

**ALPHABETICAL BRAIN™ VOCABULARY
DETAILS ABOUT YOUR CONNECTOME
Brain Flash Card #9/April 15, 2016**

BRAIN SCIENCE FACTS

WHAT IS YOUR CONNECTOME AND WHY IS IT SO IMPORTANT?

What is the purpose and function of your connectome? The word connectome describes the biological structure of the three-dimensional communication network that connects your brain to the rest of your body.

You can easily learn more about your own overall connectome network and the smaller specialized connectome control circuits consisting of many cortical connectomes and neural connectomes.

It is now known empirically that your connectome network consists of an extremely complex biochemical communication system whose intricate interactive structure and functions took more than two centuries of careful scientific investigation and creative experimentation to discover.

It is helpful to simplify the most complex three pounds of matter in the universe (your brain) by integrating the idea of your connectome with the overall concept of the global connectivity of your brain's structures and their functions.

You can explore how the new brain idea connectome relates to the new brain idea of your brain's global connectivity by momentarily focusing your attention on the following global connectivity by momentarily focusing your attention on the following circular symbol and the #9 red arrow:

**THIS SYMBOL REPRESENTS A
SIMPLIFIED HOLISTIC VIEW OF THE
GLOBAL CONNECTIVITY NECESSARY
FOR HUMAN CONSCIOUSNESS**

This circular symbol was created to convey a powerful visual image of the previously unimaginable coalescence of the many diverse and interactive physical brain structures that form the wonderful new idea of your self-manifesting holistic brain.

The symbol of 14 red arrows pointing toward the circle of human consciousness, depicts an entity (a conscious living human brain) made up of many parts with a sum total of meaning that is greater than all of its separate parts.

Each of the 15 primary brain ideas in the image, which are emphasized on this website, can converge and merge in your mind to produce the mental force (brainpower) that can empower you to stand up for your self-beliefs.

The massive complexity of your connectome circuit structures makes possible your brain's plasticity and, therefore, your own infinite adaptability.

THE COMPLEXITY OF YOUR CONNECTOME MAKES POSSIBLE YOUR BRAIN'S ADAPTABILITY

Historically, your biochemical connectome network was simply called your brain and brainstem and spinal cord without a detailed explanation of how the biological communication system actually worked at the molecular level.

Now the microscopic functions of the ions, whether polarized, depolarized, or re-polarized in the zillions of molecules of your 100 billion neurons and 900 trillion synapses are understood well enough by brain scientists and described clear enough so you can learn about them and cope better every day during the rest of your unique life.

In addition, the smaller connectome circuits within the larger connectome network have a variety of specialized functions that make possible an infinite number of possible connections among your 100 billion neurons. The smaller cortical and neural connectome circuits can activate a vast number of diverse movements that you are capable of performing under normal circumstances.

Now there is a definitive scientific understanding of the quantum effects of the interactive biochemical connection between your brain and your spinal cord at the molecular level.

Therefore, the purpose of your whole overall connectome network and the smaller specialized connectome circuits is to make possible your unique consciousness and your adaptable sense of self (self-awareness).

This gives you the capacity to change your attitudes and behaviors, including habits, whenever you are challenged by environmental conditions, whether they are geological, cultural, social or personal.

The intricate neural communication function of your connectome network includes all of the 900 trillion synapses that function as junctions (biochemical switches).

Your synapses attach your 100 billion neurons to each other through biochemical signals or impulses of information.

They activate your senses and control your muscles by sending and receiving ionic currents (signals/impulses) all around your brain and throughout your body.

However, the ionic currents move in only one direction in each neural pathway and have functionally paired sensory and motor neuron pathways either going to your brain or coming from your brain within your nerve tracts.

This interactive neuronal communication system has two kinds of primary nerve tracts inside your nervous system.

One is known as your central nervous system (CNS), which consists of your brain and spinal

cord.

The other is your peripheral nervous system (PNS), which consists of the spinal and cranial nerves that connect your brain and spinal cord to the rest of your body.

Your PNS is responsible for the functions of your autonomic nervous system, including your fight, flight, or freeze bodily response to either real danger or imagined dangers.

Either real or imagined dangers can activate the same biochemicals that are the cause of your negative feelings, including anger, anxiety, apathy, depression, and fear.

You can easily learn how to respond to excessive harmful stress with the "relaxation response," which is a learnable cognitive self-help skill that can calm your emotions and reduce your blood pressure.

To achieve this result, you can reprogram your PNS by using the executive function of your prefrontal cortex (PFC) through rational mindfulness techniques (focused meditation) to control your limbic system by emphasizing your positive feelings of happiness and empathic respect (love).

By learning how your thoughts can control your feelings, you can maximize your pleasure and happiness in all normal situations and minimize unhealthy chronic stress by balancing the inputs from both your CNS and PNS nerve tracts.

In order to better understand brain functions, brain scientists separate the human brain into functional regions through various mapping strategies by first using obvious membranes as borders to designate specific functional brain areas.

Then the researchers watch on functional magnetic resonance imaging (fMRI) machines to observe which brain regions or areas light up on the computer screen when a higher amount of brain sugar is metabolized or increased blood flow is activated in specific brain areas as research subjects (people) are thinking or feeling different things.

To review, you have cortical (larger regional) connectomes and neural (smaller area) connectomes, which connect the tens of billions of neurons in your cerebral cortex to the tens of billions of neurons in your spinal cord and to the many specialized functional regions of your brain.

It is essential to remember that your connectome network connects all your senses and all your internal organs and all the neural fibers in the neural pathways inside the nerve tracts of your central nervous system (CNS) and also your peripheral nervous system (PNS), which have complementary systems of connecting your brain to your body.

However, they can be in conflict sometimes which is a subject discussed under many other brain ideas!

Also it is important to always remember that your many connectome circuits are part of an incredible parallel processing biochemical communication system that makes possible your unique free will and makes possible the vast variety of your potential mental and physical behaviors.

Therefore, brain scientists have clearly established that your free will (willpower) is caused by the ions (isotopes of electrons) that move or "jump" among the layers of neural pathways of the microscopic three-dimensional structure of your extremely complex connectome system.

To begin to understand what your connectome network can do for you, think of an "electrical wiring" metaphor, but realize that your brain circuitry is far more adaptable than any current industrial or household electrical wiring circuits known, even those inside digital devices.

The new scientific understanding of your brain's plasticity or adaptability is not defined by the historic Newtonian laws of physics.

That is because the biochemical communication structure of your brain and nervous system function with quantum effects that produce the reality of flexible adaptive human behavior.

Fundamentally, your power to freely choose among alternative behaviors and values is caused by your biological brain tissue interacting with your current social and cultural influences, with a strong influence mediated by your language skills and your past memories.

Your brainpower is yours alone to learn how to activate and it does not require magical thinking to substantiate its relevance in the world.

Your brainpower does not depend on the worship of any imaginary invisible gods or goddesses or mythical beings who are abstract symbolic representations of human thoughts and feelings.

The fact that your biochemical communication system can strengthen its own signaling connections in your 900 trillion synapses and your 100 billion neurons and thus form memories that assist your survival is a profound realization of evolutionary science that you can now appreciate in its true humanistic linguistic context.

The reinforcement of the biochemical signals (in all of the neural pathways inside your nerve tracts up and down from your head to your toes) creates the memories that allow you to remember who you are and all of the important events and experiences that you need to remember for future purpose and meaning in life.

For example, the system can carry millions to billions of neural signals from the neurons in your brain's motor cortex to stimulate the muscles that cause the movements of your body.

And your intricate biochemical communication system can "remember" (by strengthening the neural signaling process) the bodily movements you repeatedly practice in order to make them habits.

Your connectome network also sends biochemical signals to other functional regions of your brain to stimulate other reactions such as your mirror neurons when you need to imagine what other people are thinking.

For example, in the case of your mirror neurons, it was vital in the context of human evolution (from prehistoric proto-humans to early homo sapiens) that prehistoric people were able to predict or imagine whether or not strangers coming toward them were likely to become aggressive and combative or be peaceful.

People needed an early warning system to save them from dangerous intruders, which is assumed to be the reason that mirror neurons evolved, so they could observe at a distance the body language (expressive emotions) of any strangers.

Mirror neurons have now evolved enough to be involved in all of your experiences of love, empathy, cooperation, and collaboration with those whom you like to share good positive feelings.

Finally, it is important to remember that your total connectome network was organized by evolutionary forces over a long period of time of hundreds of thousands of years!

It took that long for the prefrontal cortices and limbic systems of the brains of human beings to become synchronized so they could work together to create the enormous brainpower of our typical human brains today.

When you focus on your own consciousness and your sense of self (self-awareness) in this humanistic perspective, you will be able to plan better goals to achieve more predictable and reasonable future outcomes in your personal and social life and in general to continue to adapt to any changes in the environmental conditions of nature.

Now you can choose to take advantage of the new brain wisdom to learn how your consciousness can work harmoniously together with your memories (from childhood through adolescence and your emergence as an adult) so you will feel increased self-acceptance, higher self-esteem, and be more empathic (loving) when you relate to others.

As you become progressively more successful in achieving your career or vocational goals or retirement wishes on your quest to achieve your self-actualization needs (as you seek safety, comfort, love, and happiness), you will be able to share your humanistic ideas (cognitive reality) and ideals (values) with others for living a more predictably fulfilling life in a changing and complicated world.

RECOMMENDATION: Print this PDF version and read it. Underline or highlight with colors the most important new brain ideas to save them in your long-term memory. Then read your mashup of these ideas in a few hours and then in a few days to take advantage of the spaced-repetition method of learning.