SECTION C — CHEMISTRY; METALLURGY

C12 BIOCHEMISTRY; BEER; SPIRITS; WINE; VINEGAR; MICROBIOLOGY; ENZYMOLOGY; MUTATION OR GENETIC ENGINEERING

C12N **MICROORGANISMS OR ENZYMES; COMPOSITIONS THEREOF** (biocides, pest repellants or attractants, or plant growth regulators containing microorganisms, viruses, microbial fungi, enzymes, fermentates, or substances produced by, or extracted from, microorganisms or animal material A01N 63/00; medicinal preparations A61K; fertilisers C05F)**; PROPAGATING, PRESERVING, OR MAINTAINING MICROORGANISMS; MUTATION OR GENETIC ENGINEERING; CULTURE MEDIA** (microbiological testing media C12Q 1/00) **[3]**

Note(s) [3, 4, 6, 7, 2006.01]

1. Attention is drawn to Notes (1) to (3) following the title of class C12.
2. Biocidal, pest repellant, pest attractant or plant growth regulatory activity of compounds or preparations is further classified in subclass A01P.
3. Therapeutic activity of single-cell proteins or enzymes is further classified in subclass A61P.
4. When classifying in this subclass, classification is also made in group B01D 15/08 insofar as subject matter of general interest relating to chromatography is concerned.
5. In this subclass, it is desirable to add the indexing codes of subclass C12R.

Subclass index

1/00 **Microorganisms, e.g. protozoa; Compositions thereof** (medicinal preparations containing material from protozoa, bacteria or viruses A61K 35/66, from algae A61K 36/02, from fungi A61K 36/06; preparing medicinal bacterial antigen or antibody compositions, e.g. bacterial vaccines, A61K 39/00)**; Processes of propagating, maintaining or preserving microorganisms or compositions thereof; Processes of preparing or isolating a composition containing a microorganism; Culture media therefor [3, 2006.01]**

1/02 • Separating microorganisms from their culture media **[3, 2006.01]**

1/04 • Preserving or maintaining viable microorganisms (immobilised microorganisms C12N 11/00) **[3, 2006.01]**

1/06 • Lysis of microorganisms **[3, 2006.01]**

1/08 • Reducing the nucleic acid content **[3, 2006.01]**

1/10 • Protozoa; Culture media therefor **[3, 2006.01]**

1/11 • • modified by introduction of foreign genetic material **[5, 2006.01]**

1/12 • Unicellular algae; Culture media therefor (as new plants A01H 13/00) **[3, 2006.01]**

1/13 • • modified by introduction of foreign genetic material **[5, 2006.01]**

1/14 • Fungi (culture of mushrooms A01G 1/04; as new plants A01H 15/00); Culture media therefor **[3, 2006.01]**

1/15 • • modified by introduction of foreign genetic material **[5, 2006.01]**

1/16 • • Yeasts; Culture media therefor **[3, 2006.01]**

1/18 • • • Baker's yeast; Brewer's yeast **[3, 2006.01]**

1/19 • • • modified by introduction of foreign genetic material **[5, 2006.01]**

1/20 • Bacteria; Culture media therefor **[3, 2006.01]**

1/21 • • modified by introduction of foreign genetic material **[5, 2006.01]**

1/22 • Processes using, or culture media containing, cellulose or hydrolysates thereof **[3, 2006.01]**

1/24 • Processes using, or culture media containing, waste sulfite liquor **[3, 2006.01]**

1/26 • Processes using, or culture media containing, hydrocarbons (refining of hydrocarbon oils by using microorganisms C10G 32/00) **[3, 2006.01]**

1/28 • • aliphatic **[3, 2006.01]**

1/30 • • • having five or less carbon atoms **[3, 2006.01]**

1/32 • Processes using, or culture media containing, lower alkanols, i.e. C_1 to C_6 **[3, 2006.01]**

1/34 • Processes using foam culture **[3, 2006.01]**

1/36 • Adaptation or attenuation of cells **[3, 2006.01]**

1/38 • Chemical stimulation of growth or activity by addition of chemical compounds which are not essential growth factors; Stimulation of growth by removal of a chemical compound (C12N 1/34 takes precedence) **[3, 2006.01]**

3/00 **Spore-forming or isolating processes [3, 2006.01]**

5/00 **Undifferentiated human, animal or plant cells, e.g. cell lines; Tissues; Cultivation or maintenance thereof; Culture media therefor** (plant reproduction by tissue culture techniques A01H 4/00) **[3, 5, 2006.01]**

5/02 • Propagation of single cells or cells in suspension; Maintenance thereof; Culture media therefor **[3, 2006.01]**

5/04 • Plant cells or tissues **[5, 2006.01]**

5/07 • Animal cells or tissues **[2010.01]**

Note(s) [2010.01]

The last place priority rule does not apply between the subgroups of this group.

5/071 • • Vertebrate cells or tissues, e.g. human cells or tissues **[2010.01]**

5/073 • • • Embryonic cells or tissues; Foetal cells or tissues **[2010.01]**

5/0735 • • • • Embryonic stem cells; Embryonic germ cells **[2010.01]**

5/074 • • • Adult stem cells **[2010.01]**

5/075 • • • Oocytes; Oogonia **[2010.01]**

5/076 • • • Sperm cells; Spermatogonia **[2010.01]**

5/077 • • • Mesenchymal cells, e.g. bone cells, cartilage cells, marrow stromal cells, fat cells or muscle cells **[2010.01]**

5/0775 • • • • Mesenchymal stem cells; Adipose-tissue derived stem cells **[2010.01]**

5/078 • • • Cells from blood or from the immune system **[2010.01]**

5/0781 • • • • B cells; Progenitors thereof **[2010.01]**

5/0783 • • • • T cells; NK cells; Progenitors of T or NK cells **[2010.01]**

5/0784 • • • • Dendritic cells; Progenitors thereof **[2010.01]**

5/0786 • • • • Monocytes; Macrophages **[2010.01]**

5/0787 • • • • Granulocytes, e.g. basophils, eosinophils, neutrophils or mast cells **[2010.01]**

5/0789 • • • • Stem cells; Multipotent progenitor cells **[2010.01]**

5/079 • • • Neural cells **[2010.01]**

5/0793 • • • • Neurons **[2010.01]**

5/0797 • • • • Stem cells; Progenitor cells **[2010.01]**

5/09 • Tumour cells **[2010.01]**

5/095 • • Stem cells; Progenitor cells **[2010.01]**

5/10 • Cells modified by introduction of foreign genetic material, e.g. virus-transformed cells **[5, 2006.01]**

5/12 • • Fused cells, e.g. hybridomas **[5, 2006.01]**

5/14 • • • Plant cells **[5, 2006.01]**

5/16 • • • Animal cells **[5, 2006.01]**

5/18 • • • • Murine cells, e.g. mouse cells **[5, 2006.01]**

5/20 • • • • • one of the fusion partners being a B lymphocyte **[5, 2006.01]**

5/22 • • • Human cells **[5, 2006.01]**

5/24 • • • • one of the fusion partners being a B lymphocyte **[5, 2006.01]**

5/26 • • • Cells resulting from interspecies fusion **[5, 2006.01]**

5/28 • • • • one of the fusion partners being a human cell **[5, 2006.01]**

7/00 **Viruses, e.g. bacteriophages; Compositions thereof; Preparation or purification thereof** (medicinal preparations containing viruses A61K 35/76; preparing medicinal viral antigen or antibody compositions, e.g. virus vaccines, A61K 39/00) **[3, 2006.01]**

7/01 • Viruses, e.g. bacteriophages, modified by introduction of foreign genetic material (vectors C12N 15/00) **[5, 2006.01]**

7/02 • Recovery or purification **[3, 2006.01]**

7/04 • Inactivation or attenuation; Producing viral sub-units **[3, 2006.01]**

7/06 • • by chemical treatment **[3, 2006.01]**

7/08 • • by serial passage of virus **[3, 2006.01]**

9/00 **Enzymes, e.g. ligases (6.); Proenzymes; Compositions thereof** (preparations containing enzymes for cleaning teeth A61K 8/66, A61Q 11/00; medicinal preparations containing enzymes or proenzymes A61K 38/43; enzyme containing detergent compositions C11D)**; Processes for preparing, activating, inhibiting, separating, or purifying enzymes [3, 2006.01]**

Note(s) [3, 5]

In this group:

- proenzymes are classified with the corresponding enzymes;
- enzymes are generally categorised according to the "Nomenclature and Classification of Enzymes" of the International Commission on Enzymes. Where appropriate, this designation appears in the subgroups below in parenthesis.

9/02 • Oxidoreductases (1.), e.g. luciferase **[3, 2006.01]**

9/04 • • acting on CHOH groups as donors, e.g. glucose oxidase, lactate dehydrogenase (1.1) **[3, 2006.01]**

9/06 • • acting on nitrogen containing compounds as donors (1.4, 1.5, 1.7) **[3, 2006.01]**

9/08 • • acting on hydrogen peroxide as acceptor (1.11) **[3, 2006.01]**

9/10 • Transferases (2.) (ribonucleases C12N 9/22) **[3, 2006.01]**

9/12 • • transferring phosphorus containing groups, e.g. kinases (2.7) **[3, 2006.01]**

9/14 • Hydrolases (3.) **[3, 2006.01]**

9/16 • • acting on ester bonds (3.1) **[3, 2006.01]**

9/18 • • • Carboxylic ester hydrolases **[3, 2006.01]**

9/20 • • • • Triglyceride splitting, e.g. by means of lipase **[3, 2006.01]**

9/22 • • • Ribonucleases **[3, 2006.01]**

9/24 • • acting on glycosyl compounds (3.2) **[3, 2006.01]**

9/26 • • • acting on alpha-1, 4-glucosidic bonds, e.g. hyaluronidase, invertase, amylase **[3, 2006.01]**

9/28 • • • • Alpha-amylase from microbial source, e.g. bacterial amylase **[3, 2006.01]**

9/30 • • • • • Fungal source **[3, 2006.01]**

9/32 • • • • Alpha-amylase from plant source **[3, 2006.01]**

9/34 • • • • Glucoamylase **[3, 2006.01]**

9/36 • • • acting on beta-1, 4 bonds between N-acetylmuramic acid and 2-acetylamino 2-deoxy-D-glucose, e.g. lysozyme **[3, 2006.01]**

9/38 • • • acting on beta-galactose-glycoside bonds, e.g. beta-galactosidase **[3, 2006.01]**

9/40 • • • acting on alpha-galactose-glycoside bonds, e.g. alpha-galactosidase **[3, 2006.01]**

9/42 • • • acting on beta-1, 4-glucosidic bonds, e.g. cellulase **[3, 2006.01]**

9/44 • • • acting on alpha-1, 6-glucosidic bonds, e.g. isoamylase, pullulanase **[3, 2006.01]**

9/46 • • • • Dextranase **[3, 2006.01]**

9/48 • • acting on peptide bonds, e.g. thromboplastin, leucine aminopeptidase (3.4) **[3, 2006.01]**

9/50 • • • Proteinases **[3, 2006.01]**
9/52 • • • • derived from bacteria **[3, 2006.01]**
9/54 • • • • • bacteria being Bacillus **[3, 2006.01]**
9/56 • • • • • • Bacillus subtilis or Bacillus licheniformis **[3, 2006.01]**
9/58 • • • • derived from fungi **[3, 2006.01]**
9/60 • • • • • from yeast **[3, 2006.01]**
9/62 • • • • • from Aspergillus **[3, 2006.01]**
9/64 • • • • derived from animal tissue, e.g. rennin **[3, 2006.01]**
9/66 • • • Elastase **[3, 2006.01]**
9/68 • • • Plasmin, i.e. fibrinolysin **[3, 2006.01]**
9/70 • • • Streptokinase **[3, 2006.01]**
9/72 • • • Urokinase **[3, 2006.01]**
9/74 • • • Thrombin **[3, 2006.01]**
9/76 • • • Trypsin; Chymotrypsin **[3, 2006.01]**
9/78 • • acting on carbon to nitrogen bonds other than peptide bonds (3.5) **[3, 2006.01]**
9/80 • • • acting on amide bonds in linear amides **[3, 2006.01]**
9/82 • • • • Asparaginase **[3, 2006.01]**
9/84 • • • • Penicillin amidase **[3, 2006.01]**
9/86 • • • acting on amide bonds in cyclic amides, e.g. penicillinase **[3, 2006.01]**
9/88 • Lyases (4.) **[3, 2006.01]**
9/90 • Isomerases (5.) **[3, 2006.01]**
9/92 • • Glucose isomerase **[3, 2006.01]**
9/94 • Pancreatin **[3, 2006.01]**
9/96 • Stabilising an enzyme by forming an adduct or a composition; Forming enzyme conjugates **[3, 2006.01]**
9/98 • Preparation of granular or free-flowing enzyme compositions (C12N 9/96 takes precedence) **[3, 2006.01]**
9/99 • Enzyme inactivation by chemical treatment **[3, 2006.01]**

11/00 Carrier-bound or immobilised enzymes; Carrier-bound or immobilised microbial cells; Preparation thereof [3, 2006.01]

11/02 • Enzymes or microbial cells being immobilised on or in an organic carrier **[3, 2006.01]**
11/04 • • entrapped within the carrier, e.g. gel, hollow fibre **[3, 2006.01]**
11/06 • • attached to the carrier via a bridging agent **[3, 2006.01]**
11/08 • • the carrier being a synthetic polymer **[3, 2006.01]**
11/10 • • the carrier being a carbohydrate **[3, 2006.01]**
11/12 • • • Cellulose or derivatives thereof **[3, 2006.01]**
11/14 • Enzymes or microbial cells being immobilised on or in an inorganic carrier **[3, 2006.01]**
11/16 • Enzymes or microbial cells being immobilised on or in a biological cell **[3, 2006.01]**
11/18 • Multi-enzyme systems **[3, 2006.01]**

13/00 Treatment of microorganisms or enzymes with electrical or wave energy, e.g. magnetism, sonic waves [3, 2006.01]

15/00 Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification; Use of hosts therefor (mutants or genetically engineered microorganisms C12N 1/00, C12N 5/00, C12N 7/00; new plants A01H; plant reproduction by tissue culture techniques A01H 4/00; new animals A01K 67/00; use of medicinal preparations containing genetic material which is inserted into cells of the living body to treat genetic diseases, gene therapy A61K 48/00; peptides in general C07K) **[3, 5, 6, 2006.01]**

Note(s) [3]

This group covers processes wherein there is a modification of the genetic material which would not normally occur in nature without intervention of man which produce a change in the gene structure which is passed on to succeeding generations.

15/01 • Preparation of mutants without inserting foreign genetic material therein; Screening processes therefor **[5, 2006.01]**
15/02 • Preparation of hybrid cells by fusion of two or more cells, e.g. protoplast fusion **[5, 2006.01]**
15/03 • • Bacteria **[5, 2006.01]**
15/04 • • Fungi **[5, 2006.01]**
15/05 • • Plant cells **[5, 2006.01]**
15/06 • • Animal cells **[5, 2006.01]**
15/07 • • Human cells **[5, 2006.01]**
15/08 • • Cells resulting from interspecies fusion **[5, 2006.01]**
15/09 • Recombinant DNA-technology **[5, 2006.01]**
15/10 • • Processes for the isolation, preparation or purification of DNA or RNA (chemical preparation of DNA or RNA C07H 21/00; preparation of non-structural polynucleotides from microorganisms or with enzymes C12P 19/34) **[5, 2006.01]**
15/11 • • DNA or RNA fragments; Modified forms thereof (DNA or RNA not used in recombinant technology C07H 21/00) **[5, 2006.01]**
15/113 • • • Non-coding nucleic acids modulating the expression of genes, e.g. antisense oligonucleotides **[2010.01]**
15/115 • • • Aptamers, i.e. nucleic acids binding a target molecule specifically and with high affinity without hybridising therewith **[2010.01]**
15/117 • • • Nucleic acids having immunomodulatory properties, e.g. containing CpG-motifs **[2010.01]**
15/12 • • • Genes encoding animal proteins **[5, 2006.01]**
15/13 • • • • Immunoglobulins **[5, 2006.01]**
15/14 • • • • Human serum albumins **[5, 2006.01]**
15/15 • • • • Protease inhibitors, e.g. antithrombin, antitrypsin, hirudin **[5, 2006.01]**
15/16 • • • • Hormones **[5, 2006.01]**
15/17 • • • • • Insulins **[5, 2006.01]**
15/18 • • • • • Growth hormones **[5, 2006.01]**
15/19 • • • • Interferons; Lymphokines; Cytokines **[5, 2006.01]**
15/20 • • • • • Interferons **[5, 2006.01]**
15/21 • • • • • • Alpha-interferons **[5, 2006.01]**
15/22 • • • • • • Beta-interferons **[5, 2006.01]**
15/23 • • • • • • Gamma-interferons **[5, 2006.01]**
15/24 • • • • • Interleukins **[5, 2006.01]**
15/25 • • • • • • Interleukin-1 **[5, 2006.01]**
15/26 • • • • • • Interleukin-2 **[5, 2006.01]**

15/27 • • • • • Colony stimulating factors **[5, 2006.01]**
15/28 • • • • • Tumor necrosis factors **[5, 2006.01]**
15/29 • • • Genes encoding plant proteins, e.g. thaumatin **[5, 2006.01]**
15/30 • • • Genes encoding protozoal proteins, e.g. from Plasmodium, Trypanosoma, Eimeria **[5, 2006.01]**
15/31 • • • Genes encoding microbial proteins, e.g. enterotoxins **[5, 2006.01]**
15/32 • • • • Bacillus crystal proteins **[5, 2006.01]**
15/33 • • • • Genes encoding viral proteins **[5, 2006.01]**
15/34 • • • • • Proteins from DNA viruses **[5, 2006.01]**
15/35 • • • • • • Parvoviridae, e.g. feline panleukopenia virus, human parvovirus **[5, 2006.01]**
15/36 • • • • • • Hepadnaviridae **[5, 2006.01]**
15/37 • • • • • • Papovaviridae, e.g. papillomaviruses, polyomavirus, SV40 **[5, 2006.01]**
15/38 • • • • • • Herpetoviridae, e.g. herpes simplex virus, varicella-zoster virus, Epstein-Barr virus, cytomegalovirus, pseudorabies virus **[5, 2006.01]**
15/39 • • • • • • Poxviridae, e.g. vaccinia virus, variola virus **[5, 2006.01]**
15/40 • • • • • Proteins from RNA viruses, e.g. flaviviruses **[5, 2006.01]**
15/41 • • • • • • Picornaviridae, e.g. rhinovirus, coxsackie viruses, echoviruses, enteroviruses **[5, 2006.01]**
15/42 • • • • • • • Foot-and-mouth disease virus **[5, 2006.01]**
15/43 • • • • • • • Poliovirus **[5, 2006.01]**
15/44 • • • • • • Orthomyxoviridae, e.g. influenza virus **[5, 2006.01]**
15/45 • • • • • • Paramyxoviridae, e.g. measles virus, mumps virus, Newcastle disease virus, canine distemper virus, rinderpest virus, respiratory syncytial viruses **[5, 2006.01]**
15/46 • • • • • • Reoviridae, e.g. rotavirus, bluetongue virus, Colorado tick fever virus **[5, 2006.01]**
15/47 • • • • • • Rhabdoviridae, e.g. rabies viruses, vesicular stomatitis virus **[5, 2006.01]**
15/48 • • • • • • Retroviridae, e.g. bovine leukaemia virus, feline leukaemia virus **[5, 2006.01]**
15/49 • • • • • • • Lentiviridae, e.g. immunodeficiency viruses such as HIV, visna-maedi virus, equine infectious anaemia virus **[5, 2006.01]**
15/50 • • • • • • Coronaviridae, e.g. infectious bronchitis virus, transmissible gastroenteritis virus **[5, 2006.01]**
15/51 • • • • • Hepatitis viruses **[5, 2006.01]**
15/52 • • • Genes encoding for enzymes or proenzymes **[5, 2006.01]**

Note(s) [5]

In this group:
- genes encoding for proenzymes are classified with the corresponding genes encoding enzymes;
- enzymes are generally categorised according to the "Nomenclature and Classification of Enzymes" of the International Commission on Enzymes. Where appropriate, this designation appears in the groups below in parenthesis.

15/53 • • • • Oxidoreductases (1) **[5, 2006.01]**
15/54 • • • • Transferases (2) **[5, 2006.01]**
15/55 • • • • Hydrolases (3) **[5, 2006.01]**
15/56 • • • • • acting on glycosyl compounds (3.2), e.g. amylase, galactosidase, lysozyme **[5, 2006.01]**
15/57 • • • • • acting on peptide bonds (3.4) **[5, 2006.01]**
15/58 • • • • • • Plasminogen activators, e.g. urokinase, TPA **[5, 2006.01]**
15/59 • • • • • • Chymosin **[5, 2006.01]**
15/60 • • • • Lyases (4) **[5, 2006.01]**
15/61 • • • • Isomerases (5) **[5, 2006.01]**
15/62 • • • DNA sequences coding for fusion proteins **[5, 2006.01]**

Note(s) [5]

In this group, the following term is used with the meaning indicated:
- "fusion" means the fusion of two different proteins.

15/63 • • Introduction of foreign genetic material using vectors; Vectors; Use of hosts therefor; Regulation of expression **[5, 2006.01]**
15/64 • • • General methods for preparing the vector, for introducing it into the cell or for selecting the vector-containing host **[5, 2006.01]**
15/65 • • • using markers (enzymes used as markers C12N 15/52) **[5, 2006.01]**
15/66 • • • General methods for inserting a gene into a vector to form a recombinant vector using cleavage and ligation; Use of non-functional linkers or adaptors, e.g. linkers containing the sequence for a restriction endonuclease **[5, 2006.01]**

Note(s) [5]

In this group, the following expression is used with the meaning indicated:
- "non-functional linkers" means DNA sequences which are used to link DNA sequences and which have no known function of structural gene or regulating function.

15/67 • • • General methods for enhancing the expression **[5, 2006.01]**
15/68 • • • • Stabilisation of the vector **[5, 2006.01]**
15/69 • • • • Increasing the copy number of the vector **[5, 2006.01]**
15/70 • • • Vectors or expression systems specially adapted for E. coli **[5, 2006.01]**

Note(s) [5]

1. This group covers the use of E. coli as host.
2. Shuttle vectors also replicating in E. coli are classified according to the other host.

15/71 • • • • Expression systems using regulatory sequences derived from the trp-operon **[5, 2006.01]**
15/72 • • • • Expression systems using regulatory sequences derived from the lac-operon **[5, 2006.01]**
15/73 • • • • Expression systems using phage lambda regulatory sequences **[5, 2006.01]**
15/74 • • • Vectors or expression systems specially adapted for prokaryotic hosts other than E. coli, e.g. Lactobacillus, Micromonospora **[5, 2006.01]**

Note(s) [5]

This group covers the use of prokaryotes as hosts.

15/75 • • • • for Bacillus **[5, 2006.01]**
15/76 • • • • for Actinomyces; for Streptomyces **[5, 2006.01]**
15/77 • • • • for Corynebacterium; for Brevibacterium **[5, 2006.01]**
15/78 • • • • for Pseudomonas **[5, 2006.01]**
15/79 • • • Vectors or expression systems specially adapted for eukaryotic hosts **[5, 2006.01]**

Note(s) [5]

This group covers the use of eukaryotes as hosts.

15/80 • • • • for fungi **[5, 2006.01]**
15/81 • • • • • for yeasts **[5, 2006.01]**
15/82 • • • • for plant cells **[5, 2006.01]**
15/83 • • • • • Viral vectors, e.g. cauliflower mosaic virus **[5, 2006.01]**
15/84 • • • • • Ti-plasmids **[5, 2006.01]**
15/85 • • • • for animal cells **[5, 2006.01]**
15/86 • • • • • Viral vectors **[5, 2006.01]**
15/861 • • • • • • Adenoviral vectors **[7, 2006.01]**
15/863 • • • • • • Poxviral vectors, e.g. vaccinia virus **[7, 2006.01]**
15/864 • • • • • • Parvoviral vectors **[7, 2006.01]**
15/866 • • • • • • Baculoviral vectors **[7, 2006.01]**
15/867 • • • • • • Retroviral vectors **[7, 2006.01]**
15/869 • • • • • • Herpesviral vectors **[7, 2006.01]**
15/87 • • Introduction of foreign genetic material using processes not otherwise provided for, e.g. co-transformation **[5, 2006.01]**
15/873 • • • Techniques for producing new embryos, e.g. nuclear transfer, manipulation of totipotent cells or production of chimeric embryos **[2010.01]**
15/877 • • • • Techniques for producing new mammalian cloned embryos **[2010.01]**
15/88 • • • using microencapsulation, e.g. using liposome vesicle **[5, 2006.01]**
15/89 • • • using microinjection **[5, 2006.01]**
15/90 • • • Stable introduction of foreign DNA into chromosome **[5, 2006.01]**