxygen stored in my lungs depletes too quickly, there is one opening mid-way through the tunnel through which I can escape to the surface for air. Reaching the depth of the tunnel entrance, I stroke forward and the coral closes around me.

I love understanding the "why" and "how," not just the "what is." Even as a child, I regularly dissected slugs and once lifted my little brother's eyelid while he napped so I could touch his eye and discover what it felt like rolling around in the wanderings of sleep. Now I ask other questions: Why do I breathe air? How do I stroke and kick?

In that dive, I am a part of the ocean which surrounds me—but my back scrapes against the coral above me and my mind tells my muscles that I must reach the surface soon. My somatic motor neurons are releasing acetylcholine onto the motor end plates of additional muscle fibers in my legs. At the cellular level, this initiates a cascade of events moving various ions, sensed by receptors and ultimately resulting in the stronger contraction of the muscles in my legs. I initiated this signal pathway to my muscles unconsciously, but within milliseconds the muscle fibers respond and I glide through the water with increased urgency. A surge of turbulent water fights my progress, but light is just visible at the end of the tunnel, promising oxygen where the rays slow as they intersect the water.

Photo by author

Breaking from the tunnel into the open water, I spiral upward toward the rays of light, exhaling bubbles that race me to the surface. Joy and relief flood into my body as a fresh breath fills my lungs. I swim to shallower waters to recover. At the tide pools I gently extract a sea cucumber from his bed on the rocks. Cradling his wrinkled cylinder in my palms, I watch his swath of tube feet search for safety and adhere to my hands with suction of startling strength. I then replace him in a comforting crevice of coral and continue to peruse the cove.

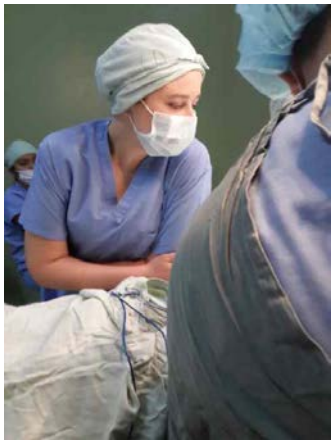
Photo by author

The cove fascinates my curious mind, but understanding how the human body lives and breathes and swims engages my mind and heart more completely. Albert Einstein observed, “Only a life lived for others is a life worthwhile.” Knowledge alone is incomplete, lacking purpose. Medicine is beautiful because it gives purpose to knowledge. While working in hospitals in Guatemala (with the Liberty University Spanish Institute), and in a community health clinic in my home state of Hawaii, I’ve experienced the joy that comes from applying my “classroom knowledge” to help relieve pain, treat parasites, teach proper hygiene, etc. Physicians learn and explore, using what they’ve discovered to aid and strengthen others.

Discoveries about respiration and hemoglobin and muscle fibers do not simply satisfy my inquisitive mind. Rather, they can serve to help someone with asthma, or cystic fibrosis, or muscular dystrophy. This greater, more meaningful use of knowledge is why I am excited to attend medical school. I want to be forever learning, forever discovering, and forever using my knowledge to help others.