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Cellular Communication Vocabulary Crossword Match the word to the definition.

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| **Across**  **4.** Messenger of neurologic information from one cell to another.  **5.** Occurs when endocrine cells release hormones that act on distant target cells in the body.  **16.** Monetary value of all the finished goods and services produced within a country's borders in a specific time period.  **18.** Process of programmed cell death that occurs in multicellular organisms.  **19.** System of stimuli and response correlated to population density.  **24.** Generated by one of the enzymes in the citric acid cycle.  **27.** Guanine nucleotide-binding proteins, are a family of proteins that act as molecular switches inside cells, and are involved in transmitting signals from a variety of stimuli outside a cell to its interior.  **28.** Crucial regulators of many key signaling pathways.  **29.** Molecules that relay signals received at receptors on the cell surface — such as the arrival of protein hormones, growth factors, etc. — to target molecules in the cytosol and/or nucleus. | **Down**  **1.** Process by which foreign DNA is introduced into a cell by a virus or viral vector.  **2.** A set of chemical reactions in a cell that occurs when a molecule, such as a hormone, attaches to a receptor on the cell membrane.  **3.** Strengthening of stimulus energy during transduction.  **6.** Ionotropic receptors, are a group of transmembrane ion channel proteins which open to allow ions such as Na+, K+, Ca2+, and/or Cl− to pass through the membrane in response to the binding of a chemical messenger, such as a neurotransmitter.  **7.** The high-affinity cell surface receptors for many polypeptide growth factors, cytokines, and hormones.  **8.** Seven-transmembrane domain receptors, 7TM receptors, heptahelical receptors, serpentine receptor, and G protein–linked receptors (GPLR), constitute a large protein family of receptors, that detect molecules outside the cell and activate internal signal transduction pathways and, ultimately, cellular responses.  **9.** Similar to paracrine signaling but there is a special structure called the synapse between the cell originating and the cell receiving the signal.  **10.** Sequence of events where one enzyme phosphorylates another, causing a chain reaction leading to the phosphorylation of thousands of proteins.  **11.** An enzyme that removes a phosphate group from the phosphorylated amino acid residue of its substrate protein.  **12.** Convert (a substance, molecule, etc.) into a reactive form.  **13.** Form of cell-to-cell communication in which a cell produces a signal to induce changes in nearby cells, altering the behavior or differentiation of those cells.  **14.** The transferring of phosphoryl group from a donor to the recipient molecule.  **15.** A common biochemical process in which a phosphate group is removed from an organic compound through hydrolysis.  **17.** The bulging out of a part of a cell below the plasma membrane or expansion of air-filled tissue, as occurs in the lungs in bullous emphysema.  **20.** Target cell's detection of a signal via binding of a signaling molecule, or ligand.  **21.** Kinase enzyme that modifies other proteins by chemically adding phosphate groups to them (phosphorylation).  **22.** Any behavior of a living organism that results from an external or internal stimulus.  **23.** Can control different processes in the cell including the cell cycle.  **25.** A chemical substance produced in the body that controls and regulates the activity of certain cells or organs.  **26.** Substance that forms a complex with a biomolecule to serve a biological purpose. |