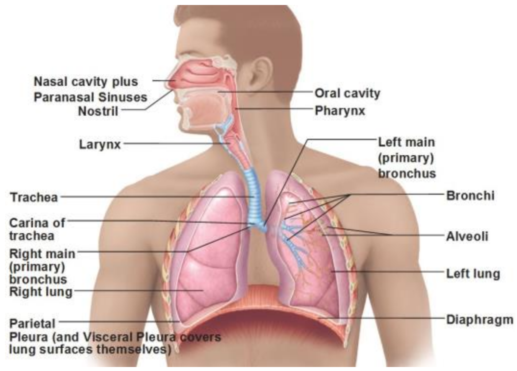
The Miracle of Breathing

Consider the way oxygen passes through our bodies. It begins with an involuntary action called breathing. Each breath starts when groups of electrical signals from the brain reach a muscle called the diaphragm. This muscle spans the lower part of our body above the abdomen. When activated, it moves downward, thereby lowering pressure within our lungs below that of the atmosphere (nominally 14.7 pounds per square inch). This pressure difference causes air to flow into our lungs so that the pressure may be equalized.

Diaphragm Boundaries

If we were to design this system, what would we need to know? For example, the forces generated within the diaphragm are successful in moving it downward only because its boundaries are fixed. The diaphragm is attached to our breastbone in the front, our spine in the rear, and to the inside of each of our lower three ribs on both sides. In order to specify the strength and location of electrical signals that are appropriate for breathing, we would need to know the size of the diaphragm, and just how far its muscle tissue moves in response to the incoming electrical signals. We would also need to know how much force can be applied at the points where it is attached along the breastbone, spine and ribs. Otherwise the diaphragm's motion might rip these points apart, and cause tissue to undergo self-destruction.



The Lungs

How large must the lungs be? That depends on the percentage of oxygen in the air, and the efficiency with which it passes through lung tissue and into the blood. For example, if our lungs were to pass one half their oxygen to the blood, they would only be 50 percent efficient. Our atmosphere has 21 percent oxygen by volume, and we typically breathe about 20 cubic feet of air daily. Lung tissue consists of about 600 million tiny sacs called "alveoli." Although each is only 4 thousandths of an inch in diameter, in total, they represent an area the size of a racket ball court. Each sac is a highly complex machine that processes air it receives from inside the lung, extracts the oxygen, and then passes the oxygen into the blood. The electrical signals, diaphragm muscle, lung tissue, skeletal structure, and the various properties of each including size, location, response, strength, and efficiency all must work in harmony with each of the others for the system to function properly.

Blood Requirements

In order to burn oxygen, we must get it to the cells. Oxygen isn't easily carried by a liquid. It prematurely burns by reacting with virtually everything that it contacts. This premature burning disables oxygen from being burned at its final destination in cells. But the blood that flows through our body is no ordinary liquid. It has truly remarkable properties that allow large quantities of oxygen to be transported from the lungs, and to countless billions of body cells.

The blood in each of our bodies contains about 30 trillion cells. These differ from normal body cells in that they have no nucleus (except when they first form). Each of these 30 trillion red blood cells have about 270 million very special, highly intricate chemical structures called "protein molecules." Totaling almost ten thousand million trillion, they each contain a ring that is composed of carbon, nitrogen and hydrogen. The rings are afloat in the blood stream, and a cluster of four iron atoms sits at the center of each of the rings. This cluster, in turn, provides a seat for two very privileged guests: a pair of oxygen atoms that sustain life by ultimately being burned in the cell they are destined to reach. But the cluster of iron atoms surrounds the oxygen in a way that protects it from premature burning until it reaches its final destination.

This incredibly designed molecule is called "hemoglobin," and it enables an amazing amount of oxygen to be carried from the lungs, and to the body cells by the blood. Were it not for the astounding orchestration of numerous electrical, mechanical and chemical properties that have been interwoven among trillions of these intricate, microscopic structures, our hearts would need to pump 50 thousand gallons of blood through our bodies each day at almost 5 times atmospheric pressure. Since our bodies disallow this, a change in blood fluid properties would necessitate changes in the electrical signals, diaphragm muscle, lung tissue, skeletal structure, and so forth.

Blood is carrying oxygen to our body cells at the present rate of about 2000 gallons per day. But if it were half this number, we would then need to readjust all of the other systems' parameters to satisfy the demand for oxygen by the cells. It would do us no good to change just one of the parameters, say, lung size or atmospheric oxygen content. The reason is that each system component is functionally related to all the others and quantitatively impacts the way they perform. A change anywhere means a change everywhere!

The Heart and Arteries

To specify the flow rate of blood, we must know the number, diameter and distribution of all the arteries. Our body has an arterial network which covers about 60,000 miles. As incredible as it sounds, a typical heart is just larger than a fist and weighs only eleven ounces. Yet, on average, it reliably pumps 2000 gallons of blood daily for over 70 years. A typical heart beats over 100,000 times each day. This totals about 2 billion beats in a lifetime. However, the rate at which these complex cycles of contractions and expansions occur is controlled by electrical signals from the brain. All these systems must work in perfect harmony for the human body to live.
(*Darwin's Dilemma* by Robert Gange, Ph.D)

You can choose which one to believe:

1) The diaphragm, lungs, blood, heart and arteries somehow work together by accident.
2) God designed these parts of the human body to work together as a unit for life to exist.