every Pico Second. Trained clinical technicians, can use varying wavelengths to target specific areas and colors on the skins surface. Different ink colors respond to different wavelengths, absorbing the light into the pigment and breaking it down. This light exchange causes a thermal reaction causing the ink to rapidly heat and combust into smaller particles. This process causes a 'frosting' effect on the skin, which is the break down of carbon from the ink and the releasing of carbon dioxide from the dermis. These particles are then eliminated from your body via your natural kick-ass immune system (white blood cells and lymph nodes) expelling them out of your body through your ordinary bodily functions like sweat, urination and excretion. Meaning that your technician is able to break the tattoo down for you, but it is up to your body to expel it.

Surgical removal of tissue with a laser is a physical process similar to industrial laser drilling. Carbon-dioxide lasers burn away tissue because their infrared beams are strongly absorbed by the water that makes up the bulk of living cells. A laser beam cauterizes the cuts, stopping bleeding in blood-rich tissues such as the female reproductive tract or the gums. Laser wavelengths near one micrometer can penetrate the eye, welding a detached retina back into place, or cutting internal membranes that often grow cloudy after cataract surgery. Less-intense laser pulses can destroy abnormal blood vessels that spread across the retina in patients suffering from diabetes, delaying the blindness often associated with the disease. Ophthalmologists surgically correct visual defects by removing tissue from the cornea, reshaping the transparent outer layer of the eye with intense ultraviolet pulses. Through the use of optical fibers similar to the tiny strands of glass that carry information in telephone systems, laser light can be delivered to places within the body that the beams could not otherwise reach. One important example involves threading a fiber through the urethra and into the kidney so that the end of the fiber can deliver intense laser pulses to kidney stones. The laser energy splits the stones into fragments small enough to pass through the urethra without requiring surgical incisions. Fibers also can be inserted through small incisions to deliver laser energy to precise spots in the knee joint during arthroscopic surgery.

**Conclusions.** Biophysics is aimed to promote professional integration in the field of biomedical visualization and physics used in biology, allowing for a better understanding of the physical principles of the methods used for diagnostic, therapeutic and basic medical and pharmaceutical research.

## THE ELECTRONICS AND MAGNITICS FIELDS IN THE HUMAN BODY

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**Introduction** The adult body is comprised from more than 70 trillion individual cells, and that's not counting the millions of bacteria we carry in our gut. Each of those trillions of cells carries out several thousand metabolic processes every second. In order for that level of complexity to function smoothly, there must be a great deal of communication between and within these trillions of cells. Thankfully, our cells are programmed for this type of communication, and are able to make changes in a fraction of a second when necessary; which is called the electromagnetic field.

The **aim** of this work is to get knowing the electric and magnetic processes running in the body and its helping to have good health.

**Materials and methods**. Bioelectricity, electric potentials and currents produced by within living organisms. Bioelectric potentials are generated by a variety of biological processes and generally range in strength from one to a few hundred millivolts. Inside human body there are atoms that are made up of positively charged protons, negatively charged electrons, and neutrons (which are neutral). An atom with unbalanced charges will become either positively or negatively charged, and the switch from one charge to the other allows electrons to flow from one atom to another. Your cells generate electrical charges via electrolytes like sodium and potassium applying a mechanism known as the sodium-potassium gate. When the membrane gate opens, sodium and potassium ions move freely into and out of the cell. Negatively charged potassium ions leave the cell, attracted to the positivity outside the membrane, and positively charged sodium ions enter it, moving toward the negative charge. The result is a switch in the concentrations

of the two types of ions. This flip between positive and negative generates an electrical impulse. This impulse triggers the gate on the next cell to open, creating another charge, and so on. In this way, an electrical impulse moves from a nerve in human stubbed toe to the part of his brain that senses pain.

Biomagnetism is the phenomenon of magnetic fields produced by living organisms. The human body produces complex electrical activity in different types of cells, including neurons, endocrine, and muscle cells. All of them were called "excitable cells". As all electricity does, this activity also creates a magnetic field. The biomagnetic fields of the body have been measured with techniques including magnetoencephalography (MEG) and magnetocardiography (MCG). These techniques measure the magnetic fields produced by the electrical activity in the body. The findings through objective basic research of these endogenous fields serves to determine their magnitudes as well as leading to the development of new non-invasive means of measuring cellular function. This is clinically useful in order to help guide treatment of the brain and heart. Cells normally go through at least 7,000 chemical reactions per second, which is an indication of the complex and continuous process involved in adaptation. This level of complexity is beyond the scope of simple biochemistry. By using electromagnetic stimulation, modern measuring techniques have increased the understanding of electromagnetic bio-communication that makes the coordination of the living system possible.

In medicine there is a kind of treatment, which rely on bio-electromagnetic fields calls acupuncture: In our bodies run bioelectricity that gives energy to all our organs which makes them function properly and balanced. This bioelectricity flows through meridians network, which is similar to the bloodstream. Meridians start of each finger of both hands, extending through the body and end up on the fingertips of the toes. When they flow, electricity flows free and all organs receive the energy they need for optimum performance. When energy cannot come to some organ, due to distortion of its work, disease occurs over time. There are a series of "circuit breakers" for all our vital organs and body parts, the hands and the soles. Head points are located on the fingers: brain, sinuses, eyes and ears. The upper part of the hand and the foot there are points for the upper body, and the lower part of the hand and the foot are for the lower body.

Principe of work. When inserting and stimulating a needle in a particular location, fascial tissue cells called fibroblasts are stressed, releasing ATP, electricity. This travels through the fascial network, allowing communication and signaling to other cells, which in turn affect all the other systems of the body. Most importantly affecting the nervous system, cardiovascular, and endocrine. The location of needle insertion and the stimulation determine how and where the therapeutic effect will take place. Acupuncture works via the embryological system, effecting cellular communication and organization. It is working with the mechanisms that directly affect cellular respiration, repair and organization. At this cellular level it stimulates a therapeutic effect. This can manifest as analgesic pain relief, increased blood flow, nervous system response, and hormonal release.

**Results and discussion.** Living cells are electromagnetic units including human, animal and plants. Our whole-body cells, tissues or organisms, sense of smell, visionary system, heart functions, endocrine system, nervous system, metabolism system work under Bio-electromagnetism.

Our brain is the hub of our nervous system. It is made up of 100 billion nerve cells. Each cell is connected to around 10,000 others. So, the total number of connections in our brain is around 1000 trillion. Our nervous system is a network of cells called neurons which transmit information in the form of electrical signals. Neurons communicate with each other at special junctions where chemicals help to bridge the gap between one neuron and the next. We know that when electricity passes through a metal it causes a magnetic field. In a similar way, human electricity in the brain and nervous system creates magnetic fields around our body. The human heart is a source of electro-magnetism at a few meters away, is detectable by modern scientific instruments**.** Electric force can transform into different types of energy waves, such as heat, radiation, radio and microwaves and these energy waves can travel a long distance.

**Conclusions.** As we have seen in this work, the processes of the electromagnetic fields are very important for organs work as the brain and heart. In medicine this mechanism can be applied by the acupuncture technic to keep the biological systems healthy as the blood flow, nervous system response, and hormonal release.