

# Appendix C.—Glossary of Acronyms and Terms

## Glossary of Acronyms

AID	—U.S. Agency for International Development	IgG	—immunoglobulin G
AIDS	—acquired immunodeficiency syndrome	IgM	—immunoglobulin M
BCG	—Bacillus Calmette-Guerin (vaccine)	IHA	—indirect hemagglutination assay
BOSTID	—Board on Science and Technology for International Development (NAS)	ILRAD	—International Laboratory for Research on Animal Diseases
BTI	— <i>Bacillus thuringiensis israeliensis</i>	IMMAL	—Scientific Working Group on the Immunology of Malaria (TDR)
CATT	—Card agglutination test for trypanosomiasis	IND	—investigational new drug
CDC	—Centers for Disease Control (DHHS)	INH	—isoniazid
CDD	—Program for Control of Diarrheal Diseases (WHO)	IOM	—Institute of Medicine (NAS)
cDNA	—complementary DNA	IPM	—integrated pest management
CF	—complement fixation (test)	LA	—latex agglutination (test)
CIE	—counterimmunoelectrophoresis	LRTI	—lower respiratory tract infection
COA	—coagglutination (test)	MABs	—monoclonal antibodies
COPT	—circumoval precipitin test	mRNA	—messenger RNA
CRL	—Cholera Research Laboratory (Pakistan)	NAMRU	—U.S. Naval Medical Research Unit
DDT	—dichloro-diphenyl-trichloro-ethane	NAS	—National Academy of Sciences
DEC	—diethylcarbamazine	NIAID	—National Institute of Allergy and Infectious Diseases (NIH)
DHF	—dengue hemorrhagic fever	NIH	—National Institutes of Health (DHHS)
DHHS	—U.S. Department of Health and Human Services	NRC	—National Research Council
DNA	—deoxyribonucleic acid	NYU	—New York University
DOD	—U.S. Department of Defense	ORT	—oral dehydration therapy
DPT	—diphtheria/pertussis/tetanus (vaccine)	PAHO	—Pan American Health Organization
ELISA	—enzyme-linked immunosorbent assay	PAS	—para-aminosalicylic acid
EPI	—Expanded Program on Immunization (WHO)	PMA	—Pharmaceutical Manufacturers Association
FCA	—Freund's complete adjuvant	PPD	—purified protein derivative
FDA	—Food and Drug Administration (DHHS)	P/s	—pyrimethamine/sulfadoxine
FIC	—Fogarty International Center for Advanced Study in the Health Sciences (NIH)	PSTC	—Program in Science and Technology Cooperation (AID)
GMI	—Gorgas Memorial Institute of Tropical and Preventive Medicine	RIA	—radioimmunoassay
GML	—Gorgas Memorial Laboratory	RNA	—ribonucleic acid
GND	—Great Neglected Diseases of Mankind (program) (Rockefeller Foundation)	RPHA	—reverse passive hemagglutination (test)
HI	—hemagglutination inhibition (test)	RSV	—respiratory syncytial virus
ICDDR/B	—International Center for Diarrheal Disease Research, Bangladesh	RVF	—Rift Valley fever
ICMRT	—International Center for Medical Research (Calcutta)	TDR	—Special Program for Research and Training in Tropical Diseases (U.N. Development Program/World Bank/World Health Organization)
IFA	—indirect fluorescent antibody (test)	T/S	—trimethoprim/sulfamethoxazole
		UNDP	—U.N. Development Program
		UNICEF	—U.N. International Children's Emergency Fund
		URTI	—upper respiratory tract infection
		VSG	—variant surface glycoprotein
		WHO	—World Health Organization
		WRAIR	—Walter Reed Army Institute of Research

## Glossary of Terms

**Acquired immunity:** Disease resistance in a person or animal acquired after birth. Such immunity may be active or passive.

**Acquired immunodeficiency syndrome:** See **AIDS**.

**Active immunity:** Disease resistance in a person or animal due to antibody production or other responses of the immune system after exposure to a disease-causing agent or a vaccine. (Compare *passive immunity*.)

**Acute:** Having a sudden onset, sharp rise, and short course. (Compare *chronic*.)

**Acute respiratory infections (ARIs):** A group of infections of the respiratory tract caused by viruses, bacteria, or mycoplasma, or very rarely, by fungi, protozoa, and the secondary effects of worms. Examples are pertussis, influenza, diphtheria, and measles. For clinical purposes, ARIs are divided between the upper and lower respiratory tracts. Upper respiratory tract infections occur around the teeth, gums, sinuses, throat, tonsils, epiglottis, middle ear, larynx, and trachea. Lower respiratory tract infections, in the lungs and bronchi, include various types of pneumonia and bronchitis.

**Adenovirus:** One of a group of viruses that causes upper respiratory disease and pneumonia.

**Adjuvant:** A substance added to the main ingredient of a prescription or solution to increase its effectiveness.

**Aerosolized vaccine:** A vaccine administered through the nose and mouth by inhaling a vapor, rather than through injection or ingestion.

**African sleeping sickness:** Infection by *Trypanosoma brucei gambiense* (chronic form found in west Africa) or by *T. b. rhodesiense* (acute form found in east Africa). Also called “African trypanosomiasis.” (See also *trypanosomiasis*.)

**African trypanosomiasis:** See *African sleeping sickness*.

**Agglutination:** The process by which cells or particles adhere and form visible clumps, a process which is exploited in many diagnostic tests.

**AIDS (acquired immunodeficiency syndrome):** A disorder characterized by an acquired (not inherited) deficiency of the immune system probably caused by a retrovirus known as HTLV-111, which is complicated by a rare type of cancer (Kaposi’s sarcoma) or infections caused by micro-organisms that usually do not produce infections in healthy individuals.

**Amebiasis:** Infection of the colon with amebae.

**American trypanosomiasis:** See *Chagas’ disease*.

**Animal reservoir:** See *reservoir, host*.

**Antibiotic:** A chemical substance produced by a micro-organism that is administered to fight infections, usually bacterial infections, in humans or animals. Examples are penicillin, tetracycline, and erythromycin.

**Antibody:** A serum protein (immunoglobulin) molecule produced by white blood cells in response to exposure to a specific antigen, and characterized by specific reactivity with that antigen. At present, five classes of antibodies are distinguishable. Most of the antibodies that circulate in the blood are immunoglobulin G (IgG); the others are IgM, IgA, IgD, and IgE. Antibodies are responsible for “humoral immunity.”

**Antigen:** A substance, usually a protein or complex carbohydrate, which, when introduced into the body of a human or other animal, stimulates the production of an antibody that reacts specifically with it.

**Antigen probe:** A sequence of DNA that is used to detect the presence of a particular nucleotide base sequence.

**Antimalarial:** A drug, such as chloroquine, that prevents or suppresses malaria infection.

**Antiserum:** Blood serum containing antibodies to a specific antigen.

**Arboviral infections:** A group of infections caused by arboviruses. Important human arboviral infections include yellow fever, dengue fever, oropouche fever, chikungunya, Japanese encephalitis, other viral encephalitides, and hemorrhagic fevers.

**Arbovirus:** One of a large number of viruses transmitted by or thought to be transmitted by arthropods (mosquitoes, ticks, etc.). The arboviruses do not comprise a natural taxonomic category of related organisms, but are grouped together because of their mode of transmission. Among them, however, are several groups of viruses that are closely related.

**Arenavirus:** One of a group of viruses traditionally grouped with the arboviruses, probably incorrectly. Arenaviruses probably are not transmitted by arthropods, though their life cycles still are not fully known.

**Arthropod:** An invertebrate animal belonging to the phylum Arthropoda, which includes insects, ticks, spiders, and crustaceans.

**Attenuated vaccine:** A vaccine made of whole pathogenic organisms that are treated with chemicals, radioactivity, or other means to render them incapable of producing infection.

**Autoantibody:** An antibody that is formed by an individual against the individual’s own tissues.

**Autoimmunity:** An immune state in which antibodies are produced by an individual against his or her own tissue (autoantibodies).

**Avirulent; nonvirulent:** Capable of causing only a mild or inapparent infection.

**Bacillus (pi., bacilli):** Any of various rod-shaped, aerobic bacteria belonging to the genus *Bacillus*.

**Bacillus Calmette-Guerin (BCG) vaccine:** A vaccine prepared from attenuated *Mycobacterium bovis*, an agent that infects cattle, and used to immunize humans against infection with *M. tuberculosis*, the related bacterium that causes human tuberculosis.

**Bacteremia:** A pathologic state characterized by the presence of bacteria in the blood.

**Bactericide:** An agent capable of killing bacteria.

**Bacteriology:** The scientific study of bacteria.

**Bacteriophage:** One of a group of viruses that infects and replicates in certain bacteria. Also called "phage."

**Bacteriostatic:** Capable of slowing or halting the growth of bacteria without killing them.

**Bacterium (pl., bacteria):** Any of a group of one-celled micro-organisms having round, rodlike, spiral, or filamentous bodies that are enclosed by a cell wall or membrane and lack fully differentiated nuclei. Bacteria may exist as free-living organisms in soil, water, organic matter, or as parasites in the bodies of plants and animals. Some, but not all, bacteria can cause disease.

**Base pairs (of nucleic acids):** Nucleotide bases that pair across the double helix of the DNA or RNA molecule in a very specific way: adenine with thymine (or uracil in RNA), cytosine with guanine.

**Biological control:** The control of insects or other organisms necessary for the development or transmission of disease, through measures such as the introduction of natural predators or pathogens of the target organism, the use of naturally produced chemicals, and the introduction of sterile insects to the breeding population. (Compare *environmental control*.)

**Bionomics:** The study of the relationship of organisms to the environment.

**Biotechnology:** Techniques that use living organisms or substances from such organisms to make or modify a product. In this report, biotechnology refers to recombinant DNA techniques and other sophisticated tools relying on the ability to harness and manipulate genetic material.

**B-lymphocytes:** See lymphocytes.

**Carrier:** A person or animal who, without apparent symptoms, harbors a pathogen and may serve as a source of infection to others.

**Case fatality rate:** The proportion of individuals with a specific diagnosis who die from the disease during a specified period of time.

**Cell culture:** Growth in the laboratory of cells isolated from multicellular organisms. Each culture is usually of one type.

**Cell-mediated immunity:** Immunity resulting from increase of activity by living cells in the blood and other tissues (e.g., T-lymphocytes, natural killer cells) that directly and nonspecifically destroy foreign material. (Compare *humoral immunity*.)

**Chagas' disease:** Infection by *Trypanosoma cruzi*, transmitted by reduviid bugs. The disease was discovered and described by Carlos Chagas of Brazil. It is characterized by an acute course in children with fever, encephalitis, and inflammation of the heart muscle (often life-threatening or fatal), and a chronic course in adults leading to heart disease and heart failure. Also called "American trypanosomiasis." (See also *trypanosomiasis*.)

**Chemoprophylaxis:** The prevention of disease by the use of drugs or chemicals.

**Chemotherapy:** The use of specific chemical agents to arrest the progress of, or eradicate, disease in the body.

**Cholera:** A severe diarrheal disease caused by the bacterium *Vibrio cholerae*.

**Chromosomes:** The rodlike structures of a cell's nucleus that store and transmit genetic information; the physical structures that contain genes.

**Chronic:** Lingering, lasting, as opposed to acute.

**Clone:** A group of genetically identical cells or organisms produced asexually from a common ancestor.

**Cold chain:** The means whereby vaccines can be transferred from the manufacturer to the physician in the field at a sufficiently low temperature to ensure the effectiveness of the vaccines. Some of the important childhood vaccines require continuous refrigeration.

**Complement:** A protein complex in plasma that causes the lysis of bacteria and other pathogens that react with antibody.

**Complementary DNA (cDNA):** DNA that is complementary to messenger RNA; used for cloning or as a probe in DNA hybridization studies.

**Congenital:** Existing at birth.

**Cross-reactivity:** The property of an organism able to provoke an immunologic reaction against a different organism. The tuberculosis vaccine BCG, for example, is an attenuated strain of *Mycobacterium bovis* (a bovine tuberculosis) that provokes the immune reaction against *M. tuberculosis*, the cause of human tuberculosis.

**DDT (dichloro-diphenyl-trichloro-ethane):** An insecticide used to control mosquitoes and other vectors of tropical diseases.

**Dengue fever:** An acute febrile disease caused by an arbovirus, transmitted by mosquitoes of the genus *Aedes*, and characterized by fever, severe pains in the head, eyes, muscles, and joints, and a skin eruption.

**Diagnostic technology:** A technology used to determine the presence or absence of disease, and/or to characterize the extent of the disease.

**Diarrheal diseases:** Diseases characterized by the passage of loose watery stools, usually at more frequent than normal intervals. The dehydration that accompanies diarrhea is the cause of great morbidity and mortality, particularly among infants and children.

**DNA (deoxyribonucleic acid):** A nucleic acid, containing the sugar ribose, that is found in cell nuclei and is the carrier of genetic information. (Compare *RNA*.)

**DNA-DNA hybridization:** See *nucleic acid hybridization*.

**DNA probe:** A sequence of DNA that is used to detect the presence of a particular nucleotide sequence in a sample of DNA.

**DNA sequence:** The order of nucleotide bases in the DNA helix.

**Dysentery:** Inflammation of the intestine characterized by pain, intense diarrhea, and the passage of mucus and blood.

**Electrolytes:** Any compound that dissociates into charged ions in solution and can conduct a current of electricity. A balance of these in body fluids is necessary for the body to function normally.

**Elephantiasis:** The enormous swelling of a limb, usually a leg, as a result of lymphatic obstruction by filarial worms, followed by thickening of the skin and subcutaneous tissues.

**Emesis:** Vomiting.

**Encephalitis:** Inflammation of the tissues of the brain.

**Endemic:** Constantly present or persistent within a given geographic area, a term used to refer to a human disease or an infectious agent. (Compare *enzootic*, *epidemic*.)

**Enteric:** Pertaining to the intestine.

**Enterotoxigenic:** Capable of producing a toxin within the intestine. Some strains of *E. coli* cause disease by producing such a toxin.

**Entomology:** The scientific study of insects.

**Environmental control:** The control of disease through measures involving the alteration of the physical environment to eliminate the conditions necessary for the survival of the insects or other organisms that transmit or harbor the agents of disease.

**Enzootic:** The constant presence or persistence of an animal disease or infectious agent within a given geographic area; the animal counterpart of endemic. (Compare *endemic*, *epizootic*.)

**Enzyme:** Any of a group of catalytic proteins that are produced by living cells and that mediate and promote the chemical processes of life without themselves being altered or destroyed.

**Epidemic:** A sudden increase in the incidence rate of a human illness, affecting large numbers of people and spread over a wide area. (Compare *endemic*, *epizootic*.)

**Epidemiology:** The scientific study of the distribution and occurrence of diseases and health conditions, and their determinants.

**Epitope:** A structural part of an antigen that is responsible for an antibody response against that antigen. Also called "antigenic determinant."

**Epizootic:** Affecting many animals in one region simultaneously; the animal counterpart of epidemic. (Compare *enzootic*, *epidemic*.)

**Erythrocytes:** Red blood cells.

**Escherichia coli:** A species of rod-shaped bacteria that inhabit the normal intestinal tract of vertebrates. Some strains cause intestinal disease and diarrhea in humans through at least three mechanisms: enterotoxigenic *E. coli* produces toxins that cause excessive fluid production in the intestine; enteroinvasive *E. coli* invades the cells of the intestinal wall; enteropathogenic *E. coli* produces a toxin that causes disease in infants. Many nonpathogenic strains of *E. coli* are used as hosts in recombinant DNA technologies.

**Etiologic:** Causative.

**False negative:** A negative test result in an individual with the disease in question, i.e., the patient is incorrectly diagnosed as not having a particular disease.

**False positive:** A positive test result in an individual who does not have the disease in question, i.e., the individual is incorrectly diagnosed as having a particular disease.

**Fertility rate:** The annual number of live births per 1,000 women of child bearing age (15 to 49 years) in a defined population.

**Filaria:** Parasitic nematode worms, named for their threadlike appearance.

**Filariasis:** A disease in humans due to infection with filarial worms, such as *Wuchereria bancrofti*, *Brugia malayi* (transmitted by mosquitoes), and *Onchocerca volvulus* (transmitted by blackflies). Adults of *W. bancrofti* and *B. malayi* live in the human lymphatic system and connective tissues, where they may cause obstruction. The immature

worms (microfilariae) migrate to the host's bloodstream. Completion of the parasite's life cycle is dependent on passage through a mosquito.

**Fluke:** The common name for a large number of species of parasitic flatworms that form the class Trematoda.

**Gamete:** A mature germ cell with one set of chromosomes, capable of fusing with another gamete and forming a new, genetically distinct, individual.

**Gametocyte:** A life cycle stage of *Plasmodium*, the malarial agent; this stage infects mosquitoes after the mosquito bites an infected human (or other mammal), and gives rise to the gamete, or, sexual stage, of the parasite.

**Gene:** The basic unit of heredity; an ordered sequence of nucleotides comprising a segment of DNA. A gene contains the sequence of DNA that encodes one polypeptide chain (via RNA).

**Genome:** The genetic endowment of an organism or individual.

**Genus (pi., genera):** A taxonomic category that includes groups of closely related species of plants or animals.

**Glycoprotein:** A protein with attached sugar groups.

**Helminth:** Any parasitic worm.

**Hemorrhagic fever:** A severe complication of some viral diseases that involves internal or external bleeding. Several arboviruses sometimes cause epidemic outbreaks of hemorrhagic fever.

**Host:** 1. In the context of parasitology, a living organism that harbors a parasite. Definitive hosts harbor the adult or sexual stage of a parasite; intermediate hosts harbor the larval or asexual stages of a parasite. 2. In the context of recombinant DNA technology, the organism into which a scientist inserts foreign DNA.

**Humoral immunity:** Immunity associated with antibodies that circulate in the blood. (Compare *cell-mediated immunity*.)

**Hybridoma:** Product of fusion between a myeloma cell (which divides continuously in culture and is "immortal") and a lymphocyte (antibody-producing cell); the resulting cell grows in culture and produces the specific antibody produced by the parent lymphocyte (a monoclonal antibody).

**Hypernatremia:** An abnormally high concentration of sodium ions in the blood.

**Hyponozoite:** Forms of some species of *Plasmodium*, the cause of malaria, that remain dormant in liver cells, sometimes for many years, retaining their ability to activate an infection and cause acute malaria.

**Hyponatremia:** An abnormally low concentration of sodium ions in blood. Hyponatremia often accompanies severe diarrhea.

**Immune:** Protected against disease by innate or acquired immunity.

**Immune response:** The reaction of an organism to invasion by a foreign substance. Immune responses are often complex, and may involve the production of antibodies from special cells (B-lymphocytes), as well as a varying set of physical and chemical responses from other cells of the immune system.

**Immune serum:** Blood serum that contains antibodies and can be used to confer passive immunity to a variety of diseases.

**Immune system:** A specialized group of body cells and cell products that respond to foreign organisms and substances in the body. The cell products are largely immunoglobulins (antibodies). Some lymphocytes and various other cells of the immune system directly attack foreign organisms.

**Immunity:** A living organism's condition of being able or capacity to resist a particular disease. Innate immunity is natural or inherited. Acquired immunity may be active or passive. Active immunity results from previous exposure to the disease-causing agent or vaccination; passive immunity is the result of transfer of preformed antibodies in immune serum or from mother to fetus. (See also *cell-mediated immunity*, *humoral immunity*.)

**Immunization:** The deliberate introduction of an antigenic substance (vaccine) or antibodies into an individual, with the aim of producing active or passive immunity to a disease. (Compare *vaccination*.)

**Immunization technology:** Interventions designed to render individuals resistant to disease if they are exposed to a disease-causing agent. Vaccines are the most important tools of immunization.

**Immunoassay:** The use of antibodies to identify and quantify substances. The binding of antibodies to antigen, the substance being measured, is often accompanied by tracers such as radioisotopes.

**Immunodiagnosis:** A process whereby specified immunologic characteristics of cells, serum, or biologic specimens are determined for the purpose of diagnosing disease.

**Immunogenic:** Able to cause an immune response.

**Immunoglobulin:** Any of a set of serum glycoprotein molecules that have the ability to bind other molecules with a high degree of specificity. Immunoglobulins include all the antibodies.

**Immunology:** The scientific study of immunity, induced sensitivity, and allergy.

**Immunosuppression:** Suppression of the immunologic response.

**Incidence:** The frequency of new occurrences of disease within a defined time interval in a defined population. Incidence rate is the number of new cases

- of specified disease divided by the number of people in a population over a specified period of time, usually 1 year.
- Incubation:** The time between infection by a disease-causing organism and the appearance of disease.
- Infant mortality rate:** Number of deaths among children less than 1 year old as a fraction of the total number of live births in a year.
- Infection:** The entry and proliferation of any pathogenic organism in another organism.
- Innate immunity:** Immunity that is genetically determined at birth.
- Inoculate:** To introduce immunologically active material (e.g., an antibody or antigen) into, especially in order to treat or prevent a disease.
- Insecticide:** A substance capable of killing insects.
- Insect vector:** An insect that can transmit a disease-producing organism from one human or animal to another.
- Integrated pest management (IPM):** The use of a combination of biological, chemical, environmental measures to control vectors that transmit tropical diseases to humans or other animals.
- Intermediate host:** See **host**.
- In vitro:** Literally, in glass; pertaining to a biological process or reaction taking place in an artificial environment, usually a laboratory. Sometimes the term is used to include the growth of cells from multicellular organisms under cell culture conditions.
- In vivo:** Literally, in the living; pertaining to a biological process or reaction taking place in a living cell or organism.
- Kinetoplastid:** Characteristic structure at the base of the flagellum in certain protozoa (e.g., *Leishmania* spp. and *Trypanosoma* spp.).
- Larvicide:** A substance capable of killing insect larvae.
- Leishmania:** A genus of flagellated parasitic protozoans that cause leishmaniasis.
- Leishmaniasis:** Any of several infections caused by *Leishmania* spp., transmitted by sandflies. Cutaneous leishmaniasis is a skin ulcer caused by *L. mexicana* (New World) or *L. tropica* (Old World). Mucocutaneous leishmaniasis is an ulceration of the nose and throat caused by *L. braziliensis*, occurring in tropical America. Visceral leishmaniasis, also called “kala-azar,” is a generalized and internal disease caused by *L. donovani* (New and Old World).
- Lepromatous leprosy:** See **leprosy**.
- Leprosy:** A chronic, infectious, granulomatous disease of humans caused by the bacillus *Mycobacterium leprae*. The disease occurs almost exclusively in tropical and subtropical regions, and ranges in severity from localized, spontaneously remitting lesions (tuberculoid leprosy) to malignant lesions with progressive anesthesia, paralysis, ulceration, nutritive disturbances, gangrene, and mutilation (lepromatous leprosy). Also called “Hansen’s disease.”
- Lesion:** A wound, injury, or one of the individual points or patches of a multifocal disease.
- Lower respiratory tract infection (LRTI):** See *acute respiratory infections*.
- Lymphocytes:** Specialized white blood cells involved in the body’s immune response. B-lymphocytes originate in the bone marrow and when stimulated by antigen produce circulating antibodies (humoral immunity). T-lymphocytes originate in the thymus and engage in a type of defence that does not depend directly on antibody attack (cell-mediated immunity).
- Lyophilized:** Freeze-dried.
- Microphage:** A type of large, ameba-like cell, found in the blood and lymph, which consumes foreign particles, including bacteria and parasites.
- Malaria:** Any of a group of human febrile diseases caused by infection of red blood cells by protozoan parasites of the genus *Plasmodium*, transmitted by mosquitoes of the genus *Anopheles*. Four species of *Plasmodium* cause malaria in humans: *P. falciparum*, *P. vivax*, *P. malariae*, and *P. ovale*. *P. vivax* and *P. ovale* have a persistent stage in the liver that causes relapses. Many other species of *Plasmodium* infect monkeys, rodents, birds, and reptiles.
- Merozoite:** A life cycle stage of the malarial agent *Plasmodium*; this stage develops in the vertebrate host’s liver, then enters the circulatory system and infects red blood cells.
- Messenger RNA (mRNA):** RNA that serves as the template for protein synthesis; it carries the transcribed genetic code from DNA and directs protein synthesis.
- Microfilariae:** Slender, motile prelarval forms of filarial nematodes, the parasites that cause filariasis.
- Micro-organism:** A minute, microscopic, or submicroscopic living organism. Examples are bacteria, mycoplasma, viruses, and protozoa.
- Molecular biology:** The study of biology at the level of individual molecules, such as proteins and DNA.
- Molluscicide:** Any chemical agent used to kill mollusks; in the context of tropical diseases, snails necessary in the life cycles of schistosomes are the most important targets.
- Monoclonal antibodies (MAbs):** Homogeneous antibodies derived from clones of a single cell. MAbs recognize only one chemical structure. They are useful in a variety of industrial and medical capacities since they have remarkable specificity.
- Monocytes:** Phagocytic, large white blood cells, containing one nucleus.

**Morbidity:** The condition of being diseased.

**Morphology:** The study of the configuration or structure of organisms.

**Mortality rate:** The death rate, often made explicit for a particular characteristic, e.g., age, sex, or specific cause of death. A mortality rate contains three essential elements: 1) the number of people in a population group exposed to the risk of death; 2) a time factor; 3) the number of deaths occurring in the exposed population during a certain time period.

**Mycobacterial diseases:** A group of human and animal diseases caused by species of the bacterial genus *Mycobacterium*. Important human mycobacterial diseases are tuberculosis and leprosy.

**Mycology:** The scientific study of fungi.

**Mycoplasma:** Micro-organisms similar to bacteria, but lacking a rigid cell wall.

**Nagana:** A disease of cattle and other livestock in Africa, caused by *Trypanosoma brucei*, the cause of African sleeping sickness in humans.

**Necrosis:** Death of tissue.

**Nematodes:** Elongated, cylindrical worms, also called roundworms, many of which are parasites. Hookworm and the worms that cause trichinosis are nematodes. The filarial worms also belong to this group.

**Nucleic acid:** Macromolecules composed of sequences of nucleotides. There are two kinds of nucleic acids: DNA, which contains the sugar deoxyribose, and RNA, which contains the sugar ribose.

**Nucleic acid hybridization:** Matching of either DNA or RNA (depending on the organism) from an unknown organism with DNA or RNA from a known organism. This method is used in tropical disease research for identifying species and strains of pathogens.

**Nucleotide:** A structural unit of nucleic acid, consisting of a base, a sugar, and a phosphate molecule.

**Oligonucleotides:** Short segments of DNA or RNA, made up of a few (2 to 10) nucleotides.

**Onchocerciasis:** An infection of humans with the filarial worm *Onchocerca volvulus*, transmitted by the bite of blood-sucking blackflies. The disease is generally characterized by skin nodules that can become fibrous and calcified. Also called "African river blindness," for the blindness that occurs when the worms invade the eye.

**Oral dehydration therapy (ORT):** The treatment or prevention of dehydration due to diarrhea by a specific water solution of electrolytes and glucose (salts and sugar) taken by mouth.

**Oropouche fever:** An arboviral disease transmitted by biting midges (*Culicoides* spp.). Symptoms include anorexia, rash, and joint and muscle pain.

**Orphan Drug Act: Public Law 97-414**, which charges the U.S. Government with identifying and promoting orphan products, defined as drugs and devices for rare diseases.

**Pandemic:** Worldwide epidemic.

**Parasite:** An organism living in or on another living organism, obtaining from the host organism part or all of its organic nutriment.

**Parasitemia:** The presence of parasites in the blood.

**Parasitic disease:** A disease caused by a parasite. Examples are malaria, schistosomiasis, trypanosomiasis, leishmaniasis, and filariasis.

**Parasitology:** The scientific study of the relationship between parasites and their hosts.

**Passive immunity:** Immunity that is the result of the transfer of preformed antibodies in immune serum or from mother to fetus. (Compare active immunity.)

**Pathogen:** A specific causative agent (e.g., a virus or bacterium) of a disease.

**Pathogenesis:** The mode of origin and development of a disease process.

**Pathogenicity:** The condition of causing disease.

**Pathology:** The scientific study of the cause of disease, and the associated structural and functional changes that result from disease.

**Pertussis:** An infectious inflammatory respiratory disease of children caused by the bacterium *Bordetella pertussis*. The disease is characterized by explosive attacks of coughing ending in an inspiratory whoop. Also known as "whooping cough."

**Phage:** See *bacteriophage*.

**Phagocytosis:** Consumption of foreign particles (e.g., bacteria) by cells that use amoeboid movement to surround the particle and then digest it.

**Phenotype:** The observable characteristics of a strain or species.

**Phlebotomine sandflies:** Insect vectors of *Leishmania* spp., the agents of leishmaniasis.

**Plasmid:** An extrachromosomal, self-replicating, circular segment of DNA. Plasmids can be used as "vectors" for cloning foreign DNA in bacterial "host" cells.

**Plasmodium:** The genus of protozoans that cause malaria in humans and other animals.

**Pneumonia:** An acute or chronic inflammation of the lungs, which can be caused by a variety of microorganisms.

**Polypeptide:** A sequence of amino acids (at least three) joined in a chain.

**Prevalence rate:** The number of existing cases of a disease in a defined population at a particular time, or over a specified time period.

**Probe:** See *DNA probe*.

**Prophylaxis:** The prevention of disease.

**Protozoa:** A phylum of one-celled animals, a few of which cause disease in humans. Examples are the causes of malaria, leishmaniasis, and trypanosomiasis.

**Reagent:** A substance that takes part in a chemical reaction.

**Recombinant DNA:** The hybrid DNA produced by joining pieces of DNA from different sources together in vitro.

**Recombinant DNA techniques:** Techniques that allow specific segments of DNA to be isolated and inserted into a bacterium or other host (e. g., yeast, bacteria) in a form that will allow the DNA segment to be replicated and expressed as the cellular host multiplies.

**Recrudescence:** The reappearance of a morbid process or its symptoms after a period of improvement.

**Reduviid bug:** A blood-sucking bug in the Reduviid family that is the vector of *Trypanosoma cruzi*, the agent of Chagas' disease.

**Reservoir:** Any person, animal, arthropod, plant, soil, or substance (or combination of these) in which an infectious agent lives in such manner that it can be transmitted to a susceptible host.

**Respiratory syncytial virus (RSV):** The most important cause of lower respiratory disease (pneumonia and bronchiolitis) in children under 2 years of age.

**Restriction enzymes:** Bacterial enzymes that cut DNA at specific nucleotide sequences.

**Rhinovirus:** One of many virus families that cause upper respiratory disease, Rhinovirus is a cause of the "common cold."

**Rickettsia:** A group of rod-shaped micro-organisms which may be transmitted by arthropods and are responsible for some human diseases such as Rocky Mountain spotted fever and epidemic typhus.

**River blindness:** See *onchocerciasis*.

**RNA (ribonucleic acid):** A nucleic acid, containing the sugar ribose, that is found in cytoplasm and some cell nuclei and is associated with the control of cellular chemical activities. In its three forms—messenger RNA, transfer RNA, and ribosomal RNA—RNA assists in translating the genetic message of DNA into the finished protein. (Compare *DNA*.)

**RNA-RNA hybridization:** See *nucleic acid hybridization*.

**Rotavirus:** Any of a group of viruses (round in shape) which are the major cause of diarrhea] disease in infants and children.

**Salmonella:** A genus of bacteria that can cause diarrheal disease.

**Schistosoma:** The genus of blood flukes that cause schistosomiasis.

**Schistosomiasis:** A chronic, debilitating infection by worms of the genus *Schistosoma* ("blood flukes"). The three most important species in humans are: *S. mansoni*, *S. haematobium*, and *S. japonicum*.

**Sensitivity:** The ability of a diagnostic test accurately to diagnose a disease or condition when the disease or condition is present. High sensitivity means few false negatives. (Compare *specificity*.)

**Serotype:** A group of closely related micro-organisms that are distinguished by their possession of a common set of antigenic characteristics. The term also refers to the antigen set characteristic of such a group.

**Serum:** The clear liquid which separates in the clotting of blood and which contains the antibodies that were present in the whole blood.

**Shigella:** A genus of bacteria, some of which can cause diarrheal disease.

**Species:** A taxonomic category that includes closely related, morphologically similar individuals that actually or potentially interbreed; the principal subdivision of a genus.

**Species complex:** A group of two or more closely related species that can only be differentiated by cytogenetic analysis or cross-breeding experiments.

**Specificity:** The ability of a diagnostic test correctly to determine that an individual does not have a specific disease or condition. High specificity means few false positives. (Compare *sensitivity*.)

**Sporozoite:** A life cycle stage of the malarial agent *Plasmodium*; this is the stage injected by the mosquito vector into the vertebrate host's bloodstream.

**Strain:** A group of organisms of the same species having a distinctive quality or characteristic (biochemical, pathogenic, or other) that can be differentiated, but are not different enough to constitute a separate species.

**Subunit vaccine:** A vaccine that contains only portions of an antigenic molecule of a pathogen. Subunit vaccines can be prepared by using recombinant DNA technology to produce all or part of the antigenic molecule or by artificial (chemical) synthesis of short peptides.

**Surveillance:** Constant observation of an area to determine the level of disease activity.

**TDR:** The acronym for the Special Program for Research and Training in Tropical Diseases, sponsored jointly by the U.N. Development Program, the World Bank, and the World Health Organization.

**TDR diseases:** The six diseases singled out for attention by the Special Program for Research and Training in Tropical Diseases (TDR): malaria, schistosomiasis, trypanosomiasis, filariasis, leishmaniasis, and leprosy.

**Therapeutic technology:** A technology that cures or relieves the symptoms of a disease or other medical condition.

**Titer:** The lowest concentration (highest dilution) of an active substance (e.g., antibody in serum) that causes a discernible reaction with another substance.

**T-lymphocytes:** See *lymphocytes*.

**Toxin:** A substance, produced in some cases by microorganisms, which is toxic to other living organisms.

**Transcription:** The synthesis of messenger RNA on a DNA template; the resulting RNA sequence is complementary to the DNA sequence. This is the first step in gene expression. (Compare *translation*.)

**Translation:** The process in which the genetic code contained in the nucleotide base sequence of messenger RNA directs the synthesis of a specific order of amino acids to produce a protein. (Compare *transcription*.)

**Transmission:** The passage of a pathogen from one host to another host, or from vector to host.

**Trematode:** Any of a group of parasitic flatworms, including the flukes, of the phylum Platyhelminthes. Schistosomes are important human trematode parasites.

**Trypanosoma:** A genus of slender, polymorphic, parasitic protozoans that cause trypanosomiasis.

**Trypanosomiasis:** Any of several diseases caused by infection with species of the genus *Trypanosoma*. The important human diseases are African sleeping sickness (also called African trypanosomiasis) and Chagas' disease (also called American trypanosomiasis). African sleeping sickness is caused by *T. brucei rhodesiense* in east Africa or *T. b. gambiense* in west Africa, both transmitted by the tsetse fly. Chagas' disease is caused by *T. cruzi*, transmitted by blood-sucking reduviid bugs.

**Tsetse flies:** Any of several two-winged flies of the genus *Glossina* that occur in Africa south of the Sahara; medically important as vectors of African trypanosomiasis.

**Tubercle bacillus:** A bacillus causing tuberculosis; usually refers to *Mycobacterium tuberculosis*, the principal cause of human tuberculosis.

**Tuberculoid leprosy:** See *leprosy*.

**Tuberculosis:** A chronic infectious disease of humans and animals caused by any of several species of mycobacteria. It usually begins with lesions in the lung, but can spread to other parts of the body.

**Upper respiratory tract infection (URTI):** See *acute respiratory infections*.

**Vaccination:** The deliberate introduction of an antigenic substance (vaccine) into an individual, with

the aim of producing active immunity to a disease. (Compare *immunization*.)

**Vaccine:** A preparation of living, attenuated, or killed bacteria or viruses, fractions thereof, or synthesized antigens identical or similar to those found in the disease-causing organisms, that is administered to produce or increase immunity to a particular disease.

**Vaccinia virus:** The organism that causes cowpox; its injection into humans results in immunity to the related smallpox virus.

**Vector:** A transmission agent: 1. In the context of medicine, a carrier of disease; usage commonly refers to arthropods (e.g., mosquitoes, sandflies, ticks) or rodents. 2. In the context of recombinant DNA technology, the DNA molecule used to introduce foreign DNA into host cells; vectors include plasmids, bacteriophages, and other forms of DNA.

**Vector bionomics:** The study of the habits (feeding, resting, and breeding) of vectors of disease and variations among different strains and in different locales.

**Vector-borne disease:** A disease transmitted by an insect or other vector. Such diseases include malaria, trypanosomiasis, and arboviral infections.

**Vector control technology:** A technology aimed at controlling the vectors that transmit disease or other organisms (e.g., snails) that are not true vectors, but serve as intermediate hosts of human or other animal disease organisms.

**Vibrio cholerae:** The bacterium that causes cholera.

**Virology:** The study of viruses.

**Virulence:** The degree and severity with which a pathogen is able to infect a population and cause disease.

**Virus:** Any of a large group of submicroscopic agents infecting plants, animals, and bacteria and characterized by a total dependence on living cells for reproduction and by a lack of independent metabolism. A fully formed virus consists of nucleic acid (DNA or RNA) surrounded by a protein or protein and lipid coat.

**Water-borne disease:** A disease transmitted through contaminated water. Most diarrheal diseases can be water borne.

**Whooping cough:** See *Pertussis*.

**Wild-type:** The most frequently encountered phenotype in natural breeding populations.

**Xenodiagnosis:** A technique in which an intermediate host or vector is used to diagnose the presence of parasites in humans; e.g., reduviid bugs are permitted to feed on someone suspected of having Chagas' disease, and later, the bugs are examined for the presence of *T. cruzi* parasites.

**Yellow fever:** An acute febrile disease caused by an arbovirus that is transmitted by mosquitoes. Symptoms include a high fever, jaundice, black vomit, and anuria (absence of urine excretion). The virus that causes jungle/sylvan yellow fever is maintained

in monkey reservoir hosts; urban yellow fever refers to transmission of the same virus to humans.

**Zoonosis:** A disease primarily of animals that is transmissible to humans under natural conditions.