VETERINARY COMPENDIUM

Glossary - The Science Behind Light Touch

The glossary was prepared by authors Carol M. Davis and Tuulia Luomala. Visit The Science Behind Light Touch Community Gathering to learn more.

SKIN AND FASCIAL CELLS

Merkel cells: Specialized skin cells involved in the sensation of light touch.

Fibroblasts: Cells that produce collagen and other fibers, playing a key role in wound healing and tissue repair.

Telocytes: A type of cell found in fascia and various tissues, thought to help in tissue repair and communication between cells.

Integrins: Proteins on cell surfaces that help cells attach to and communicate with their surroundings, playing roles in cell movement and signaling.

Cytoskeletal network: A network of fibers within cells that provides structure, helps with movement, and plays a role in cell division.

FASCIAL TISSUES

Fascia: A body wide continuous network of connective tissue that surrounds and supports all tissues within the body, including muscles, bones, and organs.

Collagen: Proteins that form strong, flexible fibers, providing structure and strength to skin, bones, and connective tissue.

Collagen synthesis: The process by which the body produces collagen from fibroblasts, essential for tissue repair and maintenance.

Interstitium: A fluid-filled space within tissues and surrounding all organs, providing a support structure and involved in nutrient transport and cellular communication.

Extracellular matrix: A fluid network of proteins and other molecules outside cells that provide structural support and influence cell behavior. The major element of the fascial web.

Glycosaminoglycan type II ground substance: A component of the extracellular matrix of fascia that helps to maintain tissue hydration and elasticity.

Biotensegrity (biotensegral model): A model describing the body as a system of interconnected parts that maintain structural integrity through the sum of a balance of constant tension and intermittent compression.

PHYSIOLOGICAL PROCESSES

Homeostasis: The body's process of maintaining a stable internal environment, such as temperature and pH, despite external changes.

Precision-based phase: A phase in which a system responds to very specific and small stimuli or changes.

Force magnitude-based phase: A phase where the system responds to the overall strength or magnitude of a force.

Dual negative feedback mechanism: A regulatory system where two processes work together to maintain balance, each one inhibiting the other to stabilize a system.

Immune system: The body's defense system that protects against harmful invaders like bacteria, viruses, and other pathogens. Fascia serves as one component of the immune system.

Microcosms: The tiny, detailed world of small things, often referring to anything microscopic or the universe on a small scale.

Macrocosms: The large-scale universe or the entire cosmos, encompassing everything that exists.

NEURAL MECHANISMS

Interoception: The sense of the somatic and emotional internal state of the body, including hunger, thirst, heart rate, fear, love.

Mechanoreceptors: Sensory receptors on the cell membrane that respond to mechanical pressure or distortion, such as touch or sound.

Mechanotransduction: The process by which cells sense and respond to mechanical stimuli by converting them into biochemical signals.

Proprioception: The sense that allows you to know the position and movement of your body parts without looking at them.

Nociception: The process by which painful stimuli are detected by the nervous system.

Nociceptive circuitry: The network of neurons responsible for detecting and processing pain signals.

C-tactile fibers: Nerve fibers throughout the fascia of the entire body that respond to gentle, slow touch and are associated with the emotional feeling of being touched.

Schwann cells: Cells that form the myelin sheath around nerves, helping to speed up the transmission of nerve impulses.

Dorsal root ganglion cells: Clusters of nerve cells near the spine that carry sensory signals to the brain.

Interneurons: Neurons that connect other neurons within the brain or spinal cord, playing key roles in communication and reflexes.

Autonomic nervous system (ANS): The part of the nervous system made up of the sympathetic and parasympathetic nerves that controls involuntary actions like heart rate, digestion, and breathing.

Vagus nerve: A major cranial nerve (plexus) that controls various functions in the heart, lungs, and digestive tract, and plays a role in the body's relaxation response.

Polyvagal theory: A theory about how the vagus nerve influences emotional regulation, social behavior, and stress responses.

Glomerular synaptic arrangements: Specific structures in the brain where nerve signals are transmitted in a bundle or network, such as in the olfactory system.

ENERGERTIC MECHANISMS

Intention: The mental state of planning or aiming to achieve something.

Subtle energy: Subtle energy refers to photons and electrons as quantum energy. In our bodies, for example, the stimulus of an acupuncture point can be detected from the bottom of the foot to the brain faster than neural transmission—a phenomenon known as quantum speed (Oschman J., 2016).

Electrical energy: The body is electrically charged. The charge of a cell can be altered by ion pumps and concentration gradients.

Electroencephalogram (EEG) and electrocardiogram (EKG): Technology used to measure electrical activity or the brain and heart, respectively.

Electromagnetic energy: Sunlight, which enters the body as photons is absorbed into molecules with the tissues, is an example of electromagnetic energy.

Electromagnetic field: An invisible force field created by electrically charged objects, like magnets or antennas, which can push or pull on other objects and is responsible for things like light, radio waves, and the way magnets attract or repel each other.

Energy field: A region in space where a particular force, like gravity or magnetism, influences objects or particles.

Biofield: The biofield is an electromagnetic field that surrounds the body in a three-dimensional way.

Energy pathway: Energy pathways can be understood as meridians (in traditional Chinese medicine) or Nadis (in Ayurvedic tradition).

Lines: In general, lines are straight, continuous paths that extend infinitely in both directions without thickness; in specific contexts, they may refer to electrical or magnetic field lines, among others. There are no straight lines in living material, when examined closely.

Local field: Local fields interact with global biofields. These are like vortexes where biophysical energy concentrates such as the central column of chakras in Ayuvedic philosophy.

Quantum field: A fundamental concept in physics where fields, like the electromagnetic field, the zero-point field, exist everywhere, and particles are seen as excitations of these fields.

Gravity: The natural force that pulls objects toward one another, keeping planets in orbit and making things fall to the ground. One of the four fundamental forces of nature (gravity, electromagnetism, strong and weak nuclear forces.

BIOMECHANICAL MECHANISMS

Tissue compliance: The ability of tissue to stretch and return to its original shape.

Viscous compliance: A property of materials or tissues that describes how they slowly deform and return to shape when subjected to stress.

Velocity: The speed of something in a specific direction.

Strain: Lengthening or deformation of a tissue when a load is applied.

Strain energy: The energy stored in a material as it is deformed.

Force magnitude: The overall amplitude or amount of a force acting on an object or structure.

Stress: The amount of force applied to a material per unit area.

Stress-strain curve: A graph that shows how a material deforms (strain) under stress and how it recovers. Hard matter demonstrates a different curve than soft matter.

Piezoelectric receptors: Sensors that convert mechanical stress into electrical signals, often found in biological tissues.

Piezoelectric pressure: Pressure that generates an electrical charge in certain materials, particularly bone and the extracellular matrix of fascia.

Piezoelectricity: The electric charge that accumulates in certain materials when they are mechanically stressed.

Resonance: The phenomenon where an object or system vibrates with greater amplitude at certain frequencies, often matching an external frequency. When two

waves come together to make a combined wave, they are said to be in resonance.

PATHOLOGIC MECHANISMS

Chronic fatigue syndrome (CFS): A long-term condition characterized by extreme fatigue that doesn't improve with rest and can't be explained by an underlying medical condition.

Myalgic encephalomyelitis (ME): A severe, long-term illness that affects many body systems, causing profound fatigue, pain, and cognitive problems.

Dysautonomia: A disorder of the autonomic nervous system, leading to issues with heart rate, blood pressure, and other involuntary functions.

Postural orthostatic tachycardia syndrome (POTS): A condition where the heart rate increases abnormally upon standing, causing dizziness, fainting, and other symptoms.