Instructional Terminology

BIOSCIENCE 41.0100.00

%,1,2,3

% M/V (Percent Mass Volume) - A type of concentration where the amount of mass is expressed as a percent of the total volume

1st Stop - the position the micropipette plunger is depressed to in order to dispense the specified volume of air in order to fill the tip with that volume of liquid when the plunger is released

2nd Stop - the position the micropipette plunger is depressed to in order to dispense the liquid in the tip

A

Absorbance - A measurement of the amount of light that does not pass through (is absorbed by) a sample (unit is au - absorbance unit)

Absorbent Material - Used to collect spilled liquids and contain them, similar to a how a sponge soaks up water

Abstract - A summary of the crucial factors of a paper designed to give the audience a complete but concise understanding of the research.

Acid - A solution with a pH below 7, having a high concentration of hydrogen ions than hydroxide ions

Acidic buffer - Often a conjugate acid of a weak base, the OH- are neutralized by the acid in the buffer.

Acid Base Indicator - A chemical compound that is added in small amounts to a solution so that the pH of the solution can be determined easily. Normally causing the color change of the solution depending on the pH.

ADEQ - Arizona Department of Environmental Quality- responsible for state environmental laws and certain federal programs to prevent air, water, and land pollution as well as clean up.

Affinity Chromatography - Separation of molecules based on specific interactions between: antigen and antibody, enzyme and substrate, or receptor and ligand

Agar - A type of polysaccharide from algae used to solidify growth media

Agarose - A carbohydrate derived from seaweed which is the structural ingredient in the gel that supports the separating of biological molecules.

Aliquot - To distribute a specific volume of liquid

Alignment - In biotechnology, alignment is the way of arranging sequences of DNA, RNA, or proteins to examine how similar they are to other known samples.

Alternative Splicing - Process by which mRNA is cut into fragments and some fragments are reconnected. A single gene can code for multiple proteins when rearranged and organized differently.

Amino Acid - A type of molecule that combines to form proteins. Made of a carboxyl group (-COOH), amino group (-NH2), and an R group.

Analysis - Interpretation of data and observations.

Analytical Balance - A sensitive device that determines the mass of a substance in milligrams

This Instructional Terminology is aligned to both the Program Blueprint for Instruction & Assessment as well as the Instructional Framework. It corresponds with the technical standards adopted on July 28, 2021. Use of content-specific terminology is provided to help identify consistent definitions.

Annealing Stage (PCR) - The second stage of PCR when lower temperature allow the primer to bond to the template DNA

Annealing Temperature - Allows the primers to bind with the template.

Anode - An electrode that has a positive charge and is the source of electrons in an electrophoresis box

Antibody/Immunoglobulin - Proteins made by the immune system in response to antigens

Antibiotic Resistance - When microorganisms are able to develop defenses against antibiotics utilized to destroy them.

Antigen - A substance that generally evokes an immune response in an organism when bound by an antibody

Antiparallel - The strands run in opposite directions.

Antilogarithm - An expression in which the number calculated is the logarithm. Also referred to as antilog.

Antiparallel - Strands of molecules (DNA or RNA) that are complementary and aligned in opposite directions

Aseptic Technique - A set of practices and procedures that control sample growth and prevent contamination.

Assay - A test to determine the quality or quantity of a sample

Autoclave - An instrument used to sterilize equipment and supplies by exposing them to high pressure saturated steam for a period of time.

Autoionization - A chemical reaction in which a proton is transferred from one water molecule to another. This can occur in pure water or an aqueous (liquid) solution and creates the two molecules, hydronium (H_3O^+) and hydroxide (OH^-).

Autorad - The process of using x-ray film that has been exposed to radioactive material.

AZDEQ (Arizona Department of Environmental Quality) - A government agency that oversees the planning, permitting, and compliance of the state's environmental laws

B

Bacterial Colony - A visible cluster of bacteria that was cultured from the same original bacterial cell.

Bacterial Lawn - Continuous growth of bacteria on a growth media, making individual colonies difficult to identify.

Bacteriological media - A substance used to support the growth of bacteria.

Band - A mass of DNA or protein in a gel after electrophoresis has occurred, only visible if a stain is used

Bar Graph - graphs that make comparisons between different groups

Base - A solution with a pH above 7, having a lower concentration of hydrogen ion than hydroxide ions

BLAST (Basic Local Alignment Search Tool) - An algorithm used for calculating sequence similarities between samples, such as nucleotide sequences of DNA and amino acids sequence of proteins.

Basic buffer - Often a conjugate base of a weak acid, the H+ are neutralized by the base in the buffer.

Beakers - Glassware with uniform shape from top to bottom. Not as accurate as the graduated cylinders and volumetric flasks. These should not be used when accurate measurements are needed

Beef extract - A mixture of protein, fat and sugars taken from beef.

Beer's Law - If a solute absorbs light at a particular wavelength, the absorbance is directly proportional to the concentration of the solution.

Biasness - A prejudice for or against a thing, person, or group compared to another, often considered unfair.

Bioassay - A test to measure the effects of a substance on an organism.

Bioethics - A discipline dealing with the ethical implications of biological research and its applications.

Bioinformatics - The science of collecting and analyzing complex biological data using software and computers.

Biohazard - Any agent that poses a safety hazard to biological entities

Biological - A specimen that is related to biology or living organism, does not have to be currently living

Biological Safety Cabinet - An enclosed, ventilated workspace for safely of user working with materials contaminated with (or potentially contaminated with) pathogens

Biological Stain- Dye that is used to better visualize the features of a microscopic specimen

Biosafety - safety procedures associated with research and production of biological products

Biosafety Level (BSL) - A defined set of regulations a laboratory is held to based on the biohazard potential of the agents they utilize

BACE (Biotechnician Assistant Credentialing Exam) - An industry-recognized certification for entry-level employment in a bioscience field. The credential is valid for 5 years after completion.

Biotechnology - the study and manipulation of living things or their component molecules, cells, tissues, or organs.

Biuret Assay - A method used to detect peptide bonds in the presence of a copper ion. The sample changes from blue to purple depending on the amount present.

Blank - A solution of solvent or diluent that does not contain the analyte, used to zero a spectrophotometer

BLAST (Basic Local Alignment Search Tool) - An online software that compares a nucleotide or protein sequence to a database and determines the statistical significance

Blue Litmus Paper - Changes to red in acidic solution.

Blunt End - The result of a restriction digest using an enzyme that cuts a double stranded nucleic acid in same places on the complementary strands

Bradford Assay - A method using Coomassie Blue stain, which changes color between brown, blue and purple depending on the amount of protein present. Very sensitive.

Broth - A liquid growth media

Bronsted Lowry Acid - A molecule that donates protons.

Bronsted Lowry Base - A molecule that accepts protons.

BSL 1 - Agents shown to not regularly cause disease in a healthy adult

BSL 2 - Agents associated with human disease from broken skin, ingestion or mucous membrane exposure

BSL 3 - Indigenous or exotic pathogenic agents with potential air transmission, disease may have lethal consequences

BSL 4 - Dangerous/exotic agents with high rate of mortality, any and all modes of transmission

Buffer - A solution that resists a change in pH when an acid or base is added to it

Buffer Capacity - The amount of an acid or base that can be added to a volume of a buffer solution before its pH changes significantly.

C

Calibration - The process of adjusting and configuring a piece of equipment to a known measurement.

Cathode - An electrode that has a negative charge and attracts the electrons in an electrophoresis box

Cell Line - These are immortal cells that continue to divide indefinitely. There are a variety of cell lines that are used in research.

Cellular respiration - A process when cells harvest the chemical energy stored in food and turn it into directly usable energy

Central Dogma of Molecular Biology - A theory which states that genetic information flows in one direction: from DNA, to RNA, to a protein.

Centrifuge - A piece of equipment that spins samples at a high rate of rotation in order to separate solids from liquids or liquids of differing densities

Centrifugation - A technique used to separate molecules based on their size by high speed spinning.

CFU (Colony forming units) - A way to determine the number of living bacteria cells in a sample.
cGMP (Current Good Manufacturing Practice) - Regulations provided by the FDA that focuses on the appropriate design, monitoring and control of manufacturing processes

CHO - Chinese hamster ovary cells

Chemical - A substance with a definite molecular composition that is produced by or used in chemical reactions

Chloroplast DNA (cpDNA) - A type of double stranded DNA that is found in the chloroplasts of plant cells. It can be straight or circular in shape and has different DNA than that of the nucleus.

Chromosome - A highly condensed structure found inside cells consisting of organized DNA molecules and packaging proteins called histones.

Chromosomal Locus - A specific location on a chromosome, where VNTRs can be found in the genome.

CIP (Common Industry Practice) - Techniques and methods generally accepted by the majority of an industry

Code of Conduct - A policy within a company or organization that outlines the principles and standards that all employees must follow within their capacity as employees.

Codon - A sequence of three nucleotides in DNA or RNA which link with a molecule of tRNA holding a specific amino acid.

Column Chromatography - A method of separating components of a mixture by differential movement through a matrix.

Column/Bar Graph - A visual model of data comparing categories on a like topic with bars

Copy Number Variation - Sections of the genome are repeated, often varying between individuals and families.

Copyright - A license that grants specific types intellectual property, such as written, artistic, educational, or musical, protection from being used without permission.

Comb - A piece of plastic used to create wells in a gel

Combined DNA Index System (CODIS) - Software utilized nationally which integrates databases of forensic samples for analysis and identification.

Complementary Base Pairing - A purine (A or G) and a pyrimidine (T, G, or U in RNA) connected by a hydrogen bond.

Complementary DNA (cDNA) - A type of DNA that is made from an mRNA molecule. This type of DNA can occur naturally or synthetically.

Concentration - The ratio of solute in a solution to the solvent or total solution.

Conclusion - Summary of the research and the results of the experiment.

Conserved Regions - DNA sequences that share nucleotides

Contig (Contiguous) - A series of DNA sequences that overlap to make a physical model to reconstruct the original DNA sequence. This approach is used in Next Generation Sequencing.

Control - A predetermined consistency throughout an experiment

Controlled experiment - an experiment in which an experimental group is compared to a control group that varies only in the factor being tested.

Control Group - untreated subjects used as test benchmark.

Controlled Variables - factors in an experiment that a scientist purposely keeps the same.

Conjugate Acid - What results when a base accepts an H+ and now has a proton can be donated.

Conjugate Base - What results when an acid donates an H+, and becomes a base because it can not accept an H+.

Confidentiality - Keeping information secret in regard to patients, human test subjects, or company intellectual property.

Conjugate Acid/Base Pair - When two molecules easily transfer an H+ between them, as observed in some acid/base reactions.

Coomassie Blue - A biological stain which binds to the side chains of certain amino acids, shifting the color from brown to blue.

Copy Number Variant - The number of copies of a gene that varies from one individual to another

Cover Slip - Small square of glass or plastic used to cover a specimen on a microscope slide

Cross contamination - The presence of a small quantity of unwanted material or specimens that may adversely affect the sterility of a working sample

Cross-dimers - Forward primer binds with reverse primer and not the template strand.

Cryogenics - Cooling cells and tissues to sub zero temperatures. The colder the environment, the longer the cells can survive.

CGMP (Current Good Manufacturing Practices) - A system focused on the design and manufacture of resources such as drugs and chemicals.

Culture (noun) - Microorganisms that are cultivated in a lab for the purpose of studying them.

Culture (verb) - To maintain the conditions necessary for growth of an organism

Culture Slants - Slants are commonly used to generate stocks of bacteria

Culture Stabs - Similar to agar plates, but are made with solid agar in a test tube. These are commonly used for short-term storage of cell cultures.

Cuvette - the container that holds a sample for analysis in a spectrophotometer

D

Data/Observations - values written down as the experiment progresses; or sensory observations.

Ddideoxynucleodites (ddNTP) - Nucleotides whose structure inhibits DNA polymerase from building DNA.

Decolorizer - An alcohol that dehydrates the cell wall of bacteria to assist with removal of a stain

Denature - When a protein loses its secondary structure (shape or conformation), the primary structure is not affected

Denature Stage (PCR) - The first stage of PCR when higher temperature allow double stranded DNA to become single stranded

Deoxynucleotides (dNTP) - Are nucleotides that contain deoxyribose.

Deoxyribose - A 5 carbon sugar group in the nucleotide.

Dependent Variable - The factor of an experiment that is altered as a result of the independent variable.

Dideoxynucleotides (ddNTPs) - Inhibitors of DNA polymerase used in the Sanger Sequencing Method.

Differential Media - Media which reflects color change depending on microorganisms present.

Differential Staining - A specific type of biological process that often uses more than one type of reagent. It is used to distinguish one specimen from another; example: Gram Stain

Diffraction - A method of splitting up a beam of light into its individual components.

Diluent - The solvent used to dilute a solution

Dilution - The reduction of the concentration of a chemical or biological solution.

Dilution Factor - The final volume/solute volume

Dimensional Analysis - A problem-solving method that uses the fact that any number or expression can be multiplied by one without changing its value. Also called the Factor-Label-Method.

Direct ELISA - An ELISA designed to detect the presence of antigens in a solution (usually a sample from a patient)

Disclosure - The release, transfer,or access in any manner of information outside of an authorized individual or organization of a subject's documents, such as health records or research participation.

Dissociation - Breaking down of a molecule into its components.

DNA (Deoxyribose Nucleic Acid) - The main component of a chromosome; a double stranded nucleic acid consisting of an unique order of bases (A, T, G, C), which stores information that determines the characteristics of an organism

DNA Band - The segment of stained/visible nucleic acid in a gel after electrophoresis

DNA Barcoding - A method used to identify species using short sections of DNA from a specific gene or set of genes.

DNA Denaturation - The process of separating the double strands of DNA into two single strands.

DNA Fingerprinting - A laboratory technique that compares different DNA samples based on specific nucleotide sequences which are unique to individuals.

DNA Migration - The movement of a DNA away from the cathode (toward the anode) during electrophoresis

DNA Polymerase - The enzyme responsible for the addition of complementary bases during DNA Replication

DNA Polymerase I - A type of exonuclease which removes the RNA primers from the lagging stranded

DNA Polymerase III - Adds nucleotides to the strand but can only work in the 3' to 5' direction.

DNA Probe - Chemicals that are used to help identify specific fragments of DNA.

DNA Replication - The natural process of making a copy of DNA

DNA Sequencing - The process of determining the order of the nucleotides in DNA.

DNA Stain - Chemical solutions that bond directly to DNA to help visualize DNA bands in processes like gel electrophoresis.

DNA Subway - A bioinformatics workspace which allows the analysis of genetic sequences through tools such as phylogenetic trees and DNA barcodes.

DNA/Plasmid Prep - A method of isolating DNA or plasmids from bacteria by way of a column

dNTP - Free floating nucleotides used in DNA Replication and PCR

E

Uis E-Value - The expected number of hits to see by chance when searching a sequence database, the E-Value decreases exponentially as the Score (S) of the match increases

Electrolysis - The breaking down of chemicals by using an electrical current passing through a solution.

Electromagnetic spectrum - All of the different sizes of light waves of electromagnetic radiation.

Electropherogram - A technique that is used to determine a DNA sequence by graphing the concentration of nucleotides.

Electrophoresis Chamber - A container that transmits a controlled electric current through a solution in order to separate molecules located inside a gel

Electrophoresis - The use of electric current to separate molecules based on size and charge through a solid media, such as agarose or polyacrylamide

Eluate - A term used to describe the released mixture of protein and solvent.

Eluent - A term used to describe the solution used to release protein from matrix.

Elute - To remove a substance from a chromatography column by rinsing the column with a solvent

Elution - A term used to describe the process of extracting one material from another by washing with a solvent.

Emission - The release of energy by a body after it has absorbed energy (light).

Enzyme Linked Immunosorbent Assay (ELISA) - A technique that utilizes chemical specificity to detect and quantify a specific protein in a solution (usually a sample from a patient)

EPA (Environmental Protection Agency) - A government agency that focuses on human and environmental health

Equipment Log - A running record of all equipment in a laboratory setting, including maintenance history and functioning status.

Erlenmeyer Flasks - Glassware with a cone base shape and a narrow opening. Not as accurate at the graduated cylinders and volumetric flasks. These should not be used when accurate measurements are needed

Ethics - Moral or principles based on standards of right and wrong about human behavior, including rights, obligations, fairness and virtues.

Ethical - Something that is pertaining to morals or principles in conduct.

Eukaryote - A type of cell that has a true nucleus and membrane bound organelles. Can be a single organism or build complex multicellular organisms. Diameter range of 10 to 100 µm.

E-Value (Expect Value) - A value indicating the chance when using a database, such as through a BLAST, that the value is random. The lower the E-value, the more significant the match and the less likely it is chance.

Exon - A protein coding sequence of RNA, often in different sections, on a DNA template.

Experimental Group - The group of subjects that are exposed to the variable of a control experiment.

Experimental research - research that involves an experiment and the collection of data and/or observations; can be done in a laboratory or as field work (outside of a laboratory).

Explant Cultures - Pieces of tissue that have been placed directly onto a growth media.

Extension/Elongation Stage (PCR) - The third stage of PCR when mid-range temperature allow Taq polymerase to bond the complementary bases

Extract - The removal of a specific molecule from a solution or preparation

F

Fabrication - A type of research misconduct that involves recording or reporting made up data or results.

Falsification - A type of research misconduct that involves manipulating equipment, data, or procedures so that data is not reported accurately

FDA - Food and Drug Administration- responsible for protecting public health by regulating food safety, pharmaceuticals, and medical products.

Fermentation - The breakdown of substances for energy in the absence of oxygen. This is one of the ways organisms like yeast obtain energy.

Flask - Glassware with a narrow opening, usually conical shaped

FlyBase - A database for drosophila genetics and molecular biology

Forward Primer - A short DNA sequence that binds to DNA and builds a sequence from the 3’ end to the 5’ of a DNA template.

Fraction - A sample collected during chromatography elution

Fume Hood - A cabinet that uses negative airflow to draw fumes and vapors away from the user and limit exposure to hazardous and noxious fumes, vapors or airborne particulates.

G

Gel tray - The plastic container where a gel is molded

GenBank - A NIH genetic sequence database with all publicly available DNA sequences available for inquiry.

Gene - A unit of heredity made from sequences of DNA.

Gene Regulation - The use of proteins and nucleic acid to control the expression of genes, the location, and the timing.

Genetically Modified Organisms (GMO) - A plant, animal, or microorganism whose genetic material has been modified in a laboratory in favor of desired traits.

Genetic Mutation - A change in the DNA sequence of an organism.

Genome - The complete set of genes or genetic material for a cell or organism.

Genome.org - A peer-reviewed genome sciences journal

Genomic DNA- All the genetic information of an organism organized in chromosomes.

Globally Harmonized System (GHS) - An agency that defines the hazards associated with chemical by way of labels and safety data sheets

GLP (Good Laboratory Practices) - A set of guidelines to ensure quality and integrity in a laboratory

Glycerol Stock - A type of lipid mixed with liquid cultures to create frozen stocks for long term storage

Graduated Cylinder - Narrow cylindrical glassware used to accurately measure a volume in milliliters

Gram Negative - bacteria that appears red/pink after gram staining occurs because the primary stain is washed away due to minimal layers of peptidoglycan in the cell wall

Gram Positive - Bacteria that appears red/pink after gram staining occurs because the primary stain is washed away due to minimal layers of peptidoglycan in the cell wall

Gram Staining - A laboratory test that uses staining dyes to determine possible types of bacteria. The color difference is determined by the composition of the bacteria cell wall.

Gray Literature - Professional literature that has not been peer reviewed

Green Fluorescence Protein (GFP) - A protein that expresses gene fluorescence when exposed to UV light.

H

Halogenated-Solvents - These are organic solvents with halogens (Cl, F, Br, I, etc.).

Hairpins - A loop of genetic material that is created when the strands folds and binds with another section of the same strand.

Hayflick Limit - After a certain number of population doublings, cells stop dividing while generally retaining viability.

HCS - Hazardous Communication System

Heat Block - A piece of equipment containing an aluminum block that can be set to a specific temperature in order to heat a sample

Helicase - Breaks the hydrogen bonds of DNA, unwinds the double helix and forms a structure called the replication fork where the copies grow.

Henderson–Hasselbalch - Used to prepare buffer solutions and to estimate charges on ionizable species in solution, such as amino acid side chains in proteins

HeLa - Immortal cervical cancer cells from Henrietta Lacks

Heterogeneous - Solution composed of more than one phase.

HIPAA (Health Insurance Portability and Accountability Act) - A federal law that requires standards to protect sensitive patient information from being disclosed without the patient's consent.

Homogenous - Solution composed of only one phase.

Homologous - A gene sequence that has the same origin or function as another

Hot Hands - A silicone rubber cover used to protect hands when handling hot or cold items

Hot plate: Electronic device used to heat lab ware to set temperatures without a flame.

Hot Plate/Stirrer - An instrument that has separate operations to heat, stir, or do both simultaneously

Huntington's Disease - An inherited genetic disorder which leads to the progressive breakdown of nerve cells in the brain.

Hybridization - A single-stranded, complementary DNA probe pairs to the single-stranded fragment on the Southern blot.

Hydrogen Bond - A weak electrostatic bond. The strands are held together by a hydrogen atom of one molecule bonded to a hydrogen of another molecule.

Hydronium - A hydrogen ion bonded with a molecule of water, which is a positively charged ion.

Hydrophilic - The state of having a high affinity (attraction) for water molecules

Hydrophobic - The state of being repelled by water molecules

Hydrophobic Interaction Chromatography (HIC) - A method of separating molecules that uses hydrophobic (water repealing) properties.

Hydroxide - A molecule that contains one oxygen and one hydrogen bonded, which is a negatively charged ion.

Hypothesis - an educated guess to answer a scientific question; should be testable.

I

Illegal - The concept that something is not allowed by law.

Immunology - Scientific study of the structure and function of the immune system.

Incident Reporting - A tool to document an event that could cause injury to a person or damage to property.

Incubator - A device that can be set to a specific temperature in order to grow and maintain microbiological cultures or cell cultures.

Independent Variable - The factor of an experiment that is mindfully varied throughout an experiment

Indirect ELISA - An ELISA designed to detect the presence of antibodies in a solution (usually a sample from a patient)

Inducer - A molecule that binds to a repressor, removing it from the operator and allowing transcription.

Informed Consent - Human subjects that participate in research must have complete information about what it means to participate and give consent prior to the research.

Inoculate - Process used to add microorganisms to a sterile medium

Inorganic - Any substance in which two or more chemical elements generally other than carbon are combined

Insoluble - Unable to dissolve in a substance.

IACUC (Institutional Animal Care and Use Committee) - A committee of professionals that reviews proposed research where non-human vertebrates are used.

Insulin - A hormone produced by the pancreas which regulates the amount of glucose in the blood. A lack of insulin causes diabetes.

Intellectual Property - A product or idea that was created by someone where laws, such as patents, copyrights, or trademarks, protect others from using without permission.

Intro - The sequence of RNA produced from a DNA template that does not code for a protein.

Intron - A segment of a gene that is transcribed but not translated

Inversion - A chromosome mutation in which part of the chromosome breaks off and reattaches in reverse direction.

Ion - An atom that has gained or lost an electron and has an electrical charge.

Ion Exchange Chromatography - A method that allows the separation of ions and polar molecules based on their charge.

IRB - Institutional Review Board-a committee of professionals that reviews proposed research to ensure that it is ethically conducted.

J

K

L

Lac Operon - An operon found in E. coli and is involved in breaking down and transporting lactose, a type of sugar.

Lactobacillus acidophilus - A prokaryotic bacteria.

LacI - The gene that codes for the repressor protein for the Lac operon.

Ladder/Standard/Marker - A sample of DNA or protein with known sizes, used to create a standard curve in order to determine the unknown size of DNA or protein samples

Lagging Strand - DNA strand that forms in okazaki fragments due to the function of DNA polymerase III.

L*ambda* (ƛ) - the greek symbol used to represent the wavelength

Laminar Flow Hood - A cabinet in which air is drawn through a HEPA filter and blown in parallel (horizontal) flow toward the user in order to minimize sample contamination

L-arabinose operon - An operon in bacteria that produces three enzymes utilized for breaking down of the sugar L-arabinose.

Leading Strand - DNA strand that is continuously created.

Legal - The concept that something is allowed by law.

Legality - Obligations imposed by the law, which can incorporate moral or principle standards of right and wrong about human behavior.

Level - Adjusting the feet of a balance to ensure the base is on a horizontal plane which allows for the balance to accurately determine mass

Lewis acid - A molecule that can accept an electron pair.

Lewis Base - A molecule that can accept an electron pair.

Liability/Liable - Legal responsibility for actions and mistakes. Failure to meet responsibility can result in lawsuits.

Ligase - The enzyme that repairs nicks on the lagging strand during DNA Replication; linking the Okazaki fragments.

Linear regression - A straight line on a graph of data that helps to analyze actual and predicted data.

Line Graph - graphs that show the behavior of a variable, often over time

Liquid Nitrogen - Nitrogen in the liquid state utilized for long term storage in microbiology due to the low temperature

Literature Review - A secondary source that summarizes current knowledge on a topic

Literary research - the review of research or information that is found in a written form either in a journal, book, or online; a review of someone else's research or thoughts.

Litmus Paper - Changes to a variety of colors depending on the pH.

Loading Dye - A chemical solution that has glycerol and dyes, such as bromophenol blue, which makes the DNA sample more dense when pipetting into an agarose gel.

Logarithm - In math, it is an expression in which the power a number is can be raised. The parts of the expression include the base (b), the power it's raised to (n) and product of the expression (x).

Logarithmic scale - A scale that each increase of 1 on the scale indicates a 10x increase in concentration, the pH scale is logarithmic

Lot Control - The process of controlled input and output of product manufacturing, including tracking all materials used in the production process.

Lowry Assay - A protein identification technique that utilizes a protein-copper chelation which results in reduced copper producing a color change. The sample is analyzed using spectrophotometry with blue wavelengths of light.

λmax (lambda max) - The wavelength at which the maximum amount of light (energy) is absorbed by a solution

Lysis - The rupturing of the cell membrane.

M

Malpractice - Failure to meet a profession's standard of conduct, causing injury or damage to a patient or client. Failure may be caused by accidental or intentional wrongdoing.

M/V (Mass Volume) - A type of concentration where a specific amount (mass) is proportional to a volume. Ex: g/ mL, mg/ mL, or g/ L
Magnification - How much a microscope increases the image in proportion to the actual size

Master Mix - A solution of Taq polymerase, dNTPS, and all the reagents necessary for PCR

Materials - supplies or equipment.

Maxam-Gilbert Sequencing - Using chemical modification of DNA followed by cleave at bases complementary to modified nucleotides

Mean - A calculated average of a set of values

Measuring pipettes - these are commonly used to measure volumes between 1-25 ml.

Media - A solid or liquid growth substance used for microbial cultures

Media Bottles - Glass bottle with lid that is used to store media such a LB broth

Median - The value in a data set that represents the middle of the data, when organized in order.

MEGA (Molecular Evolutionary Genetics Analysis) - A tool for conducting automatic and manual sequence alignment, inferring phylogenetic trees, mining web-based databases, estimating rates of molecular evolution, and testing

Melting Temperature - Causes the primers to unbind from the template.

Messenger RNA (mRNA) - A type of single stranded RNA that is involved in the manufacturing of proteins in cells.

Micro - The prefix in the metric system that indicates 1 millionth of the standard unit

Micropipette - An instrument used to measure and deliver very small volumes; usually less than 1 mL

Microscope - device that produces magnified images of structures that are too small to see with the unaided eye.

Milli - The prefix in the metric system that indicates 1 thousandth of the standard unit

Minimal Media - Nutrient-poor media that contain minimal nutrients required for growth. Usually lacking amino acids and used for growing wild types of microorganisms.

Mitochondrial DNA (mtDNA) - A type of double stranded DNA that is found in the mitochondria of the cell. It is circular in shape and has different DNA than that of the nucleus.

Mixed Methods - Methods which utilize both quantitative and qualitative research approaches.

Mode - The value in a data set that is repeated most often in the set.

Model Organism - An animal, plant, or microbe used to study biological processes.

Molar Mass - The number of grams in 1 mole of a substance. Represent in g/mol.

Molality - moles of solute divided by kilograms of solvent.

Molarity - A type of concentration where the mass is expressed in moles per liter of volume (or a fraction of that unit)

Mole - A unit of measurement, which is having 6.023x1023 atoms of a substance.

Molecular Weight Ruler (MWR) - A DNA sample with known base sequence sizes used for comparison to unknown samples to determine band sizes.

Monochromator - An optical device that transmits specific wavelengths of light.

Mordant - A reagent that combines with a stain to fix (adhere) ; also known as a fixative

N

Nano - The prefix in the metric system that indicates 1 billionth of the standard unit

NCBI (National Center for Biotechnology Information) - A series of databases which are hosted by the United States for information relevant to biotechnology and biomedicine.

NCBI - The National Center for Biotechnology Information advances science and health by providing access to biomedical and genomic information

NCBI (National Center for Biotechnology Information) - an organization provides access to biomedical and genomic information

Negative Control - the group where no phenomenon is expected

Neutral - A solution with a pH 7, having an equal concentration of hydrogen and hydroxide ions

Neutralization Reaction - A type of chemical reaction when the H+ ions from an acid react with the OH- ions of a base, producing salt and water molecules.

Next Generation Sequencing - A method used to determine the portion of nucleotides in a given genome. This approach uses DNA sequencing

technology able to run multiple samples at the same time quickly and accurately.

NIH (National Institutes of Health) - A government agency that focuses on biomedical and public health research

Nitrogenous Base - Contains nitrogen, 5 different molecules are possible in DNA and RNA.

Non-Coding DNA - This DNA does not transcribe into RNA and translate into protein.

Normality - Is a multiple of molarity or a gram equivalent weight of a solute per liter of solution.

NSF - National Science Foundation-responsible for providing funding and education for the non-medical side of science and engineering.

Nucleic Acids - A type of macromolecule essential to all known forms of life. There are two classes of information coding molecules composed of nucleotide subunits: deoxyribonucleic (DNA) and ribonucleic acids (RNA).

Negligence - The failure to follow professional or ethical standards that can cause harm to a person.

Nucleotide - The basic structural unit of nucleic acids like DNA. The three parts of this unit include: A phosphate group, deoxyribose, and a nitrogenous base.

Nutrient agar - A media that can be used to grow a very wide range of microbes.

Nutrient Media - Contains all the elements required for a microorganism to grow, such as nitrogen, amino acids, carbon, and other nutrients. Used for general cultivation.

Null hypothesis - Represents a possible answer to a research question that shows there is no significance in the data observed from an experiment.

O

Objective - the lens of the microscope that produces the desired magnification of the specimen

Occupational Safety & Health Administration (OSHA) - An agency that defines proper safety regulations for the workplace

OD600 - Use of a spectrophotometer to on 600 nm to calculate the concentration of bacteria in a liquid culture

Okazaki Fragments - Sections of DNA formed on the lagging strand during DNA replication.

Operator - A section of DNA where a regulatory protein can bind, preventing transcription.

Operon - A unit of DNA that contains a cluster of genes responsible for protein synthesis.

Order of Operations - The rules of which calculation is done first in an expression.

Organic - Generally, any member of a large class of compounds whose molecules contain carbon.

Origin of Replication - In eukaryotes, DNA replication begins at many origins of replication. In prokaryotes, there is one origin of replication.

Orthologs - Genes in different species that evolved from a common ancestor. These genes, in general, retain the same function, and are vital in determining gene function in genomes.

OSHA (Occupational Safety & Health Administration) - An agency that defines proper safety regulations for the workplace

OSHA 10-Healthcare - A 10 hour course provided by various organizations that addresses an understanding of biological agents and workplace safety.

Overexpression - To make too many copies of a protein or other substance.

P

PAGE (Polyacrylamide Gel Electrophoresis) - A technique that utilizes a vertical electrophoresis chamber to separate proteins by charge and size while the protein is in the native state

Parts per Billion - One microgram (µg) per liter of water or kilogram of something.

Parts per Million - One milligram (mg) per liter of water or kilogram of something.

Pasteur pipettes - like an eye dropper. They are used to dispense liquid, but not to measure exact volumes.

Patient - A license that grants the rights to prevent others from making, using or selling an intellectual property.

PCR (Polymerase Chain Reaction) - A technique used to amplify a segment of DNA into millions of copies of the same DNA sequence

PC3 - common prostate cancer cell line

Peer Reviewed - A research article that has been put under the scrutiny of other experts of the same field before being published.

Peer-reviewed research - a research article that has been put under the scrutiny of other experts of the same field before being published.

Pellet - The liquid that collects at the bottom of a container as the result of centrifugation.

Peptide Bond - A covalent bond that links amino acids together to form a protein.

Peptone - A milk protein (casein) that has been pre-digested with an enzyme.

Percent by - The mass/volume of one substance divided by the total mass/volume of another in a solution.

Personal Protective Equipment (PPE) - safety equipment issued to help employees in protecting themselves from the hazards of their work environments. PPE includes fire retardant or chemical-proof clothing, gloves, hard hats, respirators, safety spectacles, etc.

pH - A measurement of the concentration of hydrogen ions in a solution or Power of Hydrogen.

Phylogeny - The study of relationships between organisms and their evolutionary history.

pH meter - A device to measure if a solution is acidic or basic using a voltmeter.

pH Paper - Changes colors depending on range of paper, some can be used for the full pH range (0-14), others for smaller ranges.

Phosphate Group - The “backbone” of DNA.

Pie/Circle Graph - A visual model of data comparing the percentage of categories on a like topic

Pipetor - An instrument that can be set to draw up a specific volume (in milliliters) of liquid when used in conjunction with a serological pipet

Plagiarism - A type of research misconduct that involves using someone else’s words, ideas, or results, without appropriately crediting their work

Plasmid - A circular DNA structure found inside the genome of microorganisms.

Plasmid DNA - A small, circular piece of double stranded DNA that is found in bacteria and other microscopic organisms.

Polymer - A chain of identical building blocks. In the case of DNA, nucleotides composed of deoxyribose, a phosphate group, and a nitrogenous base are the building block units.

Polymerase Chain Reaction (PCR) - A technique used to make millions of copies of a particular section of DNA.

Polymorphism - When a gene has more than one possible DNA sequence, leading to different possible combinations.

Polypeptides - A polymer (long chain) of amino acids, which forms proteins.

Post-stain - A stain a gel is soaked in after electrophoresis to allow visualization of bands (ex. Fast blast, coomassie blue, ethidium bromide)

Positive Control - the group where the phenomenon is expected

Power Source - The device used to manipulate the electric current from an outlet in order to maintain a specified voltage in the electrophoresis chamber

Precision - degree to which several measurements are within or near each other.

Pre-stain - Adding a stain to a sample or gel prior to electrophoresis (ex. syber green, ethidium bromide, EZ Vision) to allow visualization of samples

Preventative - Used to reduce the risk of an accident and avert exposure.

Primary Antibody - Used to detect a specific antigen of interest.

Primary Cells - Cells that are cultured directly from an organism. With the exception of some derived from tumors, most primary cell cultures have limited lifespans.

Primary Stain - The initial stain in a staining process

Primary Structure - A unique sequence of amino acids in a polypeptide.

Primase - The enzyme that generates a primer during DNA Replication

Primer - A section of single stranded DNA that is complementary to a specific sequence of DNA

Primer Dimers - A by product of PCR, where two fragments of DNA molecules have attached to each other, blocking the process of application.

Problem/Question - what the project or experiment is answering.

Procedures - a series of repeatable steps followed during the course of an experiment

Product Development - The series of steps including concept, design, development, marketing, and manufacturing of a product.

Product Life Cycle - The steps a product moves through in five stages: product development, market introduction, growth, maturity, and decline.

Prokaryote - A type of cell that does not have a true nucleus or membrane bound organelle. Most are single celled, though some live in colonies. Diameter range from 1 to 5 µm.

Promotor - A sequence of DNA where transcription by RNA polymerase begins.

Propagate - To culture or grow up a sample of an organism

Protein - A complex molecule that builds living things. Has many different shapes from combinations of different amino acids and joined by peptide bonds.

Protein Assay (general) - A laboratory technique to identify or quantify proteins in a sample

Protein Data Bank (PDB) - A database of three dimensional data of larger, biological molecules such as proteins and amino acids.

Protein Precipitation - A method in biotechnology to concentrate proteins and purify them from contaminants

Protein Solubilization - A method to break the interactions between molecules in a protein, including bonds and other interactions.

Protein Synthesis - The process by which amino acids are arranged into proteins using RNA and enzymes

Proton - A hydrogen ion, which is a positively charged ion.

Proteome - All of the proteins expressed by a genome

Pump - An instrument used draw up a liquid into a serological pipet

Pure Culture - a culture in which a single strain of bacteria is present

Purine - Consisting of two molecular rings. In DNA: Adenine (A) and Guanine (G).

Pyrimidine - Consisting of one molecular ring. In NDA: Cytosine (C) and Thymine (T). In RNA: Uracil (U).

Q

Quality Assurance - Maintaining the quality of a product by examining the manufacturing process over extended amounts of time

Quality Control - The operational techniques and the activities that sustain the quality of a product or service in order to satisfy given requirements. Quality control is a major component of total quality management and is applicable to all phases of the product life cycle: design, development, manufacturing, delivery and installation, and operation and maintenance.

Qualitative data - descriptive explanation of experimental results

Quality System – The entire set of documents, procedures and policies that define and explain a company's system for creating, maintaining and producing product using 'best practices'.

Quantitative data- numerical explanation of experimental results

Quantitative Methods - Methods which utilize numbers and measurable forms of data.

Quartneray Structure - The overall protein structure that results from two or more polypeptide units coming together.

R

Range - The difference between the lowest and highest values in a data set.

RCSB PDB (Protein Data Base) - Data base of the 3D shapes of proteins, nucleic acids, and complex molecules

Recombinant DNA - Novel DNA created by cutting and combining DNA from two or more sources

Recombinant Plasmid - A plasmid that has been modified with foreign genes.

Red Litmus Paper - Changes to blue in an alkaline (basic) solution.

Regulatory Department – Interacts with various governmental agencies to interpret and implement the relevant regulations. Interfaces with customers and patients to evaluate product performance.

Regulatory Proteins - A protein that influences the transcription function of RNA polymerase.

Relevance - Material having significant and applicable evidence to support or not support a particular idea or concept.

Reliability - To what extent an experiment, test, or measuring procedures produce the same results on repeated trials.

Repressor - Proteins that bind to an operator of DNA or RNA and turns off or reduces transcription.

Reproducibility – The ability to consistently reproduce a set of data within a range of expected values.

Resolution - The ability of a microscope to distinguish two separate points of a specimen in the image; affects image clarity

Responsive - Used when an incident has occurred to minimize damage and contain exposure

Restriction Digest - The procedure of cutting nucleic acids into segments using enzymes with known restriction sites

Restriction Enzyme - Molecules that cut at specific sequences of DNA. Each enzyme recognizes a unique sequence of DNA to cut.

Restriction Fragments - This is the DNA after it has been cut with restriction enzymes, the fragments created have different sizes depending on where the restriction site is located.

Restriction Fragment Length Polymorphism (RFLP) - The variations in the location of restriction sites lead to different sized fragments when cut with restriction enzymes.

Restriction/Recognition Site - A sequence in a nucleic acid that is recognized by a specific enzyme

Reverse Primer - A short DNA sequence that binds to DNA and builds a sequence from the 5' end to the 3' end of a DNA sequence.

R Group - Side chains for different elements on amino acids that give it its chemical properties.

Risk Management - A series of procedures and protocols within research as well as business to prevent accidents.

Ribose sugar - A type of 5 carbon sugar found in RNA.

Ribosomal RNA (rRNA) - A type of RNA that is non-coding and is the primary part of the ribosome, which is involved in the manufacturing of proteins.

Ribosome - A small structure inside the cell made of both RNA and protein and is the site of protein manufacturing in cells.

RNA Polymerase - An example that creates an RNA sequence from a DNA template during transcription.

RNA Primase - Joins RNA nucleotides to make the primers, starting point for DNA nucleotides to bind.

S

Safety Data Sheet (SDS) - A document that specifies information needed to use, store and dispose a chemical

SDS-PAGE - Short for sodium dodecyl sulfate polyacrylamide gel electrophoresis. This technique is used to separate proteins according to their size and charge.

Safety symbols - visual images that identify potential dangers; images/symbols generated and regulated by OSHA and GHS

Salt - One of the products from a neutralization reaction is a salt (it's not always NaCl).

Sample Buffer - A buffer used to prepare samples for analysis by changing the shape of proteins.

Sanger Sequencing - A DNA sequencing method that uses electrophoresis and inhibitors dideoxynucleotides and replication processes with DNA polymerase. These inhibitors bond with DNA easier than the typical DNA nucleotides. This prevents elongation of the DNA, creating smaller, incomplete, sections of DNA only used for strands 100-1000 bp, that make it easier to read.

Sanitation - application of measures designed to protect human health

Scatter/Line Graph - A visual model of the relationship of 2 or more variables

Scientific Notation - A simplification of a very large or very small number by identifying a basic whole number and the magnitude of 10, (ex: 0.0000000028 is written as 2.8 x 10^-9)

SRC (Scientific Review Committee) - A committee of professionals that reviews proposed research with a specific focus on vertebrate animals and hazardous biological agents.

SDS-PAGE - A technique that utilizes a vertical electrophoresis chamber to separate proteins by molecular while the protein is in a denatured state

Secondary Antibody - Use to detect the presence of the primary antibody.

Secondary Stain - The stain that follows the primary stain in a staining process

Secondary Structure - The folding and coiling of a polypeptide into a repeated configuration. Includes shapes such as an α helix and β pleated sheet.

Selective Media -Ingredients are present to encourage the growth of one or a few types of microorganisms.

Self-dimers - Primer binds with itself rather than the template strand.

Semi-log Graph Paper - A tool used to plot data of an exponential relationship in a linear model; one axis is linear, the other is logarithmic

Semiconservative - The process in DNA replication in which the double helix consists of one old strand and one newly made strand.

Semi-log Graph - A type of graph which has one axis on a linear scale while the other axis is on a logarithmic scale.

Sequence - The order of bases in a nucleic acid segment

Serial Dilution - A process of decreasing the concentration of a solution by using the same quantity each following step. This stepwise approach usually follows a logarithmic factor of 10.

Serological Pipet - A thin graduated tube of glass or plastic used to measure milliliter volumes of liquid

Shaking Incubator - A piece of equipment that can be set to a specific temperature and rotational speed in order to culture organisms in liquid media, usually bacteria

Shotgun Sequencing - Breaking long strands into random pieces then sequence using chain terminating ddnts and overlapping the duplicate sequences

Shelf-life - the length of time a biological or chemical may be properly stored before it is considered unstable for use

Significant figures - The number of figures to which there is some known degree of reliability.

SI units - A system of units that is organized in multiples of ten which are indicated by prefixes

Simple Stain - Use of only one stain to identify organisms or their defining structures.

SNP (Single Nucleotide Polymorphism) - A DNA sequence variation where one single nucleotide is altered.

SIP (Standard Industry Practice) - Regulated techniques and methods of an industry

Size Exclusion Chromatography - A method of separating molecules in a solution by their size through molecular weight using a resin substrate

Slant - A bacterial culture made by streaking bacteria onto solid growth medium poured in a glass tube and solidified at an angle

Slide - Rectangular piece of glass used to hold a microscope specimen

SNP (Single Nucleotide Polymorphism) - A difference of one nucleotide between homologous sequences

Sodium Hypochlorite - Bleach, a 10% bleach concentration is used to disinfect surfaces

Solute - The substance that is dissolved in the solution.

Solution - A solution is a homogeneous mixture of two or more substances (solvent and solute). A solution may exist in any phase (solid, liquid, or gas).

Solubility - The ability for a substance to be dissolved.

Soluble - Able to dissolve in a substance.

Solvent - The substance in a solution that does the dissolving. Water is the universal solvent but other solvent are commonly used in the lab.

SOP (Standard Operating Procedure) - A specified protocol (step by step procedures) that is utilized to carry out a process or technique

Southern Blot - A method to determine specific DNA sequences in a DNA sample using a filter membrane.

Specific Dilution - A direct dilution of a stock solution to a specific concentration.

Specific Immunity - Each antibody binds a particular and specific antigen.

Spectrophotometer - a laboratory instrument that measures that amount of light transmitted through a sample relative to wavelength

Spectrophotometry - a method of analyzing that involves how light interacts with the atoms (or molecules) in a sample of matter.

Splicing - The process of removing all the introns from an mRNA sequence and splicing the exons together for transcription.

Spoilage - To weaken the value or quality of

Stab - A bacterial culture made by piercing solid growth medium with an inoculating needle poured in a glass tube

Stakeholders - A person, organization, or business that has a particular interest in a situation

Standard - Policies that regulate how a company or organization must treat, pay, and protect their employees and interests.
Standard Curve - The use of a set of values derived from known properties to generate a calibration curve, which is then used to determine the same properties of an unknown sample

Standard deviation - The measure of how far each value is from the mean of a data set.

Standard Operating Procedure (SOP) - A specified protocol (step by step procedures) that is utilized to carry out a process or technique

Sterilize - A process in which all microorganisms and their parts are killed or destroyed on a surface or in medium or solution.

Sticky End - The result of a restriction digest using an enzyme that cuts a double stranded nucleic acid in different places on the complementary strands

Stir Bar - A plastic covered magnet placed into a solution on a hot plate stirrer to help mix the solution when the stir feature is turned on

Stir Plate - Automation used in conjunction with stir bar to mix solutions.

Stock Solution - A concentrated solution used to prepare diluted solutions of lower concentration for actual use.

Streak - Technique used in microbiology to place bacteria on solid media often in a specific pattern for isolating colonies

Streak Plating - A method of inoculating and isolating bacteria on a solid medium using an inoculating loop or other similar tool.

Supernatant - The upper layer, often liquid, that results during centrifugation.

T

Table Top Balance - A device that determines the mass of a substance in grams

Taq Polymerase - A type of DNA polymerase that can withstand high temperatures, known as thermostable and utilized for PCR.

Tare/Zero - Calibrating a balance to deduct the weight of the measurement container

Taxonomy - The science of classification, including organisms.

Technical bulletin - a publication that is used to explain how to approach a new or unique process which may occur in the lab setting.

TSA (Technical Skills Assessment): An assessment required by the state of Arizona at the completion of a CTE (career and technical education) program.

Telomere - A noncoding region of repeating DNA sequences at the end of a chromosome.

Tertiary Structure - The 3D shape of the polypeptide which results from the interactions between the amino acids and R groups.

Test Tubes- Narrow glass tube closed at one end

Thermal Cycler - A piece of equipment used for PCR that rapidly repeatedly cycles through specific temperatures to amplify DNA

Thermocycler - A piece of equipment that has been developed to cycle through temperature changes for PCR.

Thin Layer Chromatography (TLC) - A technique that separates analytes in a solvent mixture onto TLC paper via capillary action

Tip - a single use (disposable) plastic end added to a micropipette, used to avoid cross contamination

Titrations - The slow addition of one solution with a known concentration (such as pH) to a known volume of another solution with an unknown concentration (such as pH).

Total Score - The sum of alignment scores of all segments from the same examined sequence. The larger the value, the closer the matching sequence is from a BLAST to the searched sequence.

Tractable - An idea or concept that is able to be tested with all limitations considered (time, cost, equipment)

Tractable Question - easily managed or controlled.

Trademark - A license that grants specific intellectual property, such as names, logos, and packaging, protection from being used without permission.

Transcription - The process in which DNA is copied into a new molecule of messenger RNA (mRNA).

Transfer RNA (tRNA) - A type of RNA that is involved in the manufacturing of proteins in cells, by carrying the building blocks of proteins to the ribosomes.

Transformation - (most often bacterial transformation) A process used to incorporate new genes into an organism via plasmid uptake.

Transformation Efficiency - How successful the transformation process was with bacteria incorporating a plasmid.

Translation - The process in which the mRNA formed in transcription is decoded, in which the sequence of nucleotide codes for specific amino acids are used to build a protein.

Translocation - A chromosome mutation in which one piece of a chromosome breaks off and attaches on another chromosome.

Transmittance - A measurement of the amount of light that passes through a sample (unit is %)

Trend Analysis- Long term evaluation of data to identify trends

trp operon - An operon in bacteria which produces the amino acid tryptophan.

U

Unethical - Not conforming to morals or principles based on standards of right and wrong.

Unit of Measurement - A definite size of some physical quantity, defined and adopted by convention, that is used as a standard for measurement of the same physical quantity.

USDA - United States Department of Agriculture- responsible for protecting US agriculture from pests and disease.

UV Spectrophotometer - Measures the amount of light passing (transmitting) through a sample from 180-380nm, utilized to determine concentration

V

Validation Process - The ability to demonstrate that a manufactured product will meet expectations and required parameters.

Validity - The extent that the results of research actually measure what they are supposed to measure.

Variable - A factor in an experiment that is either purposely changed or altered as a result of another variable

Variable Regions - DNA sequences that have a wide range of nucleotides

Variable Number Tandem Repeats (VNTR) - Short sequences of repeating nucleotide sequences.

Variance – An event or result that is not part of the approved process, procedure and/or expected result.

Visible Spectrophotometer - Measures the amount of light passing (transmitting) through a sample from 380-750nm, utilized to determine concentration

Volumetric Flasks- calibrated with more accuracy than a graduated cylinder, but they only measure a single volume. They have a round base and narrow neck.

Vulnerable Population - A group of people in research who could be at risk to unethical treatment due to limited resources, inability to provide informed consent, or at risk of being manipulated.

W

Water Bath - A piece of equipment filled with water that can be set to a specific temperature used to heat a sample. It is used in the laboratory for incubations.

Wavelength - Distance between peaks or valleys in a light wave

Weigh Boat - A plastic bowl shaped container that holds a substance when being massed on a balance

Weigh Paper - A thin paper used to hold a substance when being massed on a balance

Wells - Small divots in a gel into which samples are aliquoted for electrophoresis

Western Blot - A technique utilized to identify proteins from a gel by transferring the proteins to a membrane and using antibody binding to detect a specific protein

White Paper - Information printed from a credible institute such as a government agency

Working Solution - The solution that is used during an experiment and is worked with.

X

Y

Yeast - A eukaryotic fungus.

Z

Zero/Tare - Setting the balance scale to zero.