**Gene Editing and Transgenesis Activity Definitions**

* ***Agrobacterium***: Agrobacterium is a bacteria species that is very common in the soil. It is a virulent plant pathogen that is able to transfer its own genes into plant cells to cause tumors that feed the bacterium and allow it to reproduce. Because it is able to transfer DNA from itself into plants, it has become very important in genetic modification. Scientists are able to “disarm” the bacteria by removing the tumor inducing components of its existing DNA, insert new DNA associated with a specific trait, and use its existing mechanism to insert this new DNA into plant cells. This mechanism ensures that the new DNA is inserted into the nucleus of the cell without impacting other cellular processes.
* ***CRISPR/Cas 9***: Researchers create a small piece of RNA with a short "guide" sequence that attaches (binds) to a specific target sequence of DNA in a genome. The RNA also binds to the Cas9 enzyme. As in bacteria, the modified RNA is used to recognize the DNA sequence, and the Cas9 enzyme cuts the DNA at the targeted location. Once the DNA is cut, researchers use the cell's own DNA repair machinery to add or delete pieces of genetic material, or to make changes to the DNA by replacing an existing segment with a customized DNA sequence.
* ***DNA*:** deoxyribonucleic acid, a self-replicating material which is present in nearly all living organisms as the main constituent of chromosomes. It is the carrier of genetic information. *DNA* is made up of amino acids (represented as A, C, G, T). Amino acids are made of 3 nucleotides. For this activity, the DNA for each of the 3 genes will consist of 9 amino acids (27 nucleotides).
* ***Gene***: a unit of heredity which is transferred from a parent to offspring and is held to determine some characteristic of the offspring; a distinct sequence of nucleotides forming part of a chromosome
* ***Gene editing***: refers to a group of technologies that give scientists the ability to change an organism's DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome. CRISPR/Cas 9 is one of the technologies used in gene editing.
* ***Gene gun****:*The gene gun is a modified shot gun that is used insert or transfer DNA into a plant cell by bombarding plant cells in a petri dish with millions of gold particles that are coated with hundreds of copies of DNA associated with the trait of interest. This device was first developed in 1984. Where the DNA is inserted in the cell using the method is random; it may not be inserted into the nucleus and therefore will not be successful. If the particles are successfully inserted into the nucleus of the cell, the DNA dissolves off of the gold material and can potentially insert into the chromosome.
* ***Gene pool***: sum of a population’s genetic material at a given time. The term typically is used in reference to a population made up of individuals of the same species and includes all genes and combinations of genes in the population.
* ***RNA***: ribonucleic acid, a nucleic acid present in all living cells. Its principal role is to act as a messenger carrying instructions from DNA for controlling the synthesis of proteins. *RNA* is made up of amino acids (represented as A, C, G, U).
* ***Trait***: a genetically determined characteristic; a distinguishing quality or characteristic, typically one belonging to a person