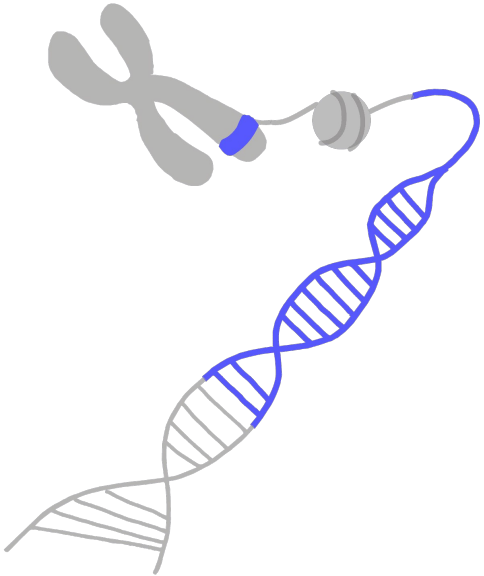
Análisis de la información de los archivos FASTA y GenBank

- Gen CFTR (Cystic Fibrosis Transmembrane Conductance)
- Proteína 4INS (Insulina Humana)



Gen CFTR

- Fundamental en el estudio de la fibrosis quística
- Gen específico

Datos en formato FASTA


```
fasta_seq = SeqIO.read(fasta_file_path, "fasta")
```

```
fasta_info = {
    "ID": fasta_seq.id,
    "Description": fasta_seq.description,
    "Sequence Length": len(fasta_seq.seq),
    "Composition": {
        "A": fasta_seq.seq.count("A"),
        "T": fasta_seq.seq.count("T"),
        "C": fasta_seq.seq.count("C"),
        "G": fasta_seq.seq.count("G")
    }
}
```

- **ID:** 'NM_000492.3',
- **Description:** 'NM_000492.3 Homo sapiens CF transmembrane conductance regulator (CFTR) mRNA'
- **Sequence Length:** 6132
- **Composition:**
  - 'A': 1887
  - 'T': 1731
  - 'C': 1182
  - 'G': 1332

Datos en formato GenBank

```python
genbank_seq = SeqIO.read(genbank_file_path, "genbank")
```

```python
genbank_info = {
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        "C": genbank_seq.seq.count("C"),
        "G": genbank_seq.seq.count("G")
    },
    "Annotations": genbank_seq.annotations,
    "Features": genbank_seq.features,
    "Origin": genbank_seq.seq

}
```

- **Referencias bibliográficas:** referencias científicas con el gen CFTR, de gran relevancia, ej: Reference(title='Domain-interface dynamics of CFTR revealed by stabilizing nanobodies', ...), Reference(title='Unusual Cystic Fibrosis Transmembrane Conductance Regulator Mutations and Liver Disease: A Case Series and Review of the Literature', ...)
- **Comentarios:** basado en RNA-seq, criterios de selección RefSeq.

- **Características generales:** elementos importantes de la secuencia:
  - región del gen
  - PRI
  - posiciones exones
  - 27 agosto 2019
  - regiones de interés
  - sitios regulatorios
  - estructura del gen
- **Accesiones y versión:** Versión 3 de la secuencia que ha sido reemplazada por versión 4
- **Origin:** secuencia de nucleótidos completa del gen
- **Palabras clave:** RefSeq y RefSeq Select (revisada por NCBI)
- **Resumen funcional:** regulación del transporte de iones, relación con mutaciones que causan fibrosis quística
- **Fuente y taxonomía:** Homo sapiens, Vertebrata, Mammalia, Hominidae, Metazoa, Chordata, Craniata, etc.

Proteína 4INS

- Estructura de la insulina de cerdo
- Formada por 2 cadenas A y B
- Cadenas específicas de la proteína de la insulina

Datos en formato FASTA


```
fasta_seq = SeqIO.read(fasta_file_path, "fasta")
```

```
for seq_record in fasta_sequences:
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            "E": seq_record.seq.count("E"),
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            "Q": seq_record.seq.count("Q"),
            "R": seq_record.seq.count("R"),
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            "T": seq_record.seq.count("T"),
            "V": seq_record.seq.count("V"),
            "W": seq_record.seq.count("W"),
            "Y": seq_record.seq.count("Y")
        }
    }
```

- **ID:** pdb|4INS|A,
- **Description:** pdb|4INS|A Chain A, INSULIN (CHAIN A)
- **Sequence Length:** 21
- **Composition:** 'A': 0, 'C': 2, 'D': 0, 'E': 2, 'F': 0, 'G': 3, 'H': 0, 'I': 0, 'K': 0, 'L': 2, 'M': 0, 'N': 2, 'P': 0, 'Q': 2, 'R': 0, 'S': 2, 'T': 1, 'V': 3, 'W': 0, 'Y': 2

Datos en formato GenPept

```
genbank_seq = SeqIO.read(genbank_file_path, "genbank")
```

```
for seq_record in genpept_sequences:
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            "Y": seq_record.seq.count("Y"),
        },
        "Annotations": seq_record.annotations,
        "Features": seq_record.features,
        "Origin": seq_record.seq
    }
```

- **Anotaciones y comentario:**
  - **Palabras clave:** Insulina (estructural)
  - **Comentario:** Estructura cristalina de insulina 2ZN a 1.5 Å de resolución
- **Referencias destacadas:**
  - **Fecha:** 25 octubre 2024
  - **Estructura de la insulina 2ZN:** análisis cristalográfico
  - **Métodos de refinamiento:** evaluación comparativa en modelos atómicos
- **Accesiones y fuente:**
  - **Accesiones:** 4INS_A
  - **Relaciones estructurales:** hexámero de insulina coordinado con zinc
  - **Fuente de datos:** pdb: molecula 4INS, cadena A
- **Features:**
  - **Método experimental:** Difracción de rayos X
  - **Ubicación fuente:** posición 0-21
  - **Organismo:** Sus scrofa (cerdo)
  - **Estructura secundaria:** posiciones 0-9
  - **Enlaces:** posiciones 5-6 y 10-11
- **Origen:**
  - **Taxonomía:** Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Mammalia, Laurasiatheria, Suina, Sus.
  - **Secuencia proteica:** GIVEQCCTSICSLYQLENYCN

INTERPRETACIÓN 2º ENLACE

NIH National Library of Medicine
National Center for Biotechnology Information

Nucleotide [Nucleotide] [ ]
Advanced

GenBank

Arabidopsis thaliana DNA chromosome 4, c

GenBank: AL161505.2
FASTA Graphics

Go to:

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VERSION     AL161505.2
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            Spermatophyta; Magnoliopsida; eudicotyledons; Gunner
            Pentapetalae; rosids; malvids; Brassicales; Brassica
            Camelineae; Arabidopsis.
REFERENCE   1  (bases 1 to 1; 63093 to 175721)
  AUTHORS   Wilson,R., Lamar,B., Stoneking,T., Stumpf,J., Mewes,
            and Mayer,K.F.X.
  JOURNAL   Unpublished
REFERENCE   2  (bases 1 to 198176)
  AUTHORS   EU Arabidopsis sequencing,project.
  TITLE     Direct Submission
  JOURNAL   Submitted (10-MAR-2000) MIPS, at the Max-Planck-Inst
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            lemcke@mips.biochem.mpg.de,mayer@mips.biochem.mpg.de
            Coordinator: Mike Bevan, Molecular Genetics Departme
            Laboratory, John Innes Centre, Colney Lane, NR4 7UJ
            E-mail: michael.bevan@bbsrc.ac.uk
COMMENT     Information on performance of analysis and a more de
            annotation of this entry and other sequences of chro
            and 5 can be viewed at: http://www.mips.biochem.mpg.
            this fragment has an overlap with ATCHRIV16 at the 5
            overlap with ATCHRIV18 at the 3' end.
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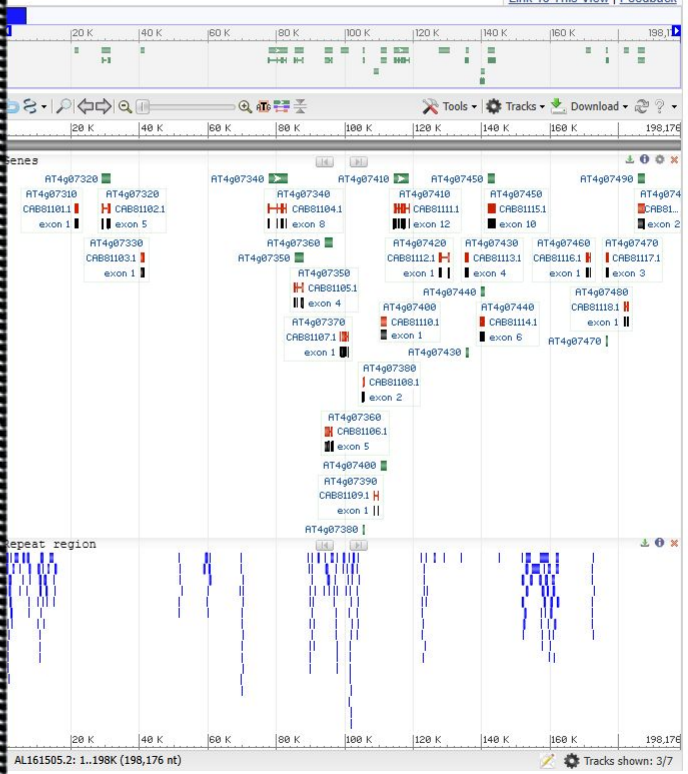
Graphics Send to:

Arabidopsis thaliana DNA chromosome 4, contig fragment No. 17

GenBank: AL161505.2
GenBank FASTA

Link To This View | Feedback



Analyze this sequence
Run BLAST
Pick Primers

Related information
Protein
Taxonomy
Component Of
Full text in PMC
Gene
PubMed (Weighted)
GEO Profiles

Recent activity
Turn Off Clear
Arabidopsis thaliana DNA chromosome 4, contig fra(Nucleotide
1A3N (10) Nucleotide
4INS (5) Protein
Chain A, GREEN FLUORESCENT PROTEIN Protein
1EMA (3) Protein
See more...

INTERPRETACIÓN 1º ENLACE

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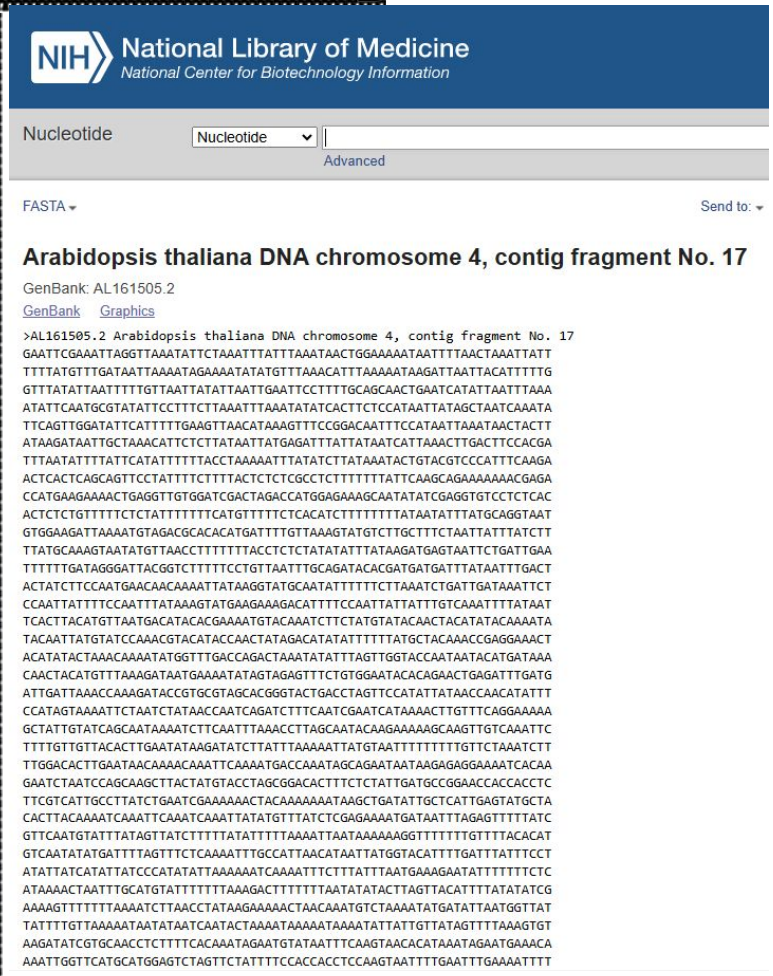

National Library of Medicine
National Center for Biotechnology Information

Nucleotide

Nucleotide

Advanced

FASTA

Send to:

Arabidopsis thaliana DNA chromosome 4, contig fragment No. 17

GenBank: AL161505.2

GenBank Graphics

```
>AL161505.2 Arabidopsis thaliana DNA chromosome 4, contig fragment No. 17
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