

Course Glossary

This glossary is a list of terms introduced throughout PLTW Medical Interventions.

Term	Definition
algorithm	An algorithm is a step-by-step process that performs a computational task.
allele	Any of the alternative forms of a gene that may occur at a given locus.
allocation policies	Rules or policies, generally based on medical criteria, established by the OPTN to guide and regulate organ allocation or distribution in the United States.
amino acid	The subunit of a protein.
amniocentesis	A technique for determining genetic abnormalities in a fetus by the presence of certain chemicals or defective fetal cells in the amniotic fluid, obtained by aspiration from a needle inserted into the uterus.
ampicillin	A penicillin that is effective against Gram-negative and Gram-positive bacteria.
anesthesia	Loss of sensation and usually of consciousness without loss of vital functions artificially produced by the administration of one or more agents that block the passage of pain impulses along nerve pathways to the brain.
anneal	To be capable of combining with complementary nucleic acid by a process of heating and cooling.
antibiotic	A substance produced by or derived from a microorganism and able in dilute solution to inhibit or kill another microorganism.
antibiotic resistance	Resistance to one or more antibiotics, usually due to additional genetic information.
antibody	A protein secreted by plasma cells (differentiated B cells) that binds to a particular antigen and marks it for elimination.
antigen	A foreign macromolecule that does not belong to the host organism and elicits an immune response.
apoptosis	The changes that occur within a cell as it undergoes programmed cell death, which is brought about by signals that trigger the activation of a cascade of suicide proteins in the cell destined to die.
audiogram	A graphic representation of the relation of vibration frequency and the minimum sound intensity for hearing.

Term	Definition
bacterial transformation	The process by which the genetic makeup of the cell is changed by the uptake of DNA from the environment.
biofeedback	The technique of making unconscious or involuntary bodily processes (as heartbeat or brain waves) perceptible to the senses in order to manipulate them by conscious mental control.
bioinformaticians	Scientists involved in the field of bioinformatics.
bioinformatics	The collection, classification, storage, and analysis of biochemical and biological information using computers especially as applied in molecular genetics and genomics.
biopsy	The removal and examination of tissue, cells, or fluids from the living body.
bone scan	A test that detects areas of increased or decreased bone metabolism; test is performed to identify abnormal processes involving the bone such as tumor, infection, or fracture.
BRCA	Either of two tumor suppressor genes (BRCA1 and BRCA2) that in mutated form tend to be associated with an increased risk of certain cancers and especially breast and ovarian cancers.
cancer	A malignant tumor of potentially unlimited growth that expands locally and systemically.
carrier screening	Indiscriminate examination of members of a population to detect heterozygotes for serious disorders.
case-control study	A type of epidemiologic study where a group of individuals with the diseases, referred to as cases, are compared to individuals without the disease, referred to as controls.
cell cycle	An ordered sequence of events in the life of a eukaryotic cell, from its origin in the division of a parent cell until its own division into two.
central dogma of molecular biology	The two-step process, transcription and translation, by which the information in genes flows into proteins: DNA → RNA → protein.
chemotherapy	The use of chemical agents in the treatment or control of disease or mental disorder.
chorionic villus sampling (CVS)	A technique for diagnosing genetic and congenital defects in a fetus by removing and analyzing a sample of the fetal portion of the placenta.
chromatography	A process in which a chemical mixture carried by a liquid or gas is separated into components as a result of differential distribution of the solutes as they flow around or over a stationary liquid or solid phase.

Term	Definition
clinical trial	A scientifically controlled study of the safety and effectiveness of a therapeutic agent (as a drug or vaccine) using consenting human subjects.
cloning	Using a somatic or body cell from a multicellular organism to make one or more genetically identical individuals.
cochlear implant	An electrical prosthetic device that enables individuals with sensorineural hearing loss to recognize some sounds and that consists of an external microphone and speech processor that receive and convert sound waves into electrical signals which are transmitted to one or more electrodes implanted in the cochlea where they stimulate the auditory nerve.
cohort study	A type of epidemiologic study where a group of exposed individuals (individuals who have been exposed to the potential risk factor) and a group of non-exposed individuals are followed over time to determine the incidence of disease.
column chromatography	Chromatography in which the substances to be separated are introduced onto the top of a column packed with an adsorbent (as silica gel or alumina), pass through the column at different rates that depend on the affinity of each substance for the adsorbent and for the solvent or solvent mixture, and are usually collected in solution as they pass from the column at different times.
computed tomography scan (CT or CAT Scan)	A sectional 3-dimensional view of the body constructed by computed tomography.
concentration	The amount of a specified substance in a unit amount of another substance.
conductive hearing loss	Hearing loss or impairment resulting from interference with the transmission of sound waves to the cochlea.
conjugation	The one-way transfer of DNA between bacteria in cellular contact.
controlled study	Clinical trial in which the subjects are distributed into groups which are either subjected to the experimental procedure (as use of a drug) or which serve as controls.
crossmatch	The testing of the compatibility of the bloods or tissues of a donor and a recipient by mixing the blood or tissue of the other to determine the absence of agglutination reactions.
cryosurgery	Surgery in which diseased or abnormal tissue (as a tumor or wart) is destroyed or removed by freezing (as by the use of liquid nitrogen).
denaturation	In DNA, the separation of the two strands of the double helix.

Term	Definition
diagnostic Imaging	Technologies that doctors use to look inside your body for clues about a medical condition; includes X-rays, CT scans, nuclear medicine scans, MRI scans and ultrasound.
dialysis	Medical procedure to remove wastes or toxins from the blood and adjust fluid and electrolyte imbalances by utilizing rates at which substances diffuse through a semipermeable membrane.
DNA ligase	A linking enzyme essential for DNA replication and recombinant DNA techniques.
DNA microarray	A microarray of immobilized single-stranded DNA fragments of known nucleotide sequence that is used especially in the identification and sequencing of DNA samples and in the analysis of gene expression (as in a cell or tissue).
double blind study	An experimental procedure in which neither the subjects nor the experimenters know which subjects are in the test and control groups during the actual course of the experiments.
enzyme-linked immunosorbant assay (ELISA)	A quantitative in vitro test for an antibody or antigen in which the test material is absorbed on a surface and exposed either to a complex of an enzyme linked to an antibody specific for the antigen or an enzyme linked to an anti-immunoglobulin specific for the antibody followed by reaction of the enzyme with a substrate to yield a colored product corresponding to the concentration of the test material.
elute	Remove by washing with a solvent.
end stage renal disease	The final stage of kidney failure (as that resulting from diabetes, chronic hypertension, or glomerulonephritis) that is marked by the complete or nearly complete irreversible loss of renal function.
enzyme	A protein serving as a catalyst; a chemical agent that changes the rate of reaction without being consumed by the reaction.
epidemic	Affecting an atypically large number of individuals within a population, community, or region at the same time.
epidemiology	A branch of medical science that deals with the incidence, distribution, and control of disease in a population.
familial cancer	Cancer that occurs in families more often than would be expected by chance. These cancers often occur at an early age, and may indicate the presence of a gene mutation that increases the risk of cancer. They may also be a sign of shared environmental or lifestyle factors.

Term	Definition
Food and Drug Administration (FDA)	"The Food and Drug Administration is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of our nation's food supply, cosmetics, and products that emit radiation."
gel electrophoresis	The separation of nucleic acids or proteins, on the basis of their size and electrical charge, by measuring their rate of movement through an electric field in a gel.
gene	A discrete unit of hereditary information consisting of a specific nucleotide sequence of DNA.
gene therapy	The alteration of the genes of a person afflicted with a genetic disease.
genetic counseling	A process of communication that deals with the occurrence or risk that a genetic disorder will occur in a family.
genetic engineering	The direct manipulation of genes for practical purposes.
genetic marker	Alteration in DNA that may indicate an increased risk of developing a specific disease or disorder.
genetic testing	The use of methods to determine if someone has a genetic disorder, will develop one, or is a carrier.
genome	The complement of an organism's genes; an organism's genetic material.
genotype	The genetic makeup of an organism.
haplotype	A group of alleles of different genes on a single chromosome that are closely enough linked to be inherited usually as a unit.
hearing aid	An electronic device usually worn by a person for amplifying sound before it reaches the receptor organs.
hemodialysis	The process of removing blood from an artery (as of a kidney patient), purifying it by dialysis, adding vital substances, and returning it to a vein.
herd immunity	The resistance of a group to an attack by a disease to which a large proportion of the members of the group are immune.
hereditary cancer	An inherited disorder in which affected individuals have a higher-than-normal chance of developing certain types of cancer, often before the age of 50.
histocompatibility	A state of mutual tolerance between tissues that allows them to be grafted effectively.

Term	Definition
human leukocyte antigen (HLA)	Molecules found on all nucleated cells in the body that help the immune system to recognize whether or not a cell is foreign to the body. These antigens are inherited from one's parents. Human leukocyte antigens are used to determine the compatibility of kidneys and pancreases for transplantation from one individual to another. The major groups of HLA antigens are HLA-A, HLA-B, and HLA-DR.
hydrophilic	Having an affinity for water.
hydrophobic	Having an aversion to water.
in vitro	Performed in the lab, outside of a living organism.
in vitro fertilization	A procedure in which gametes are fertilized in a dish in the laboratory, and the resulting zygote is implanted in the uterus for development.
in vivo	Taking place inside a living organism.
inner ear	The essential part of the vertebrate organ of hearing and equilibrium that includes the vestibule, the semicircular canals, and the cochlea.
inoculation	The introduction of a pathogen or antigen into a living organism to stimulate the production of antibodies.
insulin	A protein hormone synthesized in the pancreas that regulates blood sugar levels by facilitating the uptake of glucose into tissues.
iterative	A process that repeats a series of steps over and over until the desired outcome is obtained.
job shadowing	An opportunity to follow a professional throughout their day to learn more about the daily tasks and responsibilities of their role.
karyotype	A display of the chromosome pairs of a cell arranged by size and shape.
kidney transplant	To transfer a kidney from one individual to another.
laparoscope	A fiber optic camera that is inserted through an incision in the abdominal wall and is used to examine visually the interior of the peritoneal cavity.
laparoscopy	A minimally invasive surgery involving visual examination of the inside of the abdomen by means of a laparoscope.
magnetic resonance imaging (MRI)	A noninvasive diagnostic technique that produces computerized images of internal body tissues and is based on nuclear magnetic resonance of atoms within the body induced by the application of radio waves.

Term	Definition
major histocompatibility complex (MHC)	A family of genes that encode a large set of cell surface proteins called MHC molecules. Class I and class II MHC molecules function in antigen presentation to T cells. Foreign MHC molecules on transplanted tissue can trigger T cell responses that may lead to rejection of the transplant.
marker analysis	A genetic technique whereby the sequence of the gene is not directly analyzed, but the mutant copy (allele) of the gene is inferred through analysis of a genetic marker.
medical intervention	Any measure whose purpose is to improve health or alter the course of disease.
melanoma	A tumor of high malignancy that starts in melanocytes of normal skin or moles and metastasizes rapidly and widely.
metacognition	Metacognition is the mental process that learners use to understand and monitor their learning.
metastasis	The spread of a disease-producing agency (such as cancer cells or bacteria) from the initial or primary site of disease to another part of the body.
microsatellite (also known as short tandem repeats-STRs)	Any of numerous short segments of DNA that are distributed throughout the genome, that consist of repeated sequences of usually two to five nucleotides, and that are often useful markers in studies of genetic linkage because they tend to vary from one individual to another.
middle ear	The intermediate portion of the ear containing a chain of three ossicles that extends from the tympanic membrane to the oval window and transmits vibrations to the inner ear.
model system	An organism chosen to study broad biological principles.
myoelectric	Utilizing electricity generated by muscle.
nanomedicine	Area of biomedical research that seeks to use tools from the field of nanotechnology to improve health.
National Organ Transplant Act (NOTA)	The National Organ Transplant Act (1984 Public Law 98-507), approved October 19, 1984 and amended in 1988 and 1990, provided for the establishment of the Task Force on Organ Transplantation; authorized the Secretary of HHS to make grants for the planning, establishment, and initial operation of qualified OPOs; and established the formation of the Organ Procurement and Transplantation Network (OPTN) and Scientific Registry of Transplant Recipients (SRTR).
nephrectomy	The surgical removal of a kidney.

Term	Definition
newborn screening	The analysis of a neonate's blood for metabolic or genetic disorders to prevent mental retardation, disability or death.
nucleoid	The DNA-containing area of a bacterial cell.
occupational therapy	Therapy based on engagement in meaningful activities of daily life (as self-care skills, education, work, or social interaction) especially to enable or encourage participation in such activities despite impairments or limitations in physical or mental functioning.
oncogene	A gene having the potential to cause a normal cell to become cancerous.
oncolytic	A virus that preferentially infects tumor cells and lyses them.
open study	Clinical trial in which both the researchers and the patients know who receives the drug and who receives a placebo.
Organ Procurement and Transplantation Network (OPTN)	The OPTN operates the national network for organ procurement and allocation and works to promote organ donation. Through its policies, the OPTN works to ensure that all patients have a fair chance at receiving the organ they need, regardless of age, sex, race, lifestyle, religion, or financial or social status.
organ procurement organization	Facilitate the organ donation process by assessing in-hospital deaths for donor eligibility; consulting with families of potential donors; and retrieving, preserving, and transporting organs for transplantation.
osteosarcoma	A cancer derived from bone or containing bone tissue.
outbreak	A sudden rise in the incidence of a disease.
outer ear	The outer visible portion of the ear that collects and directs sound waves toward the tympanic membrane by way of a canal which extends inward through the temporal bone.
panel reactive antibody (PRA)	The percent PRA value is a measure of a patient's level of sensitization to donor antigens. It is the percentage of cells from a panel of blood donors against which a potential recipient's serum reacts. The PRA reflects the percentage of the general population that a potential recipient makes antibodies (is sensitized) against. The higher the PRA, the more sensitized a patient is to the general donor pool, and thus the more difficult it is to find a suitable donor. A patient may become sensitized as a result of pregnancy, a blood transfusion, or a previous transplant.
pathogen	A specific causative agent of disease.
peritoneal dialysis	A procedure performed in the peritoneal cavity in which the peritoneum acts as the semipermeable membrane.

Term	Definition
pharmacogenetics	The study of the interrelation of hereditary constitution and response to drugs.
phenotype	The physical and physiological traits of an organism.
physical therapy	The treatment of disease by physical and mechanical means (as massage, regulated exercise, water, light, heat, and electricity).
placebo	An inert or innocuous substance used especially in controlled experiments testing the efficacy of another substance (as a drug).
plasmid	A small ring of DNA that carries accessory genes separate from those of the bacterial chromosome.
polyacrylamide	A polymer used as a gel material in vertical electrophoresis; used to separate smaller molecules, like proteins or very small pieces of DNA or RNA.
polymerase chain reaction (PCR)	A technique that involves copying short pieces of DNA and then making millions of copies in a short period of time.
preimplantation genetic testing (PGT)	In assisted reproductive technology, the determination of genetic abnormalities in the embryo before it is transferred to the uterus.
primer	A short piece of DNA or RNA that is complementary to a section of template strand and acts as an attachment and starting point for the synthesis strand during DNA replication.
prosthesis	An artificial device to replace or augment a missing or impaired part of the body.
prosthetist	A professional who makes and fits prostheses, artificial devices designed to replace or augment a missing or impaired part of the body.
proto-oncogene	A normal cellular gene corresponding to an oncogene; a gene with a potential to cause cancer but that requires some alteration to become an oncogene.
radiation therapy	The treatment of disease by means of radiation (as X-rays).
radiology	A branch of medicine concerned with the use of radiant energy (as X-rays or ultrasound) in the diagnosis and treatment of disease.
recombinant DNA	A DNA molecule made in vitro with segments from different sources.
recruiters	Liaisons for an organization to find people that would be a good fit and encourage them to join.
restriction enzyme	A degradative enzyme that recognizes specific nucleotide sequences and cuts up DNA.

Term	Definition
resume	A compiled list that provides a snapshot of your education and work experience.
risk factor	Something which increases risk or susceptibility.
screening	To test or examine for the presence of something (as a disease).
sensorineural hearing loss	Hearing loss or impairment resulting from problems with the auditory nerves.
serial dilution	A stepwise dilution of a substance in solution.
sex selection	Methods used to predetermine or diagnose the sex of an embryo for the purpose of selecting only those embryos of a particular sex for transplanting to the uterus of a woman.
single blind study	An experimental procedure in which the experimenters but not the subjects know the makeup of the test and control groups during the actual course of the experiments.
single nucleotide polymorphism (SNP)	One base-pair variation in the genome sequence.
solute	A substance dissolved in another substance.
solution	A homogeneous mixture of two or more substances, which may be solids, liquids, gases, or a combination of these.
solvent	A substance, usually a liquid, capable of dissolving another substance.
sound	Mechanical energy that is transmitted by longitudinal pressure waves in a medium (such as water or air).
sporadic cancer	Cancer occurring occasionally, singly, or in scattered instances.
stakeholders	An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project.
substrate	The reactant on which an enzyme works.
supernatant	The (usually) clear liquid left behind after a precipitate has been spun down to the bottom of a vessel by centrifugation.
suture	The act or process of sewing parts of the living body with sutures.
taq polymerase	A DNA synthesis enzyme that can withstand the high temperatures of PCR.
thermal cycler	An instrument that automatically cycles through different temperatures used to complete PCR reactions.

Term	Definition
tissue engineering	A multidisciplinary field involving biology, medicine, and engineering working to restore, maintain, and enhance tissue and organ function.
tissue typing (also known as HLA Typing)	The determination of the degree of compatibility of tissues or organs from different individuals based on the similarity of histocompatibility antigens especially on lymphocytes and used especially as a measure of potential rejection in an organ transplant procedure.
transduction	The transfer of genetic material from one organism (such as a bacterium) to another by a genetic vector.
transformation	The uptake and expression of foreign DNA by a cell.
transformation efficiency	A measure of how well cells are transformed to a new phenotype.
trocar	A sharp-pointed surgical instrument fitted with a small tube for insertion into a body cavity.
tumor suppressor gene	A gene whose protein products inhibit cell division, thereby preventing uncontrolled cell growth (cancer).
ultrasonography	A noninvasive technique involving the formation of a two-dimensional image used for the examination and measurement of internal body structures and the detection of bodily abnormalities.
vaccination	A procedure that presents the immune system with a harmless variant of a pathogen, thereby stimulating the immune system to mount a long-term defense against the pathogen.
vaccine	A harmless variant of a pathogen that stimulates a host's immune system to mount defenses against the pathogen.
vector	An agent (as a plasmid or virus) that contains or carries modified genetic material and can be used to introduce extra genes into the genome of an organism.
virologist	A specialist in virology, the branch of science that deals with viruses.
X-ray	To examine, treat, or photograph with X-rays.
xenotransplantation	A transplantation of an organ, tissue, or cells between two different species.