Immunological terms

Since VON PIRQUET introduced the concept of allergy in 1907, the definitions always difficult to interpret have been augmented by adopting plenty of concepts from the Anglo-Saxon literature. Concepts that can only insufficiently be defined and substantiated cannot be taught well either. In the field of immunology, the classical Central European concept of allergology and many recent versions from the Anglo-Saxon literature are now used simultaneously. Consequently, it may appear expedient to give a survey of the most frequent terms in alphabetical order and to try to make concise definitions.

Allergy (VON PIRQUET, 1906)
Changed reactivity after previous contact of antigens (= secondary response); the outcome is a specific hypersensitiveness, which appears as an immediate or as retarded type (tuberculin type).

Allogenous
homologous, originating from a genetically different individual of the same kind.

Anaphylatoxins
proteins released as fragments of complement factors (C_{3a} and C_{5a}) and thus releasing histamin substances.

Anaphylaxis (RICHET, 1902)
Allergic immediate reaction, dependent on reagin; the H-substances (histamin or histamin-like substances) released thereby may provoke urticaria, Quincke-edema or anaphylactic shock.

Anergy
Lack of hypersensibility reactions after previous sensitisation; a «positive» anergy is obtained by desensitisation, a «negative» one by illnesses, cytostatics, radiation (= largely identical with immunological paralysis).

Antigen
A heterogeneous substance or an autogenous substance with changed structures becomes an antigen by developing specific antibodies.

Antigenous determinant
Minimum reacting superficial unit of the antigen accounting for the specificity of the resulting antibody.

Antibodies
Specific proteins developed through stimuli from antigens (immunoglobulins; which see).

Autogenous
From the same individual (autologous); used for transfusions, implantations, transplants.

B-cells
GOOD (1962) divided the «immuno-competent cells» into B-cells (bone-marrow-derived cells, formerly referred to as «bursa»-derivatives) and T-cells (thymocytes). They can be differentiated by indirect methods, morphologically there are flowing transitions. In question are cell-derivatives of the reticulohistiocytary system (histiocytes, monocytes, mesothelic cells, large lymphocytes), which have preserved the pluripotency of mesenchymal cells. Thus they can through stimuli from antigens rebuild the space of cytoplasm into a synthesis of highly specific macromolecules (immunoglobulins) and eliminate the latter by secretion (IgG) into the humoral system. They run through a phase of synthesis and a phase of secretion.

Chimerism
Chimaerae are living beings consisting of genetically different structures. Derived from chimaera, which is a fire-vomiting fabulous being of the Greek mythology, whose body was composed of parts of a goat, lion and snake.

Complement system
Compound system of 20 different protein fractions (referred to as C_1–C_9), which releases anaphylatoxin and leukotactic factors, promotes the opsonization and leads to cytolysis. The system working after the amplifier principle in the sense of a chain reaction needs essentially calcium (Ca) and magnesium (Mg).

Enhancement phenomenon
«Immune-enhancement» means the accelerated growth of malign tumours in test animals if preceded by a sensitisation with the antigen of the same tumour.

Fab-region
Part of immunoglobulin binding antibodies.

Fab-fragment
Monovalent fragment of immunoglobulin having a molecular weight of 50,000, isolated by enzymatic disintegration of immunoglobulin by means of papain or plasmin.

$F(ab)_2$-fragment
Bivalent fragment of antibodies, which comes into existence by enzymatic disintegration with pepsin; molecular weight: 100,000.

Fc-fragment
Fragment of the Fc-constituent of the immunoglobulin molecule, after enzymatic disintegration by means of plasmin or papain.

Fc-region
Complement-binding (constant) part of the immunoglobulin molecule.

Haptenes
Low-molecular antigen fragments, which cannot sensitise but can react with antibodies.

Heterotopic
at a topographically different site.

Immunbiology
The science of processes and mechanisms serving for the protection of the individual biological integrity against foreign substances.

Immuncompetent cells
Cells of the lymphatic and reticulo-histiocytary system, which can be stimulated by antigen contact to form specific antibodies.

Immunocytolysis
Dissolution of cells by antigen-antibody contact; the antibodies are cell-specific (IgM) or complement causes the cytolysis.

Immundeficiency
Deficient immunity by a deficit of immunoglobulins.

Immun-electrophoresis
Technique of identifying various serum proteins: the individual fractions are first separated electrophoretically, then precipitated with antiserum. The precipitation lines indicate the quantities and molecular sizes.

Immunglobulins
Highly molecular antigen-specific protein bodies, which are synthetized in mononuclear cells after contact with antigens. According to the size of molecules and site of formation they remain cell-bounded (IgM, IgA) or are eliminated into the humoral system (IgG, secretory IgA), then often called humoral antibodies. So far, IgA, IgM, IgG, IgE and IgD are distinguished. Low-molecular antibodies (IgG, gamma-globulin, $gamma_2$-fraction) travel electrophoretically the slowest. The molecular weight is 156,000–170,000, the sedimentation constant in the ultracentrifuge $S_{20} = 6.5–7 \times 10^{-13}$, the size is 250–320 × 50 Å.

Higher molecular antibodies (IgM, $beta_2$-globulin-, $gamma_1$-fraction) are electrophoretically between the $beta_1$ and gamma-fractions. The molecular weight is between 500,000 and 1,000,000, the sedimentation constant $S_{20} = 15 – 19 \times 10^{-13}$, the size somewhere between 500–900 × 50 Å.

Immuninsufficiency
Primary or secondary lack of immunoglobulins, with immuno-pareses resulting therefrom.

Immunity
To be immune from the sickening effect of foreign substances getting into the body, by means of synthetising autogenous proteins (immunoglobulins). A specific immunity is obtained by previous contact with the antigen (example: vaccinations).

Immunmodulation
(Arteficial) changing of the Immunsituation.

Immunocytes (F. SCHMID, 1963; DAMASHEK, 1964)
Mononuclear cells transformed functionally into cells synthetizing immunoglobulin. The morphological appearance depends on the maturing stage of the immunoglobulin. During the stage of synthesis they take up organic acids, become deeply basophile, pyroninpositive (RNA-concentration), the nucleus of the large-volume cells becomes peripherical as a compact ergastoplasm develops. This stage corresponds to the «plasma cell» in the classical meaning. In the stage of secretion, immunoglobulins (especially IgG) are secreted via cisterns (so-called vacuoles) into the humoral system.

Immunogenous:
causing the formation of specific antibodies.

Immunoparalysis
Failure (collapse) of the immunizing systems.

Immunoparesis
Deficiency of the immunizing system; the stimulation by antigens does not cause any adequate formation of antibodies.

Immun-reactions
Cellular or humoral reactions to antigens and antibodies. They include: sensitization, cytolysis, agglutination, precipitation. Common methods are: agglutination reaction, inhibitory test by agglutination, precipitation, neutralisation test (viral serum), complement-binding reaction, H_3-thymidin test, macrophages-migration-inhibitory test, etc.

Immunsuppression
Artificial suppression of the immunizing reaction of the organism by medicaments (cytostatics, antibiotics), radiation or immunologically (antilymphocyte serum).

Immuntolerance
Antigenic substances do not provoke the formation of antibodies; they are tolerated. The prenatal tolerance immunity is a prerequisite for the uninterrupted development of the fetus, which contains also foreign (paternal) protein structures.

Immun-Transfer
Immunoglobulins and their metabolites can be transferred « passive» with cells of sensitized organisms (peritoneal exudate cells, lymphocytes, meningeal, pleura cells, spleen cells, leukocytes, by exchange-transfusions). The recipient organism reacts within days to months as if it had been in contact with the antigen (example: passive transfer of tuberculin allergy with cells).

Interferons
Acid-resisting proteins, which are eliminated by cells in virus infections and blocks certain phases of the virus synthesis.

Isogenous
Syngenous = isologous, originating from a genetically identical individual (twin).

Killer cells
Macrophages with cytolytic functions; they may be identical with monocytes, which eat autogenous cells if these carry foreign substances (tumour substances) clinging to their cell membranes and thus give the body an impression of being foreign.

Mediators
Mediators (between chemical reactions).

Memory cells
Hypothetical vehicles of the «immune memory». The body forms antibodies (Booster effect, secondary response) faster and more intensively after second contact with antigens than after first contact.

Natural resistance
Individual, non-specific capacity to cope with heterogeneous noxae threatening the own existence or integrity.

Opsonization
Promotion of phagocytosis by the activated Fc-region of the antibody molecule.

Orthotop
= at an anatomically normal site.

Phagocytosis
«Eating» = ingestion of solid particles by cells.

Pinocytosis
«Drinking» = taking up liquids by cells.

Plasma cells (see immunocytes)
Deep basophile, mononuclear cells with marginal nucleus. Cells of the reticulo-histiocytary system (B-cells) in the synthetic stage of antibody formation.

Precipitation
Immunizing reaction provoking a sedimentary precipitate through contact of antigen-antibody. Demonstrable in test tube or by gel-diffusion test.

Reagines
Bivalent immunoglobulins (IgE) with strong ability of binding to cells (granulocytes, mast-cells). From the complex antigen IgE + cellular surface, vasoactive amins capable of provoking anaphylaxis are released with the loss of the basophile granules (= acid complexes).

Receptors
Areas (mostly cytomembranes) capable of specific stimulations and responses to stimulations.

Runt disease
The term is derived from the dwarf cattle (Runt) and means stunted growth caused by antigen-antibody antagonism in the maturing organism. The immunologically riper implant «terrorizes» the immunologically less ripe host tissue in the form of achronic auto-aggressional disease, which leads to «stunted growth» .

Thymosin
Thymus hormone

Transfer factor
Substances in cellular extracts capable of transferring passively and temporarily cellular properties such as the hypersensitivity to tuberculin.

T-cells
Thymocytes i. e. small lymphatic cells of the colonization family of the thymus; they are representatives of one of the three immunity systems; their absence in thymus aplasia or dysplasia provokes the characteristic «syndromes of lack of antibodies» and lowered resistance to infection.

Xenogenous
Heterologous, originating from another species or animal.