

Bioelectrical signals

a grp of cells nerve & muscle cells

cardiac exert electrical signals
muscle naturally

cell membrane potential - stimuli (*electric*) - excited - pass threshold - action potential - generate electric field

EMG, EOG, ERG

Bio-acoustic signals

sounds from the human body as it functions, giving information of the body's inner condition

lung (*breathing*), heart (*blood flow*), bowel, joint (*bone cracking*)

noninvasive and easy way of examination

sound sensor apparatus receive the bio-acoustic signals

Biomechanical signals

movement motion & displacement signals, pressure & flow system

skeletal muscles movement of the limbs

chest wall movement of chest - respiratory activity - examine rib cage injury

Bio-optic signals

light change in optical properties

alive cells = emit light energy dead cells = no emit light energy

blood oxygenation measure the transmitted light from cells at different wavelengths

reflection or pulse rate by the change in skin color

Biochemical signals

measurement of the chemicals in the body directly from the living cells or in the form of samples

CO₂, O₂, ion conc, hormones, signaling & receptor pathways

signaling interactions & processing cellular information

checks the ability of cells to recognize and respond to the changes in their environment homeostasis, immunity, repair, development

error leads to disease cancer, autoimmunity, diabetes

Bio-magnetic signal

weak magnetic fields

specifically brain, lung, heart other organs also produce - but too weak - these organs work nonstop - slightly more stronger magnetic field

measur-ment taken in a magnetic shielded room exclude *most* external disturbances

detector called SQUID superconducting quantum interference device

Bio-impedance signals

impedance = resistance

implication of weak electrical current - travel thru the cells and tissue - measure the voltage drop generated = impedance of the body

measure body composition