

This heading is primarily concerned with proteins, enzymes, nucleic acids, certain other peptides, and genetic manipulation

Explanation of heading subject-matter and relationship with other headings

This is the *general* heading for the following categories of materials:
substances—

- . proteins (*including* monoclonal antibodies)
 - . enzymes
 - . nucleic acids (*including* transformation vectors *eg* plasmids)
 - . peptides containing at least two different α amino acid units in known sequence
 - . peptides consisting of less than 10 identical α amino acid units
 - . indefinite mixtures of amino acids obtained by degradation of proteins and peptides
 - . enzyme inhibitors of proteinaceous character
- derivatives—
- . functional and substitution derivatives of the above substances
 - . addition and condensation products of the above substances with other substances

It is also the *general* heading for processes for obtaining or purifying the above materials

- . *but* the production of proteins, enzymes, nucleic acids and other compounds listed above using the techniques grouped under the term “combinatorial chemistry”, that is, the synthesis of large arrays (known as “chemical libraries”) of diverse proteins, enzymes, nucleic acids and other compounds listed above by the systematic and repetitive connection of a set of different “building blocks” of different structure—C2L, Combinatorial chemistry and chemical libraries
- . . *However* proteins, enzymes, nucleic acids and other compounds listed above of defined structure produced by combinatorial chemistry are classified in this heading

In addition, this is the *general* heading for genetic manipulation by insertion of specifically-defined DNA and/or RNA into biological cells

This heading is *residual* for the following subject matter:

- . compositions containing the above materials or degradation products thereof, *and for which no provision exists in other headings*
- . processes and apparatus for treating the above materials, *and for which no provision exists in other headings*
- . articles made from and uses of the above materials and compositions, *not covered by other headings insofar as novelty resides in the choice of material, or composition*

Excluded are:

- . compositions for food—A2B, Food preparations
- . fire-fighting foams stabilised after foaming—A5A, Fire-fighting &c
- . antitoxins, toxins, toxoids, vaccines, hormones and other medicinally-active bacterial or animal-organ preparations of undefined chemical composition *other than* the purification and isolation of naturally-occurring therapeutic peptides—A5B, Pharmaceutical preparations &c
- . protein antigens (*other than* the purification, isolation or synthesis thereof) stated to be specific for a particular disease and non-protein antigens—A5B, Pharmaceutical preparations &c
- . use and preparations of known peptides as therapeutic agents or artificial sweeteners *not including* purification, isolation or synthesis of peptide—A5B, Pharmaceutical preparations &c; A2B, Food preparations; *respectively*
- . processes for making colloidal solutions of proteins—B1V, Organic dispersions
- . processes for casting or moulding proteins or condensation products thereof—B5A, Moulding plastic substances &c
- . processes for making filaments, films or foils from proteins or condensation products thereof—B5B, Making artificial fibres, films &c
- . purification of slaughterhouse slurries &c—C1C, Treating water, sewage &c
- . antibiotics of unknown constitution produced by fungi and bacteria—C2A, Antibiotics
- . oligonucleic acids (*other than* nucleic acid probes) having less than 10 nucleic acid units—C2P, Organic compounds containing phosphorus
- . cellular products and their preparation—C3C, Cellular polymeric materials
- . mouldable compositions containing proteins or condensation products thereof—C3N, Plastic compositions &c
- . graft polymerisation products based on proteins—C3P, Addition polymers &c
- . synthetic peptides consisting of 10 or more identical amino acid units or random polymers obtained from mixtures of amino acids—C3R, Condensation polymers &c
- . use of novel pigments in the mass pigmentation of proteins &c—C4P, Dyes and pigments
- . adhesive compositions containing only minor proportions of proteins or degradation products thereof—C4X, Miscellaneous compositions and materials
- . methods for obtaining proteinaceous material of undefined chemical composition by microbiological processes—C6F, Microbiology &c
- . mutation of microorganisms by chemical treatment thereof, use of radiation and like processes—C6F, Microbiology &c
- . preparations comprising living (*ie* viable) cells—C6F, Microbiology &c
- . processes for cell fusion—C6F, Microbiology &c

Explanation of heading subject-matter and relationship with other headings—cont

- . processes for dyeing proteins or protein-containing materials—D1B, Dyeing processes &c
- . methods for determination of enzyme activity—G1B, Chemical analysis, testing &c
- . methods of chemical analysis, testing &c using known proteins and/or enzymes and/or nucleic acids—G1B, Chemical analysis &c
- . electrophoretic techniques of general applications—G1N, Electrophysical and electrochemical measurement &c
- . compositions intended for use in photographic silver halide materials—G2C, Photographic radiation-sensitive materials and their processing
- . processes for hardening proteins for use in photographic layers—G2C, Photographic radiation-sensitive materials and their processing

The exclusion references listed in this heading are not exhaustive. Reference should be made to the appropriate general heading/s for processes, materials, elements or devices which may be more widely applicable than can appropriately be classified in this heading

Relationship with the Universal Indexing Schedules (heading U1S)

In addition to recording uses and applications of inventions classified in this heading, U1S is used, subject to its indexing rules, to record significant properties of materials with which this heading is concerned

Operative dates for Key entries

The operative dates of the terms in this heading are:

1. for all terms annotated by a marginal code, that of the Edition corresponding to that code
2. for all other terms, earlier than that of Edition A

Classifying, indexing and searching notes

1. There is no universally accepted definition of the term 'peptide', but for the purposes of this heading the term includes proteins and enzymes within its scope
2. Classification is normally made on the basis of the source, or of the process of production of the particular peptide. It may therefore be necessary to search under more than one classifying term for peptides *per se*
3. Enzymes, although proteins, are treated as a separate entity and the term "protein" used herein denotes non-enzymatic proteins only
4. Peptides of unknown structure are classified according to their production or method of obtention
5. Peptides of known structure are classified according to the method of production; for example, in HA3 if prepared synthetically; in HA5, if isolated from a natural source; and in HB7E or HB7P, if prepared by genetic engineering
6. Terms from Indexing Schedule C are applied with classification terms HA3, HA4, HA5 and HA7 only for peptides which are specifically disclosed. Thus, if the general disclosure relates to a peptide of from 6 to 10 amino acid units, but only heptapeptides and nonapeptides are specifically defined, only H307 and H309 are applied
7. Defined nucleic acid sequences are classified according to their function (*eg* probes, vector control elements) or their expression product
8. Disclosure relating to micro-organisms used in producing proteins &c is recorded by assigning terms from Heading C6Y, Indexing Schedule for micro-organism information. Details of the indexing practice are given in that schedule

Classifying Schedule

- antibiotic peptides; other natural or chemically synthesised peptides characterised by amino acid composition or sequence—
- . antibiotic peptides of unknown, or only partially known, structure—
 - c HA1A . . obtention (*including* isolation and purification thereof) from specified microbial sources
 - c HA1B . . isolation and purification characterised by the process(es) utilised
 - c HA1C . . chemical treatment, irrespective of source and/or process(es) for isolation and purification
 - HA3 . . peptides *other than* antibiotic peptides of unknown, or only partially known, structure—
 - . . synthetic peptides (*including* desamino and descarboxy derivatives and the simple acyl derivatives, esters and amides thereof) and methods of synthesis thereof
 - . . . *See* Indexing Schedule C
 - HA4 . . derivatives of synthetic peptides having at least one characterising moiety which is non-peptidic in character and whose function is other than that of a mere functional blocking group, *including* sequences which contain non- α amino acyl residues
 - . . . *See* Indexing Schedule C
 - HA5 . . peptides of known amino acid sequence obtained from natural sources
 - . . . *See* Indexing Schedule C
 - HA6 . . peptides obtained from natural sources which are characterised by amino acid composition but have indefinite or unknown sequence
 - HA7 . . peptides of known sequence obtained from natural sources, or the synthetic derivatives thereof, having at least one characterising moiety which is non-peptidic in character and whose function is other than that of a mere functional blocking group
 - . . . *See* Indexing Schedule C
- nucleic acids—
- c HB1 . . obtention (*including* the purification and isolation thereof) from specified microbial sources
 - c HB2 . . obtention (*including* the purification and isolation thereof) from sources *other than* microbial
 - c HB3 . . isolation and purification, characterised by process(es) utilised
 - . . processes for the synthesis of nucleic acids (*including* the treatment of naturally-occurring nucleic acids)—
 - m HB4A . . nucleic acid probes
 - m HB4B . . other
 - c HB5 . . chemical treatment and reaction products
 - c HB6 . . compositions comprising nucleic acids (*including* derivatives thereof) of undefined sequence
 - . . genetic manipulation by insertion of specifically-defined DNA and/or RNA into biological cells and materials therefor—
 - . . nucleic acid probes—*See* term HB4A *above*
 - i HB7E . . production of known enzymes by genetically manipulated biological cells
 - . . *See also* Indexing Schedules F1 and G
 - i HB7P . . production of known proteins (*including* peptides) by genetically manipulated biological cells
 - . . *See also* Indexing Schedules F1 and F2
 - i HB7V . . transformation vectors
 - . . *See also* Indexing Schedules F1 and F2
 - i HB7M . . “modified” (or heterogeneous) genes wherein expression results in product which differs from that of natural origin, and derivatives thereof
 - . . *See also* Indexing Schedules F1 and F2
 - j HB7T . . characterised by a change in the phenotype of the host organism (*including* transgenic manipulation)
 - j HB7X . . not otherwise provided for
 - . . production of enzymes or proteins (*including* purification and isolation) by non-genetically manipulated micro-organisms (*other than* from animal cells or plant cells)—
 - HC1 . . enzymes
 - . . *See also* Indexing Schedule G
 - HC2 . . proteins
 - HD . . non-microbiological production of enzymes (*including* purification and isolation from unspecified sources)
 - . . *See also* Indexing Schedule G
 - HN . . treatment of proteins or enzymes or solutions containing them with enzymes
 - HE . . extraction of proteinaceous material from crude sources
 - . . obtention, separation and purification of proteins from non-microbial and non-genetically engineered sources, and their derivatives—
 - HF1 . . by addition of solids or their solutions (*other than* addition for pH control)

Classifying Schedule—*cont*

- i HF2AA . . by passage through or across a bed (*other than* by dialysis or ultrafiltration)—
- i HF2AB . . characterised by the bed having an affinity for the protein &c
- i HF2AC . . characterised by the bed separating molecules according to size
- i HF2AX . . characterised by the bed having an electric potential applied thereto
- f HF4 . . other
- f HF4 . . by dialysis or ultrafiltration
- f HF3 . . by use of organic solvents, either to dissolve the protein or remove impurities therefrom
- f HF5 . . by treatment of animal cells or plant cells (*including* culture techniques, immunisation of animals thereby to obtain polyclonal antibodies, and like processes), but *excluding* monoclonal antibodies
- j HF5A . . of monoclonal antibodies (*including* bispecific and trispecific antibodies)
- i HF6 . . *See also* Indexing Schedule H
- HF6 . . by pH adjustment
- HF7 . . by other methods
- HFZ . . by combination of above methods
- HG . . *See also* Indexing Schedule A
- HG concentration of protein and enzyme solutions
- HH1 non-enzymatic chemical after-treatment of proteins or enzymes *including* association with a carrier—
- HH1 . . antibiotics—*See* term HA1C *above*
- HH1 . . protein and/or enzyme complexed with or absorbed in macromolecular substances wherein said substances are carriers for said protein and/or enzyme (*including* natural and synthetic polymers, glass, clay and like carriers)
- HH1 . . *See also* Indexing Schedule B
- HH2 . . hardening and tanning proteins (*including* resins and undefined condensation products)
- HH2 . . other chemical after-treatment of—
- HHX1 . . enzymes
- HHX1 . . . *See also* Indexing Schedule E
- HHX2 . . proteins
- HHX2 . . . *See also* Indexing Schedule E
- HJ physical treatment of proteins or enzymes
- HK1 protein and/or enzyme compositions characterised by constitution—
- HK1 . . comprising enzyme-enzyme, protein-protein, protein-enzyme, enzyme-amino acid and protein-amino acid mixtures
- HK4 . . other enzyme compositions
- HK2 . . protein compositions characterised by the presence of a functional additive, or a combination of such additives
- HK3 . . other protein compositions
- HP compositions characterised by method of manufacture
- HZ enzyme inhibitors of proteinaceous character
- HL articles and uses characterised solely by the choice of protein, enzyme or peptide
- HM other subjects

Indexing Schedule A

Terms from this schedule are assigned to relevant disclosures classified by term HFZ from the Classifying schedule

- H100 separation and purification of proteins and their derivatives—
- H100 . . by addition of solids or their solutions (*other than* addition for pH control)
- i H106 . . by passage through or across a bed (*other than* by dialysis or ultrafiltration)—
- i H106 . . wherein the bed has an affinity for the protein
- i H107 . . wherein the bed separates molecules according to size
- i H108 . . wherein the bed has an electric potential applied thereto
- i H109 . . other *including* unspecified
- f H115 . . by dialysis or ultrafiltration
- f H120 . . by use of organic solvents, either to dissolve the protein or remove impurities therefrom
- f H125 . . by treatment of animal cells or plant cells (*including* culture techniques, immunisation of animals thereby to obtain antibodies, and like processes)
- i H130 . . by pH adjustment
- i H140 . . by other methods

Indexing Schedule B

Terms from this schedule are assigned to relevant disclosures classified by term HH1 from the Classifying schedule

	type of carrier—
H200	. addition polymer
H201	. condensation polymer
	. natural polymer
H202	. . cellulose (<i>including</i> derivatives thereof)
H203	. . other
H210	. inorganic
H220	protein bonded to carrier (<i>other than</i> enzyme bonded to a protein carrier) whole non-viable cells, or parts thereof, bonded to carrier, the cells being—
e H221	. microbial
e H222	. other
e H223	at least two different proteins bonded to carrier
e H224	at least two different enzymes bonded to carrier
e H225	at least two different non-viable whole cells, or parts thereof, bonded to carrier
e H226	at least one enzyme and at least one protein bonded to carrier
e H227	at least one enzyme and at least one non-viable whole cell, or part thereof, bonded to carrier
e H228	at least one protein and at least one non-viable whole cell, or part thereof, bonded to carrier
	method of association—
H230	. physically adsorbed, encapsulated
	. chemically bonded—
H241	. . direct
H242	. . bonding via a linking agent
H250	. other methods of association

Indexing Schedule C

Terms from this schedule are assigned to relevant disclosures classified by any of terms HA3, HA4, HA5 and HA7 from the Classifying schedule

	number of amino acid residues in the peptide—
H302	. two
H303	. three
H304	. four
H305	. five
H306	. six
H307	. seven
H308	. eight
H309	. nine
H310	. ten
H311	. eleven
H312	. twelve
H313	. thirteen
H314	. fourteen
H315	. fifteen
H316	. sixteen
H317	. seventeen
H318	. eighteen
H319	. nineteen
H320	. twenty
H321	. twenty-one
H322	. twenty-two
H323	. twenty-three
H324	. twenty-four
H325	. twenty-five
H326	. twenty-six to thirty
H331	. thirty-one to thirty-eight
H339	. at least thirty-nine
H350	peptides containing at least one amino acid residue in the D- or DL-configuration peptide chain interrupted by, or having directly attached thereto, a residue which is other than an α -aminoacyl residue—
i H361	. wherein the residue is a saccharide
i H362	. wherein the residue is chromogenic (<i>including</i> fluorescent)
i H363	. wherein the residue is other than above
h H365	cyclic peptides (<i>other than</i> those cyclised by -S-S- bridges)
	method of preparation of peptides—
H370	. solid phase synthesis (<i>eg</i> Merrifield)
H380	. other novel or unusual methods
H390	synthetic insulin, and synthetic derivatives of synthetic insulin and natural insulin

Indexing Schedule E

Terms from this schedule are assigned to relevant disclosure classified by either of terms HHX1 and HHX2 from the Classifying schedule

- reaction—
- e H501 . acylation, alkylation, etherification, esterification and oxyalkylation
 - e H502 . deamination and deamidation
 - . degradation (*including* hydrolysis) with—
 - e H503 . . inorganic acids
 - e H504 . . metal hydroxides and/or metal oxides
 - e H505 . . organic acids and organic bases
 - e H506 . . other (*including* heat treatment and/or use of shear forces)
 - e H507 . halogenation
 - . labelling with—
 - e H508 . . chromophoric (*including* fluorescent and photo-activated) compounds
 - e H509 . . radio-isotopes
 - e H510 . oxidation (*including* bleaching)
 - e H511 . reduction
 - e H512 . . to obtain sulphhydryl groups
 - f H530 . . of proteins (*including* peptides) and/or enzymes with proteins, enzymes and/or amino acids (*other than* wherein the latter is a carrier for the former)
 - . other reaction with—
 - e H513 . . carbohydrates (*including* derivatives thereof)
 - e H514 . . drugs and metabolites thereof (*other than* proteins, enzymes and amino acids but *including* steroids, vitamins, antibiotics and nucleic acids)
 - e H515 . . other isocyanates, isothiocyanates and nitriles
 - . . other organic compounds—
 - e H516 . . . aldehydes and ketones
 - e H517 . . . compounds comprising hydroxyl groups
 - e H518 . . . organic carboxylic acids (*including* functional derivatives thereof)
 - e H519 . . . compounds comprising unsaturated carbon-to-carbon bonds
 - e H520 . . . compounds of nitrogen
 - e H521 amines, amides or imides
 - e H522 . . . compounds of phosphorus
 - e H523 . . . compounds of sulphur
 - e H524 . . . ethers (*including* epoxides)
 - e H525 . . . other compounds
 - . to produce—
 - e H526 . . adsorption compounds, salts and complexes (*other than* with metals or compounds thereof)
 - e H527 . . compounds (*including* adsorption compounds), salts and complexes with metals or compounds thereof
 - e H528 . multiple processes
 - e H529 . other processes

Indexing Schedule F1

Terms from this schedule are assigned to the relevant disclosure classified by the terms HB7E, HB7P, HB7V and HB7M

- vectors characterised by—
- i H641 . having more than one control sequence operative in more than one type of host
- i H642 . having a sequence which codes for excretion of a product from a host
- i H643 . having a high copy number
- i H644 . conferring resistance to toxic substances *other than* as a means of initial selection of transformed host
- i H645 . the capability of at least partial incorporation into the host genome
- j H646 . having metabolite control of expression
- j H647 . having temperature control of expression
- j H648 . having enhanced stability of vector
- j H649 . having enhanced expression of gene product
- . the ability to replicate and/or express in—
 - .. procaryotic hosts—
 - ... *Escherischia*
 - i H650 ... *Bacillus*
 - i H651 ... *Streptomyces*
 - i H652 ... other
 - i H653 . eucaryotic hosts—
 - ... fungi (*including* yeasts)—
 - i H654 ... *Saccharomyces*
 - i H655 ... other, *including* unspecified “yeast”
 - i H656 ... animal cells
 - i H657 ... plant cells
 - i H658 ... other (*including* algae)
 - i H660 linkage nucleic acids

Indexing Schedule F2

Terms from this schedule are assigned to the relevant disclosure classified by the terms HB7M, HB7P and HB7V from the Classifying Schedule

- products obtained or coded for—
- . proteins (*including* peptides)—
- .. fusion proteins are recorded by term H690 *below*; main structural units of such proteins are also recorded using the terms *below*
- .. hormones (*including* precursors and portions thereof)—
 - i H670 ... insulin
 - i H671 ... growth hormones
 - i H672 ... other, *including* factors
 - i H673 . invoking neurological inhibitory or stimulatory response
 - .. involved in the immune response—
 - i H674 ... antigens (*including* proteins for use in vaccines and viral proteins)
 - i H675 ... immunoglobulins
 - i H676 ... complement factors
 - .. wherein response is cell mediated—
 - i H680 ... interferons
 - i H681 ... lymphokines
 - i H682 ... other proteins wherein response is cell mediated
 - i H683 ... other proteins involved in the immune response
 - j H686 . receptor proteins or peptides
 - j H687 . enzyme inhibitors
 - j H688 . storage and structural proteins
 - j H689 . insect debilitating proteins (*eg* crystal protein of *Bacillus thuringiensis*)
 - i H684 . other proteins
 - i H685 . enzymes (*including* precursors thereof)
 - i H690 . fusion proteins

Indexing Schedule G

Terms from this Schedule are assigned to the relevant disclosure classified by the term HB7E, HC1 and HD from the Classifying Schedule

- i H710 . oxidoreductases (EC1) *eg* dehydrogenase, oxidase, peroxidase—
- i H712 . acting on the CH-OH, C=O, CHO, CH-CH groups of donors (EC 1.1, 1.2, 1.3)
- i H714 . acting on the CH-NH₂, CH-NH groups of donors (EC 1.4, 1.5)
- i H716 . acting on other nitrogenous compounds, *including* NADH and NADPH as donors (EC 1.6, 1.7)
- i H718 . acting on sulphur haem or diphenols and related substances as donors (EC 1.8, 1.9, 1.10)
- i H719 . acting on H₂O₂ as acceptor or on H as donor (EC 1.11, 1.12)
- i H719 . other, *including* unspecified oxidoreductases and superoxide dismutases
- i H720 . transferases (EC2)—
- i H722 . transferring “one-carbon groups”, aldehydic, ketonic, alkyl or aryl groups (EC 2.1, 2.2, 2.5)
- i H724 . acyl transferases (EC 2.3)
- i H726 . glycosyl transferases (EC 2.4)
- i H728 . transferring nitrogenous groups or sulphur-containing groups (EC 2.6, 2.8)
- i H729 . transferring phosphorus-containing groups (EC 2.7)
- i H730 . other, *including* unspecified transferases
- i H730 . hydrolases (EC3) *eg* esterase, phosphatase, glycosidase, peptidase—
- i H732 . acting on ester bonds (*including restriction endonucleases*) or an acid anhydrides (EC 3.1, 3.6)
- i H734 . acting on glycosyl compounds (EC 3.2)
- i H736 . acting on peptide bonds (EC 3.4)
- i H738 . acting on non-peptidic C-N bonds or on P-N bonds (EC 3.5, 3.9)
- i H739 . acting on ether bonds, C-C or halide bonds (EC 3.3, 3.7, 3.8)
- i H739 . other, *including* unspecified hydrolases
- i H740 . lyases (EC 4, removal of groups leaving -C=C-, or addition of groups across -C=C-) *eg* decarboxylase, aldolase, dehydratase—
- i H742 . C-C or C-O lyase (EC 4.1, 4.2)
- i H749 . C-N, C-S or C-halide lyase (EC 4.3, 4.4, 4.5)
- i H749 . other, *including* unspecified lyases
- i H750 . isomerases (EC 5)—
- i H752 . racemases, epimerases, cis-trans isomerases (5.1, 5.2)
- i H759 . intramolecular oxidoreductases, transferases or lyases (EC 5.3, 5.4, 5.5)
- i H759 . other, *including* unspecified isomerases
- i H760 . ligases (EC 6, synthetases)—
- i H762 . forming C-O bonds (EC 6.1)
- i H764 . forming C-S bonds (EC 6.2)
- i H766 . forming C-N bonds (EC 6.3)
- i H769 . forming C-C bonds (EC 6.4)
- i H770 . other, *including* unspecified ligases
- i H770 . other, *including* unspecified enzymes, and uncharacterized enzyme mixtures

Indexing Schedule H

Terms from this Schedule are assigned to the relevant disclosure classified by the term HF5A from the Classifying Schedule

- j H801 . antigenic material—
- j H802 . bacterial
- j H803 . viral
- j H804 . fungal
- j H805 . protozoal
- j H805 . enzyme
- j H806 . specified proteinaceous material—
- j H807 . . immunoglobulin
- j H808 . . interferon
- j H809 . . glycoprotein
- j H810 . . hormone *including* steroids
- j H811 . . intercellular mediators *eg* lymphokines, factors
- j H819 . . histocompatibility locus
- j H820 . . other proteinaceous material
- j H821 . blood group indicators *including* complement, CHO antigens
- j H822 . non-proteinaceous material
- j H823 . pharmaceutical material
- j H829 . whole cell
- j H840 . other, *including* unspecified
- j H830 . cancer marker
- j H830 . purification or separation of monoclonal antibodies
- j H850 . methods of preparation—
- j H859 . . Kohler-Milstein
- j H859 . . other