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Patentability of secuences

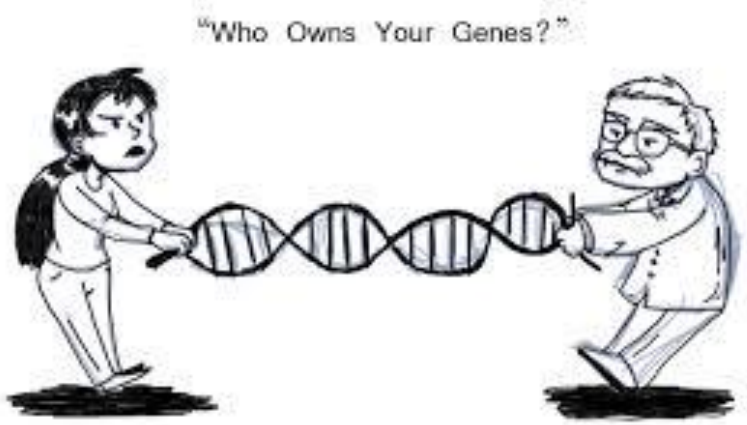
What are Biotechnological Inventions?

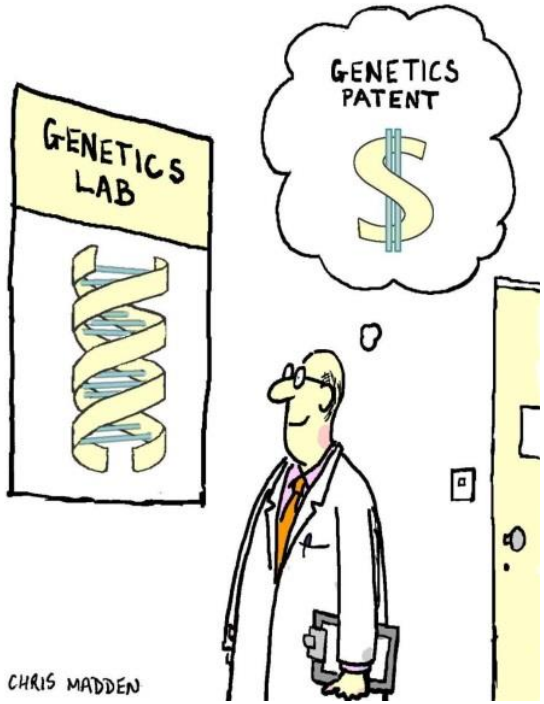
Inventions relating to a product composed of or containing **biological material** or relating to a process for producing, treating or using biological material *.

***Biological matter**" means any material that contains genetic information and is self-reproducible or reproducible in a biological system. This includes living organisms and DNA.

European Patent Convention (EPC), Rule 26 (2), (3)

Patentability of biological sequences: DNA, RNA, amino acids





YES

- Sequences **isolated from a gene** even when its structure is identical to a natural element
- If a gene is claimed **for the first time in any species**, it can be claimed as a product
- If the **biological role** of the sequence **is determined**
- **New application:** when a gene is isolated and functionally described (used for diagnosis)
- If a gene has been previously claimed with a different function, the **new claim must be directed to an use**.

NO

- **Genetic material is found in nature.**
- Sequence with an **unknown or non-specific function**
- **ORF or hypothetical protein**
- **Speculation according to homology** with sequences of known genes or gene products from different organisms

- A nucleic acid molecule that hybridizes to SEQ ID NO: 1. A nucleic acid molecule which is 70% homologous to SEQ ID NO: 1
- Nucleic acid fragment of SEQ ID NO: 1
- Functional analogue of the polypeptide having SEQ ID NO: 2

Indication of the function (s) of the gene (or fragment) or its use at the date of the presentation.

- An **isolated** nucleic acid molecule **encoding a calcium channel C1** characterized in that it consists of SEQ ID NO: 1.

Practical cases. How to claim

Example 1: nucleotide sequences

Corn nucleotide sequences encoding a protein with transglutaminase activity and its use.
MX255368

1. Nucleotide sequence encoding a protein with TGase (transglutaminase) **activity**, **characterized** in that it is selected from the group consisting of:

a) **SEQ ID NO: 1, SEQ ID NO: 3** and a fragment thereof;
b) Nucleotide sequence with a degree of nucleotide identity of at least 60% to any of the sequences defined in a).

Example 2: antisense, siRNA for therapy

Antisense oligonucleotides phosphorothioate **against Smad7** up to 21 nucleotides in length which **comprise** the following sequence (SEQ ID No 2):

5'-GTXYCCCCTTCTCCCXYCAG-3‘

wherein X is a nucleotide comprising a nitrogenous base selected from the group consisting of cytosine, 5-methylcytosine and 2'-O-methylcytosine and wherein Y is a nucleotide comprising a nitrogenous base selected from the group consisting of guanine, 5-methylguanine e 2'-O-methylguanine,

provided that at least one of the nucleotides X or Y comprises a methylated nitrogenous base.

Example 3: cDNA

A cDNA coding for an iron-binding protein derived from a human lactoferrine, **characterized in that** it comprises sequence coding for the amino acid **sequence 74 to 275** of Figure 2.

cDNA is made by the human, not directly isolated from nature = patentable.

*Genetic sequences can be patented alone or in combination with promoters, vectors.

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Amino acid sequences

Functional annotation and industrial application.

- An **isolated** polypeptide which **is a calcium channel C1** characterized in that it consists of SEQ ID NO: 2.

Sequence variants and sequence identity.

Presumed invention: **MPYDSTGHCSELFP**

- D1: MAYDSTGHCSELFP (wt)
- D2: MPYDSTGHCSELFQ
- D3: MAADSTGHCSELFF

Is the matter new?

Presumed invention: **MPYDSTGHCSELFP**

- D1: M**A**YDSTGHCSELFP (wt)
- D2: MPYDSTGHCSELF**Q**
- D3: M**AA**DSTGHCSELF**F**

¡YES!

what is your function?

An isolated polypeptide **having galactanase activity** comprising an amino acid sequence of formula I

NXX(M/L)FDFXGXXLXS (SEQ ID NO: 1)

Wherein said polypeptide has galactanase activity after two hours at **a temperature of 37°C at a pH of 4.5.**

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New hybrid antibiotic peptide and its variants **MX320050**

1. **Technical field:** antimicrobial peptides.

Search for new molecules from natural sources with microbicidal activity.

2. State of the technique:

peptides Hadrurina and vejovina isolated from the venom of scorpions *Hadrurus gertschi* and *Vaejovis mexicanus*

3. Problem: have considerable hemolytic activity

4. Solution: hybrid peptides and synthetic variants derived from the peptides wt

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(A)

Péptidos conocidos	Secuencia	% de identidad
Vejovina	G-IWSSIKNLASKAWNSDIGQSLRNKAAGAINKFVADKIGVTPSQAAS	100
Hadrurina	G-ILKTIKSIASKVANSKTVQKLKRKG---IN-AVANKLGVSP-QAA-	59
Opistoporina2	GKVWDWIKSTAKKLWNSEPVKELKNTALNAAKNFVAEKIGATPS----	50
Opistoporina1	GKVWDWIKSTAKKLWNSEPVKELKNTALNAAKNLVAEKIGATPS----	48
Pandinina1	GKVWDWIKSAAKKIWSSEPVSQLKGQVLNAAKNYVAEKIGATPT----	39
Consenso	G-I---IK--ASK-WNS---Q-LKRKG---IN--VA-KLGV-P-QAA-	

(B)

Nuevos Péptidos	Secuencia	No. aa	Identidad*	Abreviación
Fragmento 1B	GILKT IKSIA SKVAN TVQKL KRKAK NAVA	29	100	F1B
Fragmento 1A	GILKT IKSIA SKVAN TVQKL KRKAK NAV-	28	97	F1A
Fragmento 2A	----- IKSIA SKVAN TVQKL KRKAK NAV-	23	79	F2A
Fragmento 2B	----- IKSIA SKVAN TVQKL KRKAK NAVA	24	83	F2B
Fragmento 3A	----- ---IA SKVAN TVQKL KRKAK NAV-	20	69	F3A
Fragmento 3B	----- ---IA SKVAN TVQKL KRKAK NAVA	21	72	F3B
Fragmento 4A	----- ----- -KVAN TVQKL KRKAK NAV-	17	59	F4A
Fragmento 4B	----- ----- -KVAN TVQKL KRKAK NAVA	18	62	F4B
Fragmento 5A	----- ----- ----- ---KL KRKAK NAV-	10	38	F5A
Fragmento 5B	----- ----- ----- ---KL KRKAK NAVA	11	34	F5B
Secuencia 4	GILKT IKSIA S---- ---KL KRVAK ----	18	59	P18
Secuencia 4m	GILNT IKSIA S---- ---KL KRVAK ----	18	65	P18K3N

1. **A peptide** having **antibiotic activity**, characterized by having an amino acid sequence selected from the group consisting of **SEQ ID NO: 1**; SEQ ID NO: 2; SEQ ID NO: 3; SEQ ID NO: 4; SEQ ID NO: 9 and SEQ ID NO: 10.