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The Circulatory System: God's Miracle

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THE CIRCULATORY SYSTEM: GOD'S MIRACLE

Introduction

The human heart is the second-most vital organ of the body, after the brain. The heart is usually referred to as a "pump" because of its job pumping the red life-sustaining liquid called blood. But the heart and blood are not the whole picture. There are approximately 60,000 miles of tube-like vessels which carry blood from the heart to the whole body.[1] These thousands of miles of vessels, plus the heart and blood, make up the circulatory system.

This essay will only cover the heart and vessels, which by themselves are called the cardiovascular system. It will explain their amazing design, examine the evolutionary hypothesis of how the human cardiovascular system formed, and point out by its own wondrous design that it could not have evolved by multiple mutations, but rather was the result of direct and intentional design by the Almighty Creator God.

The Heart

This amazing organ is only the size of a clenched fist and weighs an average of 9.8 ounces in a grown adult.[2] It is comprised of four "chambers," the two upper chambers, called the right atrium and left atrium, sit on top of the two lower chambers, called the right ventricle and left ventricle. These four chambers work together in perfect rhythm to pump blood through the lungs and body. The process of blood flowing through the whole body is called systemic circulation. The process of blood flowing through the heart and lungs is called pulmonary circulation. The pulmonary circulation will now be examined in detail.

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[1] Brad Harrub, "The Unevolvable Circulatory System," http://www.apologeticspress.org/apcontent.aspx?category=9&article=980 (Accessed April 20, 2020).

[2] *Ibid.*

Deoxygenated blood flows into the right atrium, which pumps the blood down into the right ventricle. The right ventricle contracts, forcing the blood into the pulmonary trunk, which splits into two pulmonary arteries, directing the blood into the lungs. While in the lungs, the blood releases carbon dioxide and receives fresh oxygen. From the lungs, the blood travels through the pulmonary veins into the left atrium, which then contracts, driving the blood into the left ventricle, from which the blood enters the systemic circulation.[3] This is the heart's part in the circulation story, but before leaving the heart and moving on to the vessels, one more thing must be mentioned.

Every cell in the body must receive oxygen, nutrients, etc. and be relieved of carbon dioxide and other wastes. The heart makes this possible, but even the heart is comprised of thousands of cells that need this same exchange of oxygen and nutrients/carbon dioxide and wastes. How does this work? Does the heart have its own special "heart" to pump blood through all of its blood vessels to provide for all of its cells? No.

The process of blood flowing to all of the cells in the heart tissue is called coronary circulation. The reason the blood already flowing through the heart cannot do this job is because it moves through the heart too quickly for the oxygen-nutrient/carbon dioxide-waste exchange to occur. Also, the blood is only passing through the heart's chambers, not entering the heart's tissues. Therefore, coronary circulation must do it through the heart's own network of blood vessels. Coronary circulation begins with blood flowing through the coronary arteries into the arteries and capillaries of the heart itself, performing its exchange and then flowing out by way of the coronary veins. Most of this "spent" blood is then returned to the heart by way of the coronary sinus, which carries the blood back to the right atrium.[4]

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[3] *Cardiovascular Anatomy and Physiology*, 2011, Bristol-Myers Squibb & Pfizer Inc., pp. 4, 6.

[4] *Ibid.*, p. 5.

The Vessels

Upon leaving the left ventricle, the blood is oxygenated and ready to travel through the body by way of the 60,000 miles of blood vessels.[5] From the left ventricle, blood flows through the aortic semi-lunar valve and then into the aorta. From there, the blood divides into many separate vessels, called arteries. It keeps flowing through successively smaller arteries until it reaches the smallest artery of all, the capillary.[6] When the blood reaches the capillaries, exchange takes place. Through the thin walls of the capillaries, oxygen, nutrients, and hormones are transferred from the blood to the cells and carbon dioxide and other wastes are transferred from the cells to the blood.[7] After this transfer takes place, the blood begins flowing through venules, the smallest veins in the body. These venules lead to bigger blood vessels called veins, which eventually carry the blood back to the right atrium of the heart. This is one complete cycle of the blood going through the body.

There are two types of blood vessels: arteries and veins. Arteries are the large vessels which carry blood away from the heart, and these vessels branch into smaller vessels called arterioles, which themselves branch into even smaller capillaries. The capillaries eventually merge with venules (the smallest veins), which in turn merge into bigger veins.

Blood vessels are comprised of three layers, surrounding the hollow interior of the vessel, known as the lumen. The three layers are the tunica intima, the innermost layer beside the lumen; the tunica media, the middle layer; and the tunica externa, the outermost layer.[8] These layers will now be examined in more detail.

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[5] *Ibid.*, p. 4.

[6] *Ibid.*, p. 4.

[7] Wikipedia, "Circulatory system," https://en.wikipedia.org/wiki/Circulatory_system (Accessed April 20, 2020).

[8] *Cardiovascular Anatomy and Physiology*, 2011, Bristol-Myers Squibb & Pfizer Inc., p. 17.

Tunica intima

This layer itself also consists of three layers, the innermost being the endothelium, which is comprised of flattened cells. This thin layer of cells is the lining of the inner surface of the whole cardiovascular system. The second layer consists of collagen fibers and is called the basement membrane. The collagen fibers in this layer are extremely important because they are the first factor in the coagulation cascade, causing the blood to clot when the vessel is damaged, thus stopping the blood flowing out of the vessel. If the blood were not stopped, the result could be death. The third layer is called the internal elastic lamina, and consists of elastic fibers. It also contains openings which allow for materials to move between the tunica intima and tunica media.[9]

Tunica media

This layer contains two layers in itself. The first layer is mostly elastic fibers and smooth muscle cells. The smooth muscle cells in this layer are a vital part of the vessel. They help regulate blood pressure and the rate of blood flow through the vessel. Also, when a vessel is damaged, the muscle cells contract to reduce the amount of blood loss. The second layer, the external elastic lamina, is composed of totally elastic fibers.[10]

Tunica externa

This is the outermost layer of the blood vessel and also consists of collagen and elastic fibers.[11]

As seen, the blood vessel is very intricate. Three layers make up each vessel, with each layer containing in itself three layers, two layers, and one layer, respectively, and each and every layer serves a specific purpose.

How did this amazing system form?

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[9] *Ibid.*, pp. 18, 33.

[10] *Ibid.*, p. 18.

[11] *Ibid.*, p. 18.

"Evolutionists claim…"

When considering the circulatory system through an evolutionary viewpoint, three important questions must be considered. When did it evolve, how did it evolve, and why did it evolve? Evolutionary scientists hypothesize that the first cardiovascular system appeared 600 million years ago in an ancestor of the triploblasts (organisms with three-layered germ cells, as in vertebrate embryos). They reason this was "to overcome the time and distance constraints of diffusion, thus permitting increased body size and metabolic rates…"[12] But how?

"Although it is impossible to trace the evolution of the circulatory system by using fossils…it is possible to theorize on its evolution by studying different groups of vertebrates and their developing embryos."[13]

Evolutionary scientists admit at the beginning that this whole hypothesis about how the circulatory system evolved cannot be based on any sound physical evidence, but must only be 'theorized'. With this bit of background information in mind, their explanation of the process will now be examined.

There are two types of circulatory systems: open and closed. Open circulatory systems have few or no blood vessels, and the heart pumps blood into spaces surrounding the organs. This system is found in arthropods and most mollusks. In closed circulatory systems, the heart pumps blood only through arteries and veins,[14] and this system is found in almost all vertebrates.[15] Evolutionary scientists believe that the open system led to the closed system through evolution.

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[12] R. Monahan-Earley, A. M. Dvorak, & W. C. Aird, "Evolutionary origins of the blood vascular system and endothelium," *Journal of Thrombosis and Haemostasis* 11 (Suppl. 1):46-66.

[13] "Circulatory system," *Encyclopaedia Britannica*, https://www.britannica.com/science/circulatory-system (Accessed April 20, 2020).

[14] Brad Harrub, "The Unevolvable Circulatory System," http://www.apologeticspress.org/apcontent.aspx?category=9&article=980 (Accessed April 20, 2020).

[15] Wikipedia, "Circulatory system," https://en.wikipedia.org/wiki/Circulatory_system (Accessed April 20, 2020).

According to evolutionary assumptions, "The first heart-like organ is believed to have appeared over 500 million years ago in an ancestral bilaterian [possessing left/right sides, head/tail ends, and top/bottom]."[16] This structure is assumed to have been "most likely a tubular pulsatile structure that lacked an enclosed vascular system, but instead served to force fluid through pericellular interstices [spaces between cells]."[17] This "heart" was then improved by the chordates (possessing a spinal cord) about 100 million years later, which supposedly had a completely self-contained vascular system. Hagfish and lampreys were the next step, sporting a closed vascular system, which contains "several contractile components in series, including the portal vein heart and the systemic heart."[18] There is a slight resemblance between the portal vein heart and the right-sided cardiac chambers found in birds and mammals. From the hagfish and lampreys, the line continued to teleost fish (finned fishes), which have a two-chambered heart. "Sometime" between the teleost fish and three-chamber hearted amphibians, the heart somehow changed so that it began having distinct systemic and pulmonary circulations. After amphibians are the reptiles, which have a muscular ridge from the apex to the ventricle's base which causes the separation of oxygenated and deoxygenated blood flowing through the heart. From reptiles evolved mammals with a distinct four-chambered heart, and presumably, humans evolved from mammals.

The claim is made that "…vertebrates evolved closed circulation systems designed to more effectively carry blood to organs and tissues. Precisely how that happened has remained a clouded issue."[19]

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[16] Eric N. Olson, "Gene Regulatory Networks in the Evolution and Development of the Heart," *Science* 313 (5795) (September 29, 2006):1922-1927, p. 1922.

[17] Nanette H. Bishopric, "Evolution of the Heart from Bacteria to Man," *Annals of the New York Academy of Sciences* 1047 (2005):13-29, p. 19.

[18] *Ibid.*, pp. 22-23.

[19] Scripps Research Institute, "Scientists unlock evolutionary secret of blood vessels," www.sciencedaily.com/releases/2012/02/120221124810.htm.

The blood vessels in the circulatory system "arose within the mesoderm of triploblastic animals." The appearance of the mesoderm (middle layer of three layered embryonic cells) "provided new building material for animal construction and allowed for the evolution of increasingly complex and large animals." It is presumed that at some time in the process of the evolution of blood vessels, mesoderm cells differentiated into a different cell type, which contained mesothelial (protective cell layer lining body cavities) walls. In these walls, some of the cells acquired myofilaments and the ability to contract. Endothelial cells were then derived from mesodermal zones, and other parts of the blood vessel came from the mesoderm or from the neural crest. This led to the endothelium of the blood vessel being formed.[20] Recall that endothelium is the thin cellular lining of blood vessels.[21]

Problems with the evolutionary assumption

As quoted before, there is no physical evidence for this path from the presumed first ancestor of vertebrate circulatory systems to the present-day human circulatory system. In fact, evolutionary papers explaining the process are full of wild speculation, freely using the words and phrases: "if," "likely," "may have," "probably," "thought to," "possibly," "another point of view is," "one possibility is," "it has been proposed," etc. Also, evolutionists themselves have not been able to reach one concise explanation of the evolution of the circulatory system. Many different, and sometimes contradictory, views are proposed, each very confusing and less than logical.

The heart is so amazing with its efficiency, durability, and reliability, and the blood vessels so vital, with the layers which comprise them each having a specific and very important role in the health and well-being of the

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[20] R. Monahan-Earley, A. M. Dvorak, & W. C. Aird, "Evolutionary origins of the blood vascular system and endothelium," *Journal of Thrombosis and Haemostasis* 11 (Suppl. 1):46-66.

[21] *Cardiovascular Anatomy and Physiology*, 2011, Bristol-Myers Squibb & Pfizer Inc., p. 18.

body, that it goes strongly against human reason to simply assume this happened all by random mutations, one thing evolving into another without any kind of intelligence behind it.

In order to have a working, life-sustaining circulatory system, all of the following must be present: a heart to pump blood, lungs or gills to oxygenate blood, blood to carry the oxygen to the body, a means to move the blood to all the organs, and an electrical system to activate and maintain the rhythmic and coordinated beating of the heart. If any one of these components is missing, life cannot be sustained. There is no time to evolve a better system or a different part for the system. And this is the way they are found - completely formed, with all the vital organs that work with them fully-formed and in their places.

There is no proof of any of the evolutionary hypothesis. It is based only on assumption.

The Bible says…

"And the LORD God formed man *of* the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul" (Genesis 2:7).

"So God created man in his *own* image, in the image of God created he him; male and female created he them" (Genesis 1:27).

"And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so. And God made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and God saw that it was good" (Genesis 1:24-25).

"And out of the ground the LORD God formed every beast of the field, and every fowl of the air…" (Genesis 2:19a).

Each kind of circulatory system is perfectly designed for the kind of animal it is in. In fact, even evolutionists admit that "An important take-home message is that cardiovascular systems are highly diverse in their structure and function. The design of a given system is exquisitely matched to the needs of the animal. It is not helpful to think of one system being 'superior' to another. Mollusks have no more need for a human heart

than humans have for a mollusk heart."[22] From the earliest known history, humans, mammals, reptiles, and amphibians have all had circulatory systems that fit their life functions best. There has not been found a single example of a transitional form or intermediate link between two different kinds of circulatory systems in a living creature.

The circulatory system is so intricate, so efficient, and also so reliant on other organs than just the heart, vessels, and blood, and in turn other organs rely on it. For a creature to live, every part must be there in its place and doing its specific job.

The circulatory system surely is a miracle, designed and created by a Hand Divine. Humans do not even have the ability to replicate the human heart, with its efficiency, durability, and reliability using their own materials.[23] How could we possibly assume that multiple mutations could produce this miracle?

True science points only to the Almighty God as the Creator and Master Designer of the amazing circulatory system.

Conclusion

We have discussed the operation of the heart and the function and composition of the blood vessels. Evolutionary "explanations" for the origin of this complex system have proved unsatisfactory and insupportable by any reasonable evidence. We are left with only one logical answer to the question of where the intricate circulatory system came from—the Almighty, Omniscient God created and designed it.

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[22] R. Monahan-Earley, A. M. Dvorak, & W. C. Aird, "Evolutionary origins of the blood vascular system and endothelium," *Journal of Thrombosis and Haemostasis* 11 (Suppl. 1):46-66, p. 63.

[23] Brad Harrub, "The Unevolvable Circulatory System," http://www.apologeticspress.org/apcontent.aspx?category=9&article=980 (Accessed April 20, 2020).

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