

Circuit of Life

The brain is the most complex organ in the human body. It exerts centralised control over the other organs by rapid and coordinated responses through the neuronal circuit. The brain circuit travels up and down the neuroaxis, from right to left brain and vice versa, back and forth from all parts of the brain at different levels within the thalamus, hypothalamus, forebrain, midbrain, medulla, cerebellum, and spinal cord. The circuit is very complex and vital for life. It is composed of approximately 100 billion neurons that are electrically excitable and are interconnected by trillions of connections called synapses. Each of the neurons are interconnected with an average of 7,000 synaptic connections, forming simple to complex neural networks. Through these circuits, their activities can be stimulated or inhibited to process incoming information and carry out a response. The synaptic signalling system processes and transmits information through electrical and chemical signals. Information is rapidly transmitted over long distances through these signals. On average, each connection transmits about one signal per second. Their discharge patterns vary from regular spiking to fire in bursts to high firing rates. During the process, a single neuron generates 0.05 volts of electricity and all neurons together can generate enough electricity to power a 40-watt bulb.

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