

ANNEX B: Selected Biotechnology Terms

Antigen – a chemical, protein, or microorganism that is recognized by, and attaches to an antibody (usually uniquely to a specific antibody)

Antibiotic – any of a variety of substances, usually obtained from microorganisms, that inhibit the growth of or destroy certain other microorganisms. Effective in the treatment and prevention of bacterial and rickettsial diseases. Ineffective against viral diseases. Examples include tetracycline, ciproflaxin, and erythromycin, among many others.

Antibody – an immunoglobulin that specifically recognizes and binds to an antigenic determinant on an antigen. Antibodies destroy or weaken bacteria and neutralize organic poisons, thus forming the basis of immunity.

Bioregulators – chemicals or enzymes that control physiological functions, such as pain, sleep, or mood.

Cloning – the process of preparing a largely identical group of organisms, cells, viruses, or nucleic acid molecules (including genes or gene fragments) descending from a single common ancestor

***Escherichia coli* (*E. coli*)** – a common type of bacteria found in the human intestine and aids in digestion. Many strains of the *E. coli* bacteria in gene splicing.

Gene Amplification – the creation of extra, functional copies of genes in a cell or organism.

Gene Expression – the combination of decoding the genetic information and synthesis of the gene product. Gene expression proceeds by two major steps—transcription and translation. *Transcription* is the synthesis of different types of RNA molecules (particularly messenger RNA, mRNA) according to the specific information of the gene transcribed. *Translation* is the synthesis of polypeptides using mRNA as a template which is encoded by polypeptide encoding genes.

Gene Mapping – locating the positions of the genes on the chromosomes of a particular organism

Gene Splicing – see polymerase chain reaction

Genome – the section of DNA that carries the complete set of genetic information for a virus, cell, or organism.

Monoclonal Antibodies – one of a group of identical antibodies able to react with on and the same antigen. Produced by a clone of engineered antibody-producing (“hybridoma”) cells obtained by fusion of immortal tumor cells with stimulated lymphocytes.

Mutagen – an agent that increases the rate of mutation by causing changes in the nucleotide sequences of DNA (for example, carcinogens)

Physiologically Active Compounds (PACs) – (see also bioregulators.) Endogenous mammalian compounds such as hormones, neurotransmitters, and neuropeptides. Examples include adenosine triphosphate (ATP), corticotropin releasing factor, dynorphin, enkephalin, glutamate, morphine modulatory peptide, N-acetyl-aspartyl-glutamate, nitric oxide, norepinephrine, serotonin, substance P, tumor necrosis factor, vasoactive intestinal peptide.

Polymerase Chain Reaction (PCR) – a method for the selective amplification of a DNA bas sequence using heat-stable polymerase and two 20-base primers. Because the newly synthesized DNA strands can serve as templates for the same primer sequences successive rounds of primer annealing, strand elongation, and dissociation produce rapid and highly specific amplification of the desired sequence. PCR can also be used to detect the existence of the defined sequence in the DNA sample.

Recombinant DNA – a DNA molecule made up of sequences that are not normally joined together, created by the process of cleaving an rejoining different DNA strands.

Transcription (T_C) – see Gene Expression

Translation (T_L) – see Gene Expression

Vaccine – a preparation of dead or attenuated pathogens, or of derived antigenic determinants, that is used to induce formation of antibodies or immunity against the pathogen. May be effective against specific viruses, bacteria, rickettsia, etc.

Vectors – Also, expression vectors. A vehicle for moving DNA from one cell to another, such as a plasmid into which foreign DNA can easily be inserted and which will be efficiently taken up by the host cell. Can act as a carrier molecule for the construction of recombinant DNA.