C12Q

MEASURING OR TESTING PROCESSES INVOLVING ENZYMES OR MICRO-ORGANISMS (immunoassay G01N33/53); COMPOSITIONS OR TEST PAPERS THEREFOR; PROCESSES OF PREPARING SUCH COMPOSITIONS; CONDITION RESPONSIVE CONTROL IN MICROBIOLOGICAL OR ENZYMOLOGICAL PROCESSES

Definition statement

This subclass/group covers:

Processes in which there is a direct or indirect qualitative or quantitative measurement or test of a material which contains enzymes or micro-organisms or processes in which a material containing enzymes or micro-organisms is used to perform a qualitative or quantitative measurement or test, e.g. testing for antimicrobial activity or cholesterol, geomicrobiological testing.

In vivo or in vitro or in silico measuring or testing processes involving nucleic acid e.g. nucleic acid hybridisation including PCR (Polymerase Chain Reaction).

Compositions or test papers containing micro-organisms or enzymes which can be used to detect or identify a chemical compound or composition, e.g. paper strips for the testing of blood sugar.

Compositions or test papers distinguished by the use of indicators which can be used to detect or identify the presence of micro-organisms or enzymes.

Processes of making such test compositions.

Processes involving enzymes or micro-organisms in which a process parameter is measured and that or another process parameter is varied in response to such measurement, i.e. condition responsive control.

Relationship between large subject matter areas

Controlling or regulating in general is classified in G05.

In groupes C12M-C12Q or C12S, and within each of these groupes, in the absence of an indication to the contrary, classification is made in the last appropriate place.

The codes of group C12R are only for use as Indexing Codes associated with groupes C12C-C12Q or C12S, so as to provide information concerning the micro-organisms used in the processes classified in these groupes.

References relevant to classification in this group

This subclass/group does not cover:

Measuring or testing apparatus with condition measuring or sensing means, e.g. colony counters	C12M 1/34
Apparatus for condition-responsive control processes	C12M 1/36
Observation of the progress or of the result of processes specified in this group by any of the methods specified in groups G01N 3/00-G01N 29/00	G01N
Immunoassay	G01N 33/53
Immunoassay with enzyme label	G01N 33/535
Immunoassay with the carrier being a biological cell or cell fragment	G01N 33/554
Immunoassay for micro-organisms	G01N 33/569
Immunoassay for venereal diseases	G01N 33/571
Immunoassay for enzymes and isoenzymes	G01N 33/573
Immunoassay for cancer	G01N 33/574
Immunoassay for hepatitis	G01N 33/576

Informative references

Attention is drawn to the following places, which may be of interest for search:

Micro-organisms per se	C12N 1/00
Human, animal or plant cells per se	C12N 5/00
Viruses per se	C12N 7/00
Enzymes per se	C12N 9/00, C12N 11/00
Investigating or analysing materials	G01N

by determining their chemical or physical properties	
Investigating or analysing biological material	G01N 33/48-G01N 33/98
Chemical analysis involving blood sugar, e.g. galactose	G01N 33/66
Chemical analysis involving proteins, peptides and amino acids	G01N 33/68
Chemical analysis involving lipids, e.g. cholesterol	G01N 33/92

Special rules of classification within this group

In this subclass, in absence of an indication to the contrary, classification is made in the last appropriate place.

In this subclass, test media are classified in the appropriate group for the relevant test process.

In this subclass, viruses, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are considered as micro-organisms.

In this group, unless specifically provided for, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae are classified together with micro-organisms. Sub-cellular parts, unless specifically provided for, are classified with the whole cell.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Enzyme	Proteinaceous material which causes a chemical change in a starting material without being consumed in the reaction.
Involving	when used in relation to a substance, includes the testing for the substance as well as employing the substance as a determinant or reactant in a test for a different substance.

Micro-organism	Single-celled organisms such as bacteria, actinomycetales or single-celled fungi, e.g. yeasts; for the purposes of classification, this term also includes viruses, undifferentiated human, animal or plant cells, protozoa, tissues and unicellular algae.
Nucleic acid	comprises nucleic acids as in vitro compounds as well as sub-cellular parts in vivo like chromosome territories within the nucleus, plasmids, gene sequences, genetic information, mutations, polymorphisms such as SNPs, in silico base sequences, aptamers (ligand binding nucleic acids) and ribozymes (catalytic active RNA molecules).

C12Q 1/00

Measuring or testing processes involving enzymes, [N: nucleic acids] or micro-organisms (measuring or testing apparatus with condition measuring or sensing means, e.g. colony counters C12M1/34); Compositions therefor; Processes of preparing such compositions

Definition statement

This subclass/group covers:

Processes in which there is a direct or indirect qualitative or quantitative measurement or test of a material which contains enzymes or micro-organisms or processes in which a material containing enzymes or micro-organisms is used to perform a qualitative or quantitative measurement or test, e.g. testing for antimicrobial activity or cholesterol, geomicrobiological testing.

In vivo or in vitro or in silico measuring or testing processes involving nucleic acid e.g. nucleic acid hybridisation including PCR (Polymerase Chain Reaction). See section range C12Q 1/68 - C12Q 1/708.

Compositions or test papers containing micro-organisms or enzymes which can be used to detect or identify a chemical compound or composition, e.g. paper strips for the testing of blood sugar.

Compositions or test papers distinguished by the use of indicators which can be used to detect or identify the presence of micro-organisms or enzymes.

Processes of making such test compositions.

Processes involving enzymes or micro-organisms in which a process parameter is measured and that or another process parameter is varied in response to such measurement, i.e. condition responsive control.

Relationship between large subject matter areas

Controlling or regulating in general is classified in G05.

In groupes C12M- C12Q or C12S, and within each of these groupes, in the absence of an indication to the contrary, classification is made in the last appropriate place.

References relevant to classification in this group

This subclass/group does not cover:

Measuring or testing apparatus with condition measuring or sensing means, e.g. colony counters	C12M 1/34
Apparatus for condition-responsive control processes	C12M 1/36
Observation of the progress or of the result of processes specified in this group by any of the methods specified in groups	G01N 3/00-G01N 29/00 G01N
Immunoassay	G01N 33/53
Immunoassay with enzyme label	G01N 33/535
Immunoassay with the carrier being a biological cell or cell fragment	G01N 33/554
Immunoassay for micro-organisms	G01N 33/569
Immunoassay for venereal diseases	G01N 33/571
Immunoassay for enzymes and isoenzymes	G01N 33/573
Immunoassay for cancer	G01N 33/574

Informative references

Attention is drawn to the following places, which may be of interest for search:

Micro-organisms per se	C12N 1/00
Human, animal or plant cells per se	C12N 5/00
Viruses per se	C12N 7/00
Enzymes per se	C12N 9/00, C12N 11/00
Investigating or analysing materials by determining their chemical or physical properties	G01N
Investigating or analysing biological material	G01N 33/48-G01N 33/98
Chemical analysis involving blood sugar, e.g. galactose	G01N 33/66
Chemical analysis involving proteins, peptides and amino acids	G01N 33/68
Chemical analysis involving lipids, e.g. cholesterol	G01N 33/92

Special rules of classification within this group

In this group, in absence of an indication to the contrary, classification is made in the last appropriate place.

In this group, test media are classified in the appropriate group for the relevant test process.

In this group, viruses, protozoa, tissues and unicellular algae are considered as micro-organisms.

In this group, unless specifically provided for, protozoa, tissues and unicellular algae are classified together with micro-organisms. Sub-cellular parts, unless specifically provided for, are classified with the whole cell.

Classification in main group C12Q 1/00 and sub-groups C12Q 1/001 - C12Q

1/66 is further refined using Indexing Codes from the range C12Q 2304/00 - C12Q 2337/52. The definitions and scope of these Indexing Codes are self evident. The codes and definitions are listed at the end of this document.

Due to the strong relationship between the range C12Q 1/00 - C12Q 1/66 and the range G01N 33/50 - G01N 33/98, "Chemical analysis of biological material", and the rather broad nature of the definitions some of the C12Q 1/001 - C12Q 1/66 sub-groups, refinement of the classification in this area by allocation of Indexing Codes from the range G01N 2333/00 - G01N 2800/60 is highly recommended.

C12Q 1/001

[N: Enzyme electrodes]

Definition statement

This subclass/group covers:

Enzyme-based Electrochemical sensors where inventive concept lies in the enzyme aspect e.g. enzyme used, how attached to electrode, enzyme mediator involvement, enzyme sensing mechanism/system.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following places, which may be of interest for search and classification:

Apparatus specifically adapted for solid-phase testing in biospecific ligand binding assays or immunological testing/immunoassays	G01N 33/54366
Involving physiochemical end-point determination	G01N 33/54373
Electrodes	G01N 33/5438.

C12Q 1/002

[N: Electrode membranes]

Definition statement

This subclass/group covers:

Enzyme electrodes where inventive concept lies in the use of or construction

of a membrane on or in which an enzyme or multi-enzyme sensing system is attached or entrapped

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Membrane	Any non-conductive porous structure

C12Q 1/003

[N: Functionalisation]

Definition statement

This subclass/group covers:

Inventive concept lies in chemical e.g. silylation or physical e.g. plasma treatment of the electrode membrane to alter/create functional groups for attachment of enzyme. May also include crosslinking or other treatments of membrane polymers. Overlap with G01N 33/54353, G01N 33/5436, G01N 33/54393.

Relationship between large subject matter areas

Chemical functionalisation of solid-phases for ligand attachment for use in biospecific ligand binding assays or immunological testing/immunoassays G01N 33/54353.

With the ligand physically entrapped within the solid phase G01N 33/5436.

Treatment of solid-phases (e.g. coating, irradiation) for the purpose of improving reaction conditions (e.g. reduction of non-specific binding, promotion of specific binding G01N 33/54393.

C12Q 1/004

[N: mediator-assisted]

Definition statement

This subclass/group covers:

Enzyme electrodes where the enzyme or multi-enzyme sensing system requires a mediator e.g. co-factors (NAD/FAD), ferrodoxins.

[N: involving specific analytes or enzymes (including groups of enzymes, e.g. oxydases; C12Q 1/004 takes precedence)]

C12Q 1/005

Definition statement

This subclass/group covers:

Enzyme electrodes directed to analysis of specific molecules or use of specific enzymes. Use of multi-enzyme systems such as oxido-reductase systems may also be classified in C12Q 1/004 if the mediator is of importance.

C12Q 1/006

[N: for glucose]

Definition statement

This subclass/group covers:

Enzyme electrodes specifically designed for the analysis of glucose.

C12Q 1/007

[N: involving isoenzyme profiles (for detection of an individual isoenzyme C12Q1/25 to C12Q1/66)]

Definition statement

This subclass/group covers:

Methods for determining isoenzyme profiles.Overlap with G01N 33/573, G01N 33/5735.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following places, which may be of interest for search and classification :

Biospecific ligand binding assays or immunological testing/immunoassays for isoenzymes	G01N 33/573

C12Q 1/008

[N: for determining co-enzymes or co-factors, e.g. NAD, ATP]

Definition statement

This subclass/group covers:

Methods for detecting, measuring or identifying co-enzymes or co-factors e.g. NAD, ATP involved in enzyme reactions.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following places, which may be of interest for search and classification:

Biospecific ligand binding assays or immunological testing/immunoassays for co-enzymes or co-factors	G01N 33/5735

C12Q 1/02

[N: involving viable micro-organisms]

Definition statement

This subclass/group covers:

Methods or processes for living microorganisms which cannot be classified elsewhere in C12Q 1/00- C12Q 1/66. Includes Total Viable Organism (TVO) testing and electrophysical measurements such as ion channel current.

References relevant to classification in this group

This subclass/group does not cover:

Specific binding assays/Immunoassays for microorganisms are classified in	G01N 33/569 - G01N 33/571
For hepatitis	G01N 33/576

C12Q 1/025

[N: for testing or evaluating the effect of chemical or biological compounds, e.g. drugs, cosmetics (antimicrobial activity C12Q1/18)]

Definition statement

This subclass/group covers:

Methods or processes for testing or evaluating non antimicrobial chemical or biological compounds such as drugs, cosmetics.

C12Q 1/04

Determining presence or kind of micro-organism; Use of selective media for testing antibiotics or bacteriocides; Compositions containing a chemical indicator therefor [N: (C12Q1/6897 takes precedence)]

Definition statement

This subclass/group covers:

Methods or processes (qualitative testing) designed to determine the presence or identity (variety, species, genus or Gram +/-) of a microorganism, including compositions containing an indicator for presence or identity of a microorganism.

C12Q 1/045

[N: Culture media therefor]

Definition statement

This subclass/group covers:

Methods, processes or compositions wherein the inventive concept lies in the composition or content of the culture media e.g. percentage ratio of components, compounds present in medium itself (carbon source, nitrogen source, vitamins etc.)

C12Q 1/06

Quantitative determination

Definition statement

This subclass/group covers:

Methods and processes (quantitative testing) for numerical counting the number of viable microorganisms or viable/non-viable ratio in a sample.

C12Q 1/08

using multifield media

Definition statement

This subclass/group covers:

Methods, processes or compositions involving use of a multifield media (single media permitting identification of multiple results or single item e.g. petri dish comprising more than one medium to allow multiple results) in methods and processes (quantitative testing) for numerical counting the number of viable microorganisms or viable/non-viable ratio in a sample.

C12Q 1/10

Enterobacteria

Definition statement

This subclass/group covers:

Methods, processes or compositions involving quantitative determination of Enterobacteria e.g. Citrobacter, Serratia, Proteus, Providencia, Morganella, Yesinia, Escherichia, Shigella, Salmonella, Klebsiella, Enterobacter, Erwinia, Hafnia.

C12Q 1/12

Nitrate to nitrite reducing bacteria

Definition statement

This subclass/group covers:

Methods, processes or compositions involving quantitative determination of bacteria under nitrate to nitrite reducing conditions. Some bacteria e.g. E.Coli use nitrate under anaerobic growth conditions.

C12Q 1/14

Streptococcus; Staphylococcus

Definition statement

This subclass/group covers:

Methods, processes or compositions involving quantitative determination of Streptococcus or Staphylococcus bacteria.

C12Q 1/16

using radioactive material

Definition statement

This subclass/group covers:

Methods, processes or compositions for detecting presence or kind of microorganism (qualitative testing) designed to determine the presence or

identity (variety, species, genus or Gram +/-) of a microorganism. wherein the inventive concept lies in the use of radioisotopes (e.g. 11C, 13 C, 14C, 2H, 3H, 15N, 35S, 35P).

C12Q 1/18

Testing for antimicrobial activity of a material

Definition statement

This subclass/group covers:

Methods or processes for testing of antimicrobial activity of a compound on living microorganisms.

C12Q 1/20

using multifield media

Definition statement

This subclass/group covers:

Methods, processes or compositions involving the use of a multifield media (single media permitting identification of multiple results or single item e.g. petri dish comprising more than one medium to allow multiple results) in methods or processes for testing of antimicrobial activity of a compound on living microorganisms.

C12Q 1/22

Testing for sterility conditions

Definition statement

This subclass/group covers:

Methods or processes for testing if sterility conditions have been achieved or are being maintained. Examples are labels for food packaging, testing of medical instrument sterilization methods, air or water quality.

Special rules of classification within this group

In the following sub-groups C12Q 1/25 - C12Q 1/66 classification is based on the Enzyme Nomenclature as the IUB internationally agreed method (http://www.chem.qmul.ac.uk/iubmb/enzyme).

C12Q 1/25

involving enzymes not classifiable in groups C12Q1/26 [N: to

C12Q1/66]

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes having unidentifiable EC number and enzymes which cannot be classified elsewhere in C12Q 1/26-C12Q 1/66. Classified under this symbol are methods, processes or compositions involving enzymes classified EC 6.X.X.X. These enzymes are characterised by bond formation C-O (6.1), C-S (6.2), C-N (6.3), C-C (6.4), P-O (.5), N-Met (6.6) and may commonly be known as ligase, synthase, carboxylase, cyclase, chelatase.

C12Q 1/26

involving oxidoreductase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 1.X.X.X oxidoreductases, not comprising as part of the IUB name 'dehydrogenase' (see C12Q 1/32) and which cannot be classified elsewhere in C12Q 1/26-C12Q 1/32. Enzymes are characterised by the catalysis of oxidation/reduction reactions and may comprise as part of their IUB name reductase, oxidase, synthase, dismutase, hydrogenase, oxygenase

C12Q 1/28

involving peroxidase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving peroxidase enzymes classified EC 1.11.1.X including peroxidase enzyme itself (EC 1.11.1.7).

C12Q 1/30

involving catalase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving catalase enzyme, EC 1.11.1.6.

C12Q 1/32

involving dehydrogenase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes having an EC number 1.X.X.X and which contain 'dehydrogenase' in the IUB standard enzyme name.

C12Q 1/34

involving hydrolase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 3.X.X.X hydrolases and which cannot be classified elsewhere in C12Q 1/37-C12Q 1/46. Enzymes are characterised by the catalysis of the addition or removal of a water molecule and may comprise as part of their IUB name hydrolase, lipase, lactonase, nuclease, nucleotidase, NTPase, helicase, amidase, sulfatase, depolymerase, glycosylase and variants e.g. ribonuclease. Methods, processes or compositions involving urease (EC 3.5.1.5) - C12Q 1/58. Methods, processes or compositions involving (phospho)lipase - C12Q 1/61.

C12Q 1/37

involving peptidase or proteinase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 3.4.X.X. The enzymes are classified as acting on peptide bonds and may comprise as part of the IUB name peptidase and variants e.g. dipeptidase, aminopeptidase. Methods, processes or compositions involving clotting factors - C12Q 1/56.

There are many enzymes classified in the area EC 3.4.21.X - 3.4.23.X which retain the 'original' names e.g. trypsin, complement factors, kallikrein, subtilisin, papain, Meprin A, renin.

C12Q 1/40

involving amylase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 3.2.1.X. Enzymes are characterised by hydrolysis of O - and S -glycosyl compounds and may comprise as part of the IUB name (sugar residue)sidase e.g. galactosidase, mannosidase.

There are many enzymes classified in the area EC 3.2.1.X which retain the 'original' names e.g. amylase, lysozyme, lactase.

C12Q 1/42

involving phosphatase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 3.1.3.X. Enzymes are characterised by hydrolysis of phosphoric monoesters and usually comprise as part of the IUB name phosphatase.

C12Q 1/44

involving esterase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 3.1.X.X having as part of the IUB name 'esterase' or variant e.g. diesterase, thioesterase. Enzymes are characterised by acting on ester bonds.

C12Q 1/46

involving cholinesterase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving acetylcholinesterase, EC 3.1.1.7 or cholinesterase EC 3.1.1.8.

C12Q 1/48

involving transferase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 2.X.X.X transferases and which cannot be classified elsewhere in C12Q 1/485-C12Q 1/52. Enzymes are characterised by the transfer of a functional group and may comprise as part of their IUB name kinase, transferase, synthase, phosphorylase and variants e.g. aminotransferase.

C12Q 1/485

[N: involving kinase]

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 2.7.X.X having as part of the IUB name 'kinase' or variant. Enzymes are characterised by the transfer of phosphorus-containing groups.

C12Q 1/50

involving creatine phosphokinase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzyme creatine (phospho)kinase, EC 2.7.3.2.

C12Q 1/52

involving transaminase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 2.6.1.X and may comprise as part of the IUB name 'transaminase'. Enzymes are characterised by the transfer of nitrogenous groups.

C12Q 1/527

involving lyase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 4.X.X.X lyases and may comprise as part of the IUB name lyase, carboxylase, aldolase, hydratase and variants e.g. decarboxylase, dehydratase. Enzymes

are characterised by the catalysis of reactions involving the formation of or addition to a double bond.

C12Q 1/533

involving isomerase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving enzymes classified as EC 5.X.X.X isomerases and may comprise as part of the IUB name racemase, mutase, epimerase, isomerase, tautomerase, synthase and variants e.g. aminomutase. Enzymes are characterised by the catalysis of isomerisation reactions.

Special rules of classification within this group

The sub-groups C12Q 1/54 - C12Q 1/66 are intended to highlight specific subject-matter which might also take an earlier symbol. The sub-groups C12Q 1/54 - C12Q 1/66 take precedence over earlier sub-groups under the Last Place Rule.

C12Q 1/54

involving glucose or galactose

Definition statement

This subclass/group covers:

Methods, processes or compositions involving glucose or galactose where glucose or galactose are the final analyte or subject of the test e.g. diabetes testing, glucose demand for testing presence of microorganisms, Glucose Tolerance Test, use of glucose or galactose in the production of enzymes. Electrochemical glucose sensors where the inventive concept is in an electrode or other sensor structure to specifically enhance glucose determinations are classified in C12Q 1/006.

C12Q 1/56

involving blood clotting factors, e.g. involving thrombin, thromboplastin, fibrinogen

Definition statement

This subclass/group covers:

Methods, processes or compositions involving blood clotting factors e.g. thrombin, fibrinogen, thromboplastin. Includes investigation and/or

identification of compounds which are present in or modulate the clotting pathway.

C12Q 1/58

involving urea or urease

Definition statement

This subclass/group covers:

Methods, processes or compositions involving detection of urea or urease (EC 3.5.1.5). Includes measurement of Biological Nitrogen Demand. Urea electrodes where the inventive concept is in the electrode are classified in C12Q 1/001 - C12Q 1/005. Includes detection of ammonia.

C12Q 1/60

involving cholesterol

Definition statement

This subclass/group covers:

Methods, processes or compositions involving detection of cholesterol or LDL-cholesterol. Cholesterol electrodes where the inventive concept is in the electrode are classified in C12Q 1/005.

Relationship between large subject matter areas

Overlap with G01N 33/92.

C12Q 1/61

involving triglycerides

Definition statement

This subclass/group covers:

Methods, processes or compositions involving detection of triglcerides e.g. as biomarkers for disease, HDL, LDL, CM values or acting as substrate for determination of (phospho)lipase enzymes.

Relationship between large subject matter areas

Overlap with G01N 33/92.

C12Q 1/62

involving uric acid

Definition statement

This subclass/group covers:

Methods, processes or compositions involving detection of uric acid, often using the enzyme uricase (EC 1.7.3.3). Includes detection of uric acid as breakdown product indicative of other analytes e.g. purine bases, nucleotides.

C12Q 1/64

Geomicrobiological testing, e.g. for petroleum

Definition statement

This subclass/group covers:

Methods, processes or compositions involving detection of microbiological degradation or contamination of in-situ hydrocarbon reserves, hydrocarbon reserve prospecting using microorganisms, monitoring of microorganism contamination of liquid hydrocarbon fuels, carbon dioxide sequestering by subterranean microorganism methane production.

C12Q 1/66

involving luciferase

Definition statement

This subclass/group covers:

Methods, processes or compositions involving luciferase (EC 1.13.12.X or EC 1.14.14.3).

Involving nucleic acids

C12Q 1/68

[N: General aspects (not used, see subgroups)]

Definition statement

This subclass/group covers:

All documents which can not be classified in any of the other groups but relate to the enzymatic manipulation of nucleic acids.

Relationship between large subject matter areas

The group C12Q 1/00 relates to enzymes. From C12Q 1/68 onwards, assays and products for analysing or detecting nucleic acids are covered. C12Q 1/70

similarly relates to nucleic acid assays and products for analysing or detecting viruses or bacteriophages.

References relevant to classification in this group

This subclass/group does not cover:

Design and fabrication of microarrays (biochips) wherein the invention resides in the synthesis of polypeptides or polynucleotides; Apparatus and devices for combinatorial chemistry or for making molecular arrays.	B01J 19/0046
Microfuidic systems used for nucleic acid analysis like thermal cyclers (PCR-machines), capillary sequencers	B01L 1/00 - B01L 99/00K
Chemical synthesis or modification of nucleosides, nucleotides or oligonucleotides, (chemically linked to other compounds (fluorescent labels, ...	C07H 21/00 - C07H 21/04
Apparatuses and devices used for the enzymatic analysis of nucleic acids are not classified in	C12Q 1/68 and groups.
Coultier counters	G01N 1/00 -G01N1/ 28MG01N 1/31 - G01N/ 44G01N 3/00 - G01N 13/04 G01N 15/00 - G01N 15/1484 G01N 19/00 - G01N 19/10 G01N 35/00 - G01N 35/1097
Sensors and electronic devices wherein the optical detection is important	G01N 21/00
Sensors and electronic devices involving nucleic acids wherein the electrical detection is important	G01N 27/00 G01N 31/00 G01N 33/00
Bioinformatics	G06F 19/10 - G06F 19/24
Computer systems using nucleic acids	G11C 13/02R3B

Informative references

Attention is drawn to the following places, which may be of interest for search:

Immunization, vaccines	A61K 39/00
Viral antigens in a vaccine	A61K 39/12
Gene therapy	A61K 48/00
Bacterial, fungal, protozoal, vertebrate antigens.	C07K 14/00 - C07K 14/825
Antibodies	C07K 16/00
Undifferentiated human, animal or plant cells	C12N 5/00
Extraction and purification of nucleic acids from biological samples, e.g. pure separation or isolation methods; Conditions, buffers or apparatuses therefore	C12N 15/1003 -C12N 15/1017
Isolating individual clones by screening libraries; making libraries	C12N 15/1034 - C12N 15/1093
Non-coding nucleic acids modulating the expression of genes (e.g. siRNA, miRNA,..); aptamers	C12N 15/11
DNA/RNA encoding protein; preparation by recombinant DNA technology	C12N 15/33-C12N 15/51
Bacterial vectors	C12N 15/70 - C12N 15/73
Vectors for fungal cells	C12N 15/80 - C12N 15/815
Animal vectors and their preparation	C12N 15/85 C12N 15/64
Plant cells	C12N 5/04
Animal cells	C12N 5/06

Cells modified by introduction of foreign genetic material	C12N 5/10
Viruses; Bacteriophages	C12N 7/00
Bacterial, fungal and protozoan enzymes	C12N 9/00
Protein diagnostics and detection	G01N 33/50

Special rules of classification within this group

The classification rules for C12Q 1/68, C12Q 1/70, and subgroups are discussed in the following annexes 1 and 2.

Annex 1:

Use of the following classification schemes:

CPC Classes: C12Q 1/68 - C12Q 1/70

CPC (500) codes: C12Q 2500/00 - C12Q 2565/60

The CPC classes in the range C12Q 1/68 - C12Q 1/70 are divided in method groups and nucleic acid product groups (primers, probes, arrays, and other nucleic acid products) as shown in the tables below:

Method classes:

Symbol	Title
C12Q 1/68	involving nucleic acids
C12Q 1/6802	General aspects
C12Q 1/6804	Nucleic acid analysis utilising immunogens
C12Q 1/6806	Preparing nucleic acids for analysis, e.g. for PCR assay
C12Q 1/6809	Sequence identification involving differential detection
C12Q 1/6811	Selection methods for production or design of target specific

	oligonucleotide or binding molecules
C12Q 1/6813	Hybridisation assays
C12Q 1/6816	characterised by the means of detection
C12Q 1/6818	involving interaction of at least two labels, e.g. resonant energy transfer
C12Q 1/682	Signal amplification
C12Q 1/6823	Release of bound marker
C12Q 1/6825	Nucleic acid detection involving sensors
C12Q 1/6827	for mutation or polymorphism detection
C12Q 1/683	involving restriction enzymes, e.g. RFLP
C12Q 1/6832	Enhancement of hybridisation reaction
C12Q 1/6834	Nucleic acid analysis involving immobilisation; Immobilisation characterised by the carrier or coupling agent
C12Q 1/6837	characterised by the use of probe arrays or probe chips
C12Q 1/6839	Triple helix formation in hybridisation assays
C12Q 1/6841	"In-situ" hybridisation
C12Q 1/6844	Nucleic acid amplification reactions
C12Q 1/6846	Common amplification features
C12Q 1/6848	preventing contamination
C12Q 1/6851	Quantitative amplification

C12Q 1/6853	using modified primers or templates
C12Q 1/6855	Ligating adaptors
C12Q 1/6858	Allele specific amplification
C12Q 1/686	Polymerase Chain Reaction (PCR)
C12Q 1/6862	Ligase Chain Reaction (LCR)
C12Q 1/6865	Promoter based amplification, e.g. NASBA, 3SR, TAS
C12Q 1/6867	Replicase based amplifications, e.g. Q-beta replicase
C12Q 1/6869	Methods for sequencing
C12Q 1/6872	involving mass spectrometry
C12Q 1/6874	involving nucleic acid arrays, e.g. Sequencing By Hybridisation (SBH)
C12Q 1/6897	involving reporter genes operably linked to promoters
C12Q 1/70	involving viruses and Bacteriophages

Nucleic acid product groups:

Symbol	Title
C12Q 1/6876	Hybridisation probes, primers, and other nucleic acid products
C12Q 1/6879	for sex determination
C12Q 1/6881	for tissue and cell typing, e.g. HLA probes
C12Q 1/6883	for diseases caused by alterations of genetic material
C12Q 1/6886	for cancer

C12Q 1/6888	for detection or identification of organisms
C12Q 1/689	for bacteria
C12Q 1/6893	for protozoa
C12Q 1/6895	for plants, fungi, or algae
C12Q 1/701	Specific hybridization probes
C12Q 1/702	for retroviruses
C12Q 1/703	Viruses associated with AIDS
C12Q 1/705	for herpetoviridae, e.g. herpes simplex, varicella zoster
C12Q 1/706	for hepatitis
C12Q 1/707	non-A, non-B Hepatitis, excluding hepatitis D
C12Q 1/708	for papilloma

Depending on which kind of application is being classified (i.e. method or product), different rules for classification apply. In this first Annex 1, only the rules for classifying the method applications are discussed. In Annex 2, the classification rules for product applications and the use of the indexing scheme for non-invention information which applies both to product and method applications are discussed.

1. Rules for classification of method applications

1.1 CPC codes C12Q 2500/00 to M12Q 599/00 are " technical feature" codes and are used in a C-set in combination with an appropriate base class selected from C12Q 1/68 to C12Q 1/70 to define the essential technical features of the invention.

1.2 Use of CPC500 codes is restricted to the C-set format and only in combination with the method classes (see above). This means that the use of CPC500 codes in C-sets where the base class is a analyte/product class (see above) is not allowed.

1.3 During classification, after allocation of an appropriate base class, such as C12Q 1/6827, a CPC500 indexing code describing the essential technical

features of the invention can be added to the base class in a C-set.

1.4 Indexing codes of a C-set must be entered in their full form, e.g. C12Q 2525/191.

1.5 It is important to note that in the C-set, only the essential technical features of the invention are to be represented : only exceptionally more than three " technical feature" codes should make up the C-set.

1.6 All indexing codes from groups C12Q 2500/00 to M12Q 599/00 are to be used in the context literally expressed in the phrase ascribed to the code, i.e. the use of an indexing code is neither restricted by its hierarchical position in a group nor by the definition of the group in which the code is found.1.7 Indexing codes C12Q 2500/00 to M12Q 599/00 should not be used outside a C-set as free CPC codes.

1.8 Examples

A method is described for detecting the presence of a nucleic acid or protein target molecule in a sample which method involves, inter alia, the formation of an active ribozyme and cleavage of an assayable marker dependent on the presence or absence of the target:

CPC: C12Q 1/6823 (methods for detection involving release of bound labels/markers)essential technical feature: C12Q 2521/337 (use of ribozyme)

C-set: C12Q 1/6823; C12Q 2521/337

Retrieval during search: (just a few possibilities)

C12Q 1/6823 S C12Q 2521/337/ECL	(retrieves all C-sets with ribozyme)
C12Q 2521/337/ECL	(retrieves all EC classes where ribozyme is in a C-set)
C12Q 1/6823/EC and C12Q 2521/337/ECL	(retrieves all application having at least the EC class C12Q 1/6823 and the indexing code C12Q 2521/337 in a C-set (not necessarily a C-set with C12Q 1/6823 as a base class))

To facilitate finding of an appropriate code(s), the codes have been arranged within groups arranged in a directory. The codes assigned to the Main groups and to Header groups within the directory are not to be used as indexing codes for the purpose of classification. Main groups and Header groups serve merely as means to assist in the logical retrieval of an appropriate indexing code within the directory.

Annex 2:

Use of the following classification schemes:

CPC (600) codes: C12Q 2600/00 - C12Q 2600/178

CPC non-invention information: C12Q 1/68 - C12Q 1/70

1. CPC codes C12Q 2600/00- C12Q 2600/178:

Symbol	Title
C12Q 2600/00	Oligonucleotides characterized by their use (not used)
C12Q 2600/106	Pharmacogenomics , i.e. genetic variability in individual responses to drugs and drug metabolism
C12Q 2600/112	Disease subtyping / staging /classification
C12Q 2600/118	Prognosis of disease development
C12Q 2600/124	Animal traits , i.e. production traits, including athletic performance or the like
C12Q 2600/13	Plant traits
C12Q 2600/136	Screening for pharmacological compounds
C12Q 2600/142	Toxicological screening, e.g. expression profiles which identify toxicity
C12Q 2600/148	Screening for cosmetic compounds
C12Q 2600/154	Methylation markers
C12Q 2600/156	Polymorphic markers (excluding Methylation markers)
C12Q 2600/158	Expression markers
C12Q 2600/16	Primer sets for multiplex assays

C12Q 2600/166	Oligonucleotides used as internal standards/controls/normalisation probes
C12Q 2600/172	Haplotypes
C12Q 2600/178	miRNA, siRNA or ncRNA

1.1 Rules for classification:

1.1.1 The use of the C12Q600 ICO codes is restricted to the nucleic acid product classes in the range C12Q 1/68 - C12Q 1/70:

Symbol	Title
C12Q 1/6876	Hybridisation probes, primers, and other nucleic acid products
C12Q 1/6879	for sex determination
C12Q 1/6881	for tissue and cell typing, e.g. HLA probes
C12Q 1/6883	for diseases caused by alterations of genetic material
C12Q 1/6886	for cancer
C12Q 1/6888	for detection or identification of organisms
C12Q 1/689	for bacteria
C12Q 1/6893	for protozoa
C12Q 1/6895	for plants, fungi, or algae
C12Q 1/701	Specific hybridization probes
C12Q 1/702	for retroviruses
C12Q 1/703	Viruses associated with AIDS
C12Q 1/705	for herpetoviridae, e.g. herpes

	simplex, varicella zoster
C12Q 1/706	for hepatitis
C12Q 1/707	non-A, non-B Hepatitis, excluding hepatitis D
C12Q 1/708	for papilloma

1.1.2 The C12Q600 CPC codes are given as independent CPC codes and are not used in a C-set

1.1.3 The use of the C12Q600 ICO codes is compulsory. They should be given if the claims and/or examples support a functional use as given by any of the C12Q600 CPC codes shown above.

1.2 Examples

a) An application relates to the identification of the TNF haplotype TNF-1031C/-857C/-863C/-308G and its association with Crohn's Disease. The invention also relates to the identification of the -857C allele. The methods and means for determining these polymorphisms are trivial.

The EC class for this application would be C12Q 1/6883.

The methods for determining these polymorphisms are trivial but adding the code C12Q 2600/156 (polymorphic marker) will aid in retrieving the pertinent information of this application.

In search, the combination of C12Q 1/6883, C12Q 2600/156, and keywords will directly lead to the most relevant documents.

The complete classification should therefore be:

C12Q 1/6883 C12Q 2600/156

2) An application relates to the use of the B1153 gene in testing for an allergic disease. The expression level of this gene is increased in patients with an allergic disease. The methods and means for determining the expression level are trivial.The EC class for this application would be C12Q 1/6883.

The methods for determining the expression level are trivial but adding the code C12Q 2600/158 (expression marker) will aid in retrieving the pertinent information of this application.

In search, the combination of C12Q 1/6883 , C12Q 2600/158, and keywords will directly lead to the most relevant documents.

The complete classification should therefore be:

C12Q 1/6883 C12Q 2600/158

3) An application relates to the use of an SNP for determining if a patient would benefit from an anti-cancer therapy. The methods and means for determining the SNP are trivial.

The EC class for this application would be C12Q 1/6886.

The methods for determining the SNP are trivial but adding the code C12Q 2600/156 (expression marker) will aid in retrieving the pertinent information of this application.

In addition, the application relates to pharmacogenomics. If the application provides support for this claim, the code C12Q 2600/106 is given. If no support is present, only the code for polymorphic marker is given.

The complete classification should therefore be:

C12Q 1/68M6BM12Q600/156

If no support is present

or

C12Q 1/6886

C12Q 2600/106 C12Q 2600/156

If the application provides support for a pharmacogenomics claim.

2. CPC codes C12Q 1/68 to C12Q 1/70: non-invention information (additional information)

Symbol	Title
C12Q 1/68	involving nucleic acids
C12Q 1/6802	General aspects
C12Q 1/6804	Nucleic acid analysis utilising immunogens
C12Q 1/6806	Preparing nucleic acids for analysis, e.g. for PCR assay
C12Q 1/6809	Sequence identification involving differential detection
C12Q 1/6811	Selection methods for production or design of target specific oligonucleotide or binding molecules

C12Q 1/6813	Hybridisation assays
C12Q 1/6816	characterised by the means of detection
C12Q 1/6818	involving interaction of at least two labels, e.g. resonant energy transfer
C12Q 1/682	Signal amplification
C12Q 1/6823	Release of bound marker
C12Q 1/6825	Nucleic acid detection involving sensors
C12Q 1/6827	for mutation or polymorphism detection
C12Q 1/683	involving restriction enzymes, e.g. RFLP
C12Q 1/6832	Enhancement of hybridisation reaction
C12Q 1/6834	Nucleic acid analysis involving immobilisation; Immobilisation characterised by the carrier or coupling agent
C12Q 1/6837	characterised by the use of probe arrays or probe chips
C12Q 1/6839	Triple helix formation in hybridisation assays
C12Q 1/6841	"In-situ" hybridisation
C12Q 1/6844	Nucleic acid amplification reactions
C12Q 1/6846	Common amplification features
C12Q 1/6848	preventing contamination
C12Q 1/6851	Quantitative amplification
C12Q 1/6853	using modified primers or templates

C12Q 1/6855	Ligating adaptors
C12Q 1/6858	Allele specific amplification
C12Q 1/686	Polymerase Chain Reaction (PCR)
C12Q 1/6862	Ligase Chain Reaction (LCR)
C12Q 1/6865	Promoter based amplification, e.g. NASBA, 3SR, TAS
C12Q 1/6867	Replicase based amplifications, e.g. Q-beta replicase
C12Q 1/6869	Methods for sequencing
C12Q 1/6872	involving mass spectrometry
C12Q 1/6874	involving nucleic acid arrays, e.g. Sequencing By Hybridisation (SBH)
C12Q 1/6876	Hybridisation probes, primers, and other nucleic acid products
C12Q 1/6879	for sex determination
C12Q 1/6881	for tissue and cell typing, e.g. HLA probes
C12Q 1/6883	for diseases caused by alterations of genetic material
C12Q 1/6886	for cancer
C12Q 1/6888	for detection or identification of organisms
C12Q 1/689	for bacteria
C12Q 1/6893	for protozoa
C12Q 1/6895	for plants, fungi, or algae
C12Q 1/6897	involving reporter genes operably linked to promoters

C12Q 1/70	involving virus or bacteriphage
C12Q 1/701	Specific hybridization probes
C12Q 1/702	for retroviruses
C12Q 1/703	Viruses associated with AIDS
C12Q 1/705	for herpetoviridae, e.g. herpes simplex, varicella zoster
C12Q 1/706	for hepatitis
C12Q 1/707	non-A, non-B Hepatitis, excluding hepatitis D
C12Q 1/708	for papilloma

2.1 Rules for classification for the non-invention indexing codes:

2.1.1 These codes cannot be used as a component of a C-set. Since the use of these indexing codes is not obligatory, the classifier has discretion as to when and how to use these non-invention information indexing codes.

2. 2 Example of use:

An application relates to oligonucleotide probes used for the species-specific identification of parodontophathogenic bacteria by in situ hybridization. The methods for performing the in situ hybridization are trivial.

The EC class for this application would be C12Q 1/689 for the bacterial detection probes.

The method for determining the in situ hybridization is trivial but adding the code C12Q 1/6841 (pointing towards in situ hybridization) will aid in retrieving additional information for this application.

In search, the combination of C12Q 1/689, C12Q 1/6841, and keywords will directly lead to the most relevant documents.

The complete classification should therefore be:

C12Q 1/689 C12Q 1/6841

C12Q 1/6802

Nucleic acid analysis utilising immunogens

C12Q 1/6804

Definition statement

This subclass/group covers:

All applications where immunological compounds are used in the analysis of nucleic acids. (antibodies specific for single or double stranded DNA) This group also includes these applications where nucleic acid detection is used for analysing or detecting proteins and immunogens. (e.g.. immuno PCR)

References relevant to classification in this group

This subclass/group does not cover:

Antibodies	C07K 16/00
Immunoassays where the invention is in the immunological part of the application and immunoassays as such	G01N 33/50

Informative references

Attention is drawn to the following places, which may be of interest for search:

Immunoassays	G01N 33/50

Special rules of classification within this group

Annex 1

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group the following terms (or expressions) are used with the meaning indicated:

Immunogens	means immunological compounds such as antibodies and antigens

C12Q 1/6806

[N: Preparing nucleic acids for analysis, e.g. for PCR assay (C12Q1/6804 takes precedence)]

Definition statement

This subclass/group covers:

All applications which deal with the preparation/modification of nucleic acids in order to use them or prepare them for subsequent analysis (e.g.. amplification techniques (PCR), hybridisation techniques, sequencing of nucleic acids,...). This group also contains applications dealing with the preservation of DNA or RNA samples.

References relevant to classification in this group

This subclass/group does not cover:

Extracting or separating nucleic acids from biological samples, e.g. pure separation or isolation methods; Conditions, buffers or apparatuses therefore	C12N 15/1003
Extracting or separating nucleic acids from biological samples by means of a solid support carrier, e.g. particles, polymers	C12N 15/1006
Extracting or separating nucleic acids from biological samples by chromatography, e.g. electrophoresis, ion-exchange, reverse phase	C12N 15/101
Extracting or separating nucleic acids from biological samples by using magnetic beads	C12N 15/1013
Extracting or separating nucleic acids from biological samples by filtration, e.g. using filters, frits, membranes	C12N 15/1017

Special rules of classification within this group

Annex 1

C12Q 1/6809

[N: Sequence identification involving differential detection]

Definition statement

This subclass/group covers:

All document where the invention concerns a method for determining differential expression (RNA level) and comparative genomics (genomic DNA level) and improvements to such methods. However, if the methods disclosed by an application are known, these applications are classified as products based on the use of the products identified.

References relevant to classification in this group

This subclass/group does not cover:

The screening and making of libraries (e.g. cDNA libraries)	C12N 15/1072

Special rules of classification within this group

Annex 1.

C12Q 1/6811

[N: Selection methods for production or design of target specific oligonucleotides or binding molecules]

Definition statement

This subclass/group covers:

The design of primers and probes using enzymatic techniques for obtaining them.

References relevant to classification in this group

This subclass/group does not cover:

Bioinformatics for probe design or probe optimisation	G06F 19/20
Isolating an individual clone by screening libraries	C12N 15/1034
Screening libraries presented on the surface of microorganisms, e.g. phage display, E. coli display	C12N 15/1037

Ribosome/Polysome display, e.g. SPERT, ARM	C12N 15/1041
Preparation or screening of libraries displayed on scaffold proteins	C12N 15/1044
SELEX	C12N 15/1048
Gene trapping, e.g. exon-, intron-, IRES-, signal sequence-trap cloning, trap vectors	C12N 15/1051
Protein x Protein interaction, e.g. two hybrid selection	C12N 15/1055
Directional evolution of libraries, e.g. evolution of libraries is achieved by mutagenesis and screening or selection of mixed population of organisms	C12N 15/1058
mRNA-Display, e.g. polypeptide and encoding template are connected covalently]	C12N 15/1062
Preparation or screening of tagged libraries, e.g. tagged microorganisms by STM-mutagenesis, tagged polynucleotides, gene tags	C12N 15/1065
Template (nucleic acid) mediated chemical library synthesis, e.g. chemical and enzymatical DNA-templated organic molecule synthesis, libraries prepared by non ribosomal polypeptide synthesis (NRPS), DNA/RNA-polymerase mediated polypeptide synthesis	C12N 15/1068
Differential gene expression library synthesis, e.g. subtracted libraries, differential screening	C12N 15/1072
By coupling phenotype to genotype, not provided for in other groups of this group	C12N 15/1075
Screening libraries by altering the	C12N 15/1079

phenotype or phenotypic trait of the host (reporter assays C12N 15/1086)	
Preparation or screening gene libraries by chromosomal integration of polynucleotide sequences, HR-, site-specific-recombination, transposons, viral vectors	C12N 15/1082
Preparation or screening of expression libraries, e.g. reporter assays	C12N 15/1086
Design, preparation, screening or analysis of libraries using computer algorithms	C12N 15/1089
General methods of preparing gene libraries, not provided for in other subgroups	C12N 15/1093
Phage display	G01N 33/00
Probe design or optimisation using bioinformatics	G06F 19/20

Special rules of classification within this group

Annex 1.

C12Q 1/6813

[N: Hybridisation assays]

Definition statement

This subclass/group covers:

All applications dealing with hybridisation assays which can not be classified in any of the hybridisation subgroups

Special rules of classification within this group

Annex 1

C12Q 1/6816

[N: characterised by the means of detection (C12Q1/6804 takes precedence)]

Definition statement

This subclass/group covers:

All applications dealing with the detection of hybridisation assays which can not be classified in any of the subgroups: C12Q 1/6818 ,C12Q 1/682,C12Q 1/6823, and C12Q 1/6825.

If the detection depends on the use of immunogens, the application is classified in C12Q 1/6804.

Special rules of classification within this group

Annex 1.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Means of detection	the mechanism used to detect the hybridisation of a nucleic acid probe to its nucleic acid target (e.g. labels, ...)

C12Q 1/6818

[N: involving interaction of at least two labels, e.g. resonant energy transfer]

Definition statement

This subclass/group covers:

all applications dealing with the detection of hybridisation events using the interaction between the labels as principle.

References relevant to classification in this group

This subclass/group does not cover:

the use of this detection principle in non-hybridisation based techniques such as nucleic acid amplification(C12Q 1/6844) or sequencing (C12Q 1/6869) unless the invention resides in an improvement which has general applicability also for hybridisation assays (for instance an improved Taqman probe). In this

case both C12Q 1/6818 and an amplification or sequencing group can be given. In all other cases, the class for either NA amplification or NA sequencing is used in combination with an appropriate technical Indexing Code as explained in Annex1.

Special rules of classification within this group

Annex 1

C12Q 1/682

[N: Signal amplification]

Definition statement

This subclass/group covers:

all applications where the detection signal generated in a hybridisation reaction is amplified (for instance the use of branched probes or rolling circle amplification to amplify the hybridisation signal).

References relevant to classification in this group

This subclass/group does not cover:

amplification of target nucleic acids as such wherein the target amplification results in an increase of signal is not seen as signal amplification. In these cases, the class for either NA amplification or NA sequencing is used in combination with an appropriate technical Indexing Code as explained in Annex1.

electronic signal amplification

Special rules of classification within this group

Annex 1

C12Q 1/6823

[N: Release of bound marker]

Definition statement

This subclass/group covers:

all applications wherein the hybridisation detection depends on the physical separation and subsequent detection of a signalling moiety.

References relevant to classification in this group

This subclass/group does not cover:

the use of this detection principle in non-hybridisation based techniques such as nucleic acid amplification(C12Q 1/6844) or sequencing (C12Q 1/6869) unless the invention resides in an improvement which has general applicability also for hybridisation assays. In this case both C12Q 1/6823 and an amplification or sequencing group can be given. In all other cases, the class for either NA amplification or NA sequencing is used in combination with an appropriate technical Indexing Code as explained in Annex1.

C12Q 1/6825

[N: Nucleic acid detection involving sensors]

Definition statement

This subclass/group covers:

all applications wherein the detection of the hybridisation reaction depends on the electrical or physical properties of the label or of the nucleic acid molecules themselves.

References relevant to classification in this group

This subclass/group does not cover:

Sensors and electronic devices involving nucleic acids wherein the electrical detection is important	G01N 27/00 G01N 31/00 G01N 33/00
Sensors wherein the optical detection is important	G01N 21/00
Sensors and electronic devices involving proteins	G01N 33/543

Special rules of classification within this group

Annex 1.

C12Q 1/6827

[N: for mutation or polymorphism detection]

Definition statement

This subclass/group covers:

all methods dealing with the detection of polymorphisms using an hybridisation assay and which can not be classified in C12Q 1/683. The detection of methylation and splice variants is seen as polymorphism

detection and therefore classified in this group if the detection principle is based on a hybridisation assay.

References relevant to classification in this group

This subclass/group does not cover:

Allele specific amplification	C12Q 1/6858
The detection of polymorphisms using amplification based techniques which are classified in	C12Q 1/6858

Examples of places where the subject matter of this class is covered when specially adapted, used for a particular purpose, or incorporated in a larger system

Sequence identification involving differential detection	C12Q 1/6809

Informative references

Attention is drawn to the following places, which may be of interest for search:

Allele specific amplification	C12Q 1/6858

Special rules of classification within this group

the detection of polymorphisms using amplification based techniques which are classified in C12Q 1/6858. The use of allele specific primer extension is covered by C12Q 1/6858 and not C12Q 1/6827

Annex 1.

C12Q 1/683

[N: Enhancement of hybridisation reaction]

Definition statement

This subclass/group covers:

all applications dealing with the enhancement of the binding between a target and its probe (e.g. use of special buffer components, temperatures, probe modifications, ...)

References relevant to classification in this group

This subclass/group does not cover:

Improving the efficiency of amplification reactions	C12Q 1/6848

Informative references

Attention is drawn to the following places, which may be of interest for search:

Allele specific amplification	C12Q 1/6858
Sequence identification involving differential detection	C12Q 1/6809

Special rules of classification within this group

Annex 1.

C12Q 1/6834

[N: Nucleic acid analysis involving immobilisation; Immobilisation characterised by the carrier or coupling agent]

Definition statement

This subclass/group covers:

All applications dealing with the enzymatic and biochemical coupling of nucleic acids to solid surfaces for the use in low throughput assays and the application of those solid surfaces in the subsequent analysis of a nucleic acid.

References relevant to classification in this group

This subclass/group does not cover:

Design and fabrication of microarrays (biochips) wherein the invention resides in the synthesis of polypeptides or polynucleotides; Apparatus and devices for combinatorial chemistry or for making molecular arrays.	B01J 19/0046

Chemical synthesis or modification of nucleosides, nucleotides or oligonucleotides, (chemically linked to other compounds (fluorescent labels, ...	C07H 21/00 - C07H 21/04

Special rules of classification within this group

Annex 1.

C12Q 1/6837

[N: characterised by the use of probe arrays or probe chips (C12Q1/6874 takes precedence)]

Definition statement

This subclass/group covers:

all nucleic acid analysis methods which depend on the use of probe arrays (biochips, microarray). If the use of the array is in the context of a method which can be classified in another group of the hybridisation based assays (e.g.. C12Q 1/6813), the classifier has to decide based on the relevance of the method to classify the application in either one of these groupes or even to classify the application in both groupes if necessary. However, If the use is for sequencing then the application is only classified in C12Q 1/6874.

References relevant to classification in this group

This subclass/group does not cover:

Design and fabrication of microarrays (biochips) wherein the invention resides in the synthesis of polypeptides or polynucleotides; Apparatus and devices for combinatorial chemistry or for making molecular arrays.	B01J 19/0046
Chemical synthesis or modification of nucleosides, nucleotides or oligonucleotides, (chemically linked to other compounds (fluorescent labels, ...	C07H 21/00 - C07H 21/04

Special rules of classification within this group

Annex 1.

C12Q 1/6839

[N: Triple helix formation in hybridisation assays]

Definition statement

This subclass/group covers:

All methods dealing with the formation of a triple helix DNA conformation. This group also covers other higher order conformations of nucleic acids (quadruplex).

Special rules of classification within this group

Annex 1.

C12Q 1/6841

[N: "In-situ" hybridisation]

Definition statement

This subclass/group covers:

all applications dealing with methods for the analysis of a nucleic acid in a cell or positionally in a chromosome like Fluorescent In Situ Hybridisation (FISH).

Special rules of classification within this group

Annex 1.

C12Q 1/6844

[N: Nucleic acid amplification reactions]

Definition statement

This subclass/group covers:

all amplification methods which do not belong in any of the amplification groupes (C12Q 1/6846-D10). Generally amplification techniques which use a mechanism for amplifying nucleic acids and for which no group exists are classified in C12Q 1/6844. An example of such an amplification technique is strand displacement amplification (SDA).

References relevant to classification in this group

This subclass/group does not cover:

Chemical synthesis of oligonucleotides	C07H 21/00
Microfuidic systems used for nucleic acid analysis like thermal cyclers (PCR-machines), capillary sequencers,...	B01L 1/00 - B01L 99/00K

Special rules of classification within this group

Annex 1.

C12Q 1/6848

[N: preventing contamination]

Definition statement

This subclass/group covers:

methods for preventing contamination in an amplification reaction such as the use of wax barriers, containers, uracil glycosylase, hot start and nested PCR. In addition, all methods relating to increasing the specificity of an amplification reaction are classified in this group. These include the use of modified nucleotides (e.g. in amplification reactions designed for amplifying GC-rich templates), special buffer components, pH, ,reaction conditions, ... If the method is designed for a specific amplification technique like PCR (C12Q 1/686), than it is both classified in the specific amplification group, i.e. C12Q 1/686, and in C12Q 1/6848.

References relevant to classification in this group

This subclass/group does not cover:

Improving the efficiency of hybridisation reactions	C12Q 1/6832

Special rules of classification within this group

Annex 1.

C12Q 1/6851

[N: Quantitative amplification]

Definition statement

This subclass/group covers:

methods for the quantitative amplification of nucleic acids including the use of standards or mathematical models. This group also covers methods (both again enzymatic and mathematical) for determining the amplification efficiency.

References relevant to classification in this group

This subclass/group does not cover:

Quantitation of nucleic acids in array (hybridisation) based formats and in differential expression arrays using mathematical models	G06F 19/20

Informative references

Attention is drawn to the following places, which may be of interest for search:

Quantitation of nucleic acids in array (hybridisation) based formats and in differential expression arrays using mathematical models	G06F 19/20

Special rules of classification within this group

Annex 1.

C12Q 1/6853

[N: using modified primers or templates]

Definition statement

This subclass/group covers:

methods using modified primers or templates.

Special rules of classification within this group

Annex 1.

C12Q 1/6855

[N: Ligating adaptors]

Definition statement

This subclass/group covers:

methods where the primer or the template is modified by the ligation to an adaptor.

Special rules of classification within this group

Annex 1.

C12Q 1/6858

[N: Allele specific amplification]

Definition statement

This subclass/group covers:

all methods dealing with the detection of polymorphisms using an amplification assay. The detection of methylation and splice variants is seen as polymorphism detection and therefore classified in this group if the detection principle is based on an amplification assay. This includes allele specific primer extension (also when only one dNTP or ddNTP is incorporated using a polymerase).

References relevant to classification in this group

This subclass/group does not cover:

Hybridisation based polymorphism detection	C12Q 1/6827
Hybridisation based polymorphism detection involving restriction enzymes	C12Q 1/683
Sequencing	C12Q 1/6869

Special rules of classification within this group

Annex 1.

C12Q 1/686

[N: Polymerase Chain Reaction (PCR)]

Definition statement

This subclass/group covers:

all applications dealing with PCR and modifications/improvements thereof (e.g Taqman, multiplex-PCR,...).

Special rules of classification within this group

Annex 1.

C12Q 1/6862

[N: Ligase Chain Reaction (LCR)]

Definition statement

This subclass/group covers:

all applications dealing with LCR and modifications/improvements thereof.

Special rules of classification within this group

Annex 1.

C12Q 1/6865

[N: Promoter based amplification, e.g. NASBA, 3SR, TAS]

Definition statement

This subclass/group covers:

all applications dealing with promoter based amplification and modifications/improvements thereof.

Special rules of classification within this group

Annex 1.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

NASBA	Nucleic acid sequence based amplification
3SR	selfsustained sequence replication
TAS	transcription-based amplification

	system

C12Q 1/6867

[N: Replicase based amplifications, e.g. Q-beta replicase]

Definition statement

This subclass/group covers:

all applications dealing with replicase based amplifications and modifications/improvements thereof.

Special rules of classification within this group

Annex1.

C12Q 1/6869

[N: Methods for sequencing]

Definition statement

This subclass/group covers:

all nucleic acid sequencing methods which can not be classified in the subgroups for sequencing using mass spectrometry (C12Q 1/6872) and sequencing using solid surfaces (C12Q 1/6874). This group also covers methods for sequencing using nanopores and other sequencing systems based on physical properties of nucleic acids (e.g. Atomic Force Microscopy (AFM)).

References relevant to classification in this group

This subclass/group does not cover:

Microfuidic systems used for nucleic acid analysis like thermal cyclers (PCR-machines), capillary sequencers	B01L 1/00 - B01L 99/00K
Apparatus for sequencing using nanopores or nanochannels	G01N 33/48721
Allele specific primer extension	C12Q 1/6858

Special rules of classification within this group

Annex 1.

C12Q 1/6872

[N: involving mass spectrometry]

Definition statement

This subclass/group covers:

all applications dealing with mass spectrometry based sequencing and modifications/improvements thereof.

Special rules of classification within this group

Annex 1.

C12Q 1/6874

[N: involving nucleic acid arrays, e.g. Sequencing By Hybridisation (SBH)]

Definition statement

This subclass/group covers:

all applications dealing with nucleic acid array based sequencing and modifications/improvements thereof.

Special rules of classification within this group

Annex 1.

C12Q 1/6876

[N: Hybridisation probes]

Definition statement

This subclass/group covers:

all nucleic acid products used in the analysis of nucleic acids (primers, probes, controls, ...) which can not be classified in any of the subgroups C12Q 1/6879 - C12Q 1/6895. If an application relates both to methods and nucleic acid products, than these applications are classified in both the appropriate method and product subgroups.

References relevant to classification in this group

This subclass/group does not cover:

Virus antigen in a vaccine	A61K 39/12
Modified nucleosides, nucleotides	C07H 21/00
Bacterial, fungal and protozoal antigens.	C07K 14/195 - C07K 14/365
Antibodies	C07K 16/00
Virus, Bacteriophages	C12N 7/00
Non-coding nucleic acids modulating the expression of genes (e.g. siRNA, miRNA,..); aptamers	C12N 15/11
Bacterial vectors	C12N 15/70 - C12N 15/73
Vectors for fungal cells	C12N 15/80 - C12N 15/815
Animal vectors and their preparation	C12N 15/85 C12N 15/64
Bacterial, fungal and protozoan enzymes	C12N 9/00
Differential detection	C12Q 1/6809
Polymorphism detection by Hybridisation	C12Q 1/6827
Allele specific amplification	C12Q 1/6858
Probes and primers for the detection of viruses and bacteriophages	C12Q 1/701 -C12Q 1/708

Special rules of classification within this group

Annex 2.

C12Q 1/6883

[N: for diseases caused by alterations of genetic material

Definition statement]

This subclass/group covers:

all nucleic acid based diagnostic products. Those include both products for detecting the alterations (polymorphisms (including methylation and splice variants)) of genetic material and for detecting differential expression of a disease gene. If an application also discloses methods for detecting such polymorphisms or differential expression, the classifier should decide based on the relevance of this method to classify the application also in the appropriate method groupes (e.g. C12Q 1/6827, C12Q 1/683, C12Q 1/68 D2G, C12Q 1/6809).

References relevant to classification in this group

This subclass/group does not cover:

Diagnostic immunoassays	G01N 33/53
Primers and probes for cancer assays	C12Q 1/6886

Informative references

Attention is drawn to the following places, which may be of interest for search:

Diagnostic immunoassays	G01N 33/53

Special rules of classification within this group

Annex 2.

C12Q 1/6886

[N: for cancer]

Definition statement

This subclass/group covers:

all nucleic acid based cancer diagnostic products.

References relevant to classification in this group

This subclass/group does not cover:

Cancer diagnostic immunoassays	G01N 33/53

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cancer diagnostic immunoassays	G01N 33/53

Special rules of classification within this group

Annex 2.

C12Q 1/6897

[N: involving reporter genes operably linked to promoters]

Definition statement

This subclass/group covers:

All methods which use the detection of reporter genes or the activity of specific promoters for screening and nucleic acid analysis.

References relevant to classification in this group

This subclass/group does not cover:

If the screening or the analysis focuses on protein interaction, expression or activity,	G01N 33/5008
Preparation or screening of expression libraries, e.g. reporter assays	C12N 15/1086

Special rules of classification within this group

Annex 1.

C12Q 1/70

[N: involving virus or bacteriophage]

Definition statement

This subclass/group covers:

all methods which are specifically designed for the analysis of viral nucleic

acids or for the analysis of nucleic acids of bacteriophages. Methods which are generally applicable to nucleic acid analysis should also be classified in the relevant C12Q 1/68 subgroup.

References relevant to classification in this group

This subclass/group does not cover:

Virus antigen in a vaccine	A61K 39/12
Virus	C12N 7/00

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/701

[N: Specific hybridization probes]

Definition statement

This subclass/group covers:

all probes and primers for the detection and analysis of viruses and bacteriophages not covered by any of the subgroups C12Q 1/703 to C12Q 1/708.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/702

[N: for retroviruses]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of retroviruses. Methods specifically designed for retroviruses are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/703

[N: Viruses associated with AIDS]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of AIDS associated viruses. Methods specifically designed for AIDS associated viruses are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/705

[N: for herpetoviridae, e.g. herpes simplex, varicella zoster]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of herpetoviridae. Methods specifically designed for herpetoviridae are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/706

[N: for hepatitis]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of hepatitis. Methods specifically designed for hepatitis are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/707

[N: non-A, non-B Hepatitis, excluding hepatitis D]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of non-A, non-B, and non-D hepatitis. Methods specifically designed for non-A, non-B, and non-D hepatitis are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 1/708

[N: for papilloma]

Definition statement

This subclass/group covers:

probes and primers for the detection and analysis of papilloma. Methods specifically designed for papilloma are covered in C12Q 1/70 and C12Q 1/68 if necessary.

Special rules of classification within this group

Annex 1 and 2.

C12Q 3/00

Condition responsive control processes (apparatus therefor C12M1/36; controlling or regulating in general G05)

Definition statement

This subclass/group covers:

Processes involving enzymes or micro-organisms in which a process parameter is measured and that or another process parameter is varied in response to such measurement.