

## How to run queries against the database?

As most of the databases in the world, our database uses a special language named SQL (Structured Query Language) to execute queries.

This language allows different operations, but the most common is to retrieve the data. For this purpose SELECT statement is used.

## How SELECT works?

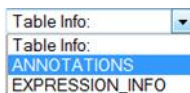
Well, it is quite intuitive once you know the basic things.

First is good to know:

- The name of the table that you want to query.
- The structure of the table (fields, data types...)

Let's start with an example:

- 1) We want to retrieve all the data included in the table: **expression\_info**. The list of tables available is shown in the drop menu Table Info:



- 2) Selecting the option **expression\_info**, a description of the table will appear on the bottom:



A screenshot of a web interface showing the table structure for 'EXPRESSION\_INFO'. The dropdown menu is set to 'EXPRESSION\_INFO'. Below it, a table displays the columns and their data types:

cluster_id	cluster_name	cluster_sequence	EXT	WT	ECTO
int(11)	varchar(30)	text	smallint(6)	smallint(6)	smallint(6)

... and scrolling:



A screenshot of a web interface showing the table structure for 'EXPRESSION\_INFO' after scrolling. The dropdown menu is set to 'EXPRESSION\_INFO'. Below it, a table displays the columns and their data types:

ECTO	ENDO	NANOS	PA	LPS	FLAG
smallint(6)	smallint(6)	smallint(6)	smallint(6)	smallint(6)	smallint(6)

This basically means that:

The table "expression\_info" has 10 fields (columns) with names: cluster\_id, cluster\_name, EXT, WT, ECTO, ENDO, NANOS, PA, LPS and FLAG. It also indicates the type of the data: numeric (int or smallint) or text (varchar, longtext).

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- 3) Now we are going to construct and run our first query (retrieve all the data from a given table).

Just type the following on the query field:

```
SELECT *
FROM expression_info
```

Which it means: Retrieve (*SELECT*) all the fields (\*) *FROM* table named: *expression\_info*.

Write your SQL query here:

```
SELECT *
FROM expression_info
```

Limit Query results to:  rows (0 for no limits).

NOTE: The syntax is case insensitive, so "SELECT" is the same as "select" or "SElecT". The same happens with the column names and symbols.

- 4) Press the button  and a table with the results should appear (If not, check that you have wrote the query correctly):

**SELECT \* FROM EXPRESSION\_INFO limit 1000; (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

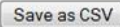
CHARTS: Press  to create quick bar charts. First select the rows using the checkboxes.

SAVE AS CSV: Press  to save the results in CSV format.

Check	cluster_id	cluster_name	cluster_sequence	EXT	WT	ECTO	ENDO	NANOS	PA	LPS	FLAG
<input type="checkbox"/>	1	HAEP_T-CDS_v02_1	TGTTAGAGAGATTGTTGGAT	179	430	3	32	0	27	11	28
<input type="checkbox"/>	2	HAEP_T-CDS_v02_2	ATGTAGCATTATATTGATAA	382	318	1194	15	30	172	38	176
<input type="checkbox"/>	3	HAEP_T-CDS_v02_3	AAGATTACTGAATCTATCC	166	189	3	106	4	30	30	46
<input type="checkbox"/>	4	HAEP_T-CDS_v02_4	GTCATATATAGCATACTC	7	6	1	3	1	0	0	0
<input type="checkbox"/>	5	HAEP_T-CDS_v02_5	TGGTAAGCTAGCAGTTGC	62	27	33	10	51	7	3	5
<input type="checkbox"/>	6	HAEP_T-CDS_v02_6	CCACAATCGTAAGCTACG	0	3	0	0	0	0	0	2
<input type="checkbox"/>	7	HAEP_T-CDS_v02_7	AAAAACGGTGCCAAGAGTAA	171	1368	20	22	16	99	93	67
<input type="checkbox"/>	8	HAEP_T-CDS_v02_8	TGTGAAAGATTGAGTATGA	1	7	0	0	0	0	0	0
<input type="checkbox"/>	9	HAEP_T-CDS_v02_9	TTAAACCTAAAATCTCATCG	4	9	0	0	0	0	0	0
<input type="checkbox"/>	10	HAEP_T-CDS_v02_10	GAAGTTTTATGTCAGGAAK	1243	1269	1873	31	103	262	116	292
<input type="checkbox"/>	11	HAEP_T-CDS_v02_11	GTCATCTACTGTAATGGAGI	28	66	21	1	2	5	1	9
<input type="checkbox"/>	12	HAEP_T-CDS_v02_12	AATAAAGTGGATTCTAAAGC	555	1281	59	41	36	69	63	105
<input type="checkbox"/>	13	HAEP_T-CDS_v02_13	CAACTCTTATGAAGCACTT	26	27	16	2	5	10	5	9
<input type="checkbox"/>	14	HAEP_T-CDS_v02_14	AGGCAGCAATGTCGAAAGT	20	11	0	1	0	0	0	0

IMPORTANT: The results are limited to 1000 rows by default. Depending of the query, the results can be very large and memory consuming.

## Saving results as CSV

In order to export the result to a file, the button  can be used. This will save the results and the filters applied on the table in a CSV file that one can download to the computer and open in Ms Excel, for example.

## Hiding Columns

**Question:** How can I retrieve only data from columns ECTO and NANOS, for example?

**Answer:** Just change the \* for the field names separated by commas (,).

```
SELECT ECTO,NANOS
FROM expression_info
```

**SELECT ECTO,NANOS FROM expression\_info (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	ECTO	NANOS
<input type="checkbox"/>	3	0
<input type="checkbox"/>	1194	30
<input type="checkbox"/>	3	4
<input type="checkbox"/>	1	1
<input type="checkbox"/>	33	51
<input type="checkbox"/>	0	0
<input type="checkbox"/>	20	16
<input type="checkbox"/>	0	0
<input type="checkbox"/>	0	0
<input type="checkbox"/>	1873	103
<input type="checkbox"/>	21	2
<input type="checkbox"/>	59	36

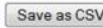
But, where are the references for these values?

Ok, normally you also need to show the ID or the name. Just add them:

```
SELECT cluster_id,cluster_name,ECTO,NANOS
FROM expression_info
```

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO	NANOS
<input type="checkbox"/>	1	HAEP_T-CDS_v02_1	3	0
<input type="checkbox"/>	2	HAEP_T-CDS_v02_2	1194	30
<input type="checkbox"/>	3	HAEP_T-CDS_v02_3	3	4
<input type="checkbox"/>	4	HAEP_T-CDS_v02_4	1	1
<input type="checkbox"/>	5	HAEP_T-CDS_v02_5	33	51
<input type="checkbox"/>	6	HAEP_T-CDS_v02_6	0	0
<input type="checkbox"/>	7	HAEP_T-CDS_v02_7	20	16
<input type="checkbox"/>	8	HAEP_T-CDS_v02_8	0	0
<input type="checkbox"/>	9	HAEP_T-CDS_v02_9	0	0
<input type="checkbox"/>	10	HAEP_T-CDS_v02_10	1873	103
<input type="checkbox"/>	11	HAEP_T-CDS_v02_11	21	2
<input type="checkbox"/>	12	HAEP_T-CDS_v02_12	59	36
<input type="checkbox"/>	13	HAEP_T-CDS_v02_13	16	5

## Ordering Data

**Question:** How do I order the data ascendant or descendant?

**Answer:** There are two possibilities:

- 1) Click on the column's header. This will order the values of this column ascendant or descendant alternatively.

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO	NANOS
<input type="checkbox"/>	6	HAEP_T-CDS_v02_6	0	0
<input type="checkbox"/>	8	HAEP_T-CDS_v02_8	0	0
<input type="checkbox"/>	9	HAEP_T-CDS_v02_9	0	0
<input type="checkbox"/>	14	HAEP_T-CDS_v02_14	0	0
<input type="checkbox"/>	17	HAEP_T-CDS_v02_17	0	3
<input type="checkbox"/>	18	HAEP_T-CDS_v02_18	0	2
<input type="checkbox"/>	19	HAEP_T-CDS_v02_19	0	0
<input type="checkbox"/>	25	HAEP_T-CDS_v02_25	0	0
<input type="checkbox"/>	45	HAEP_T-CDS_v02_45	0	0
<input type="checkbox"/>	59	HAEP_T-CDS_v02_59	0	2
<input type="checkbox"/>	69	HAEP_T-CDS_v02_69	0	0
<input type="checkbox"/>	75	HAEP_T-CDS_v02_75	0	2
<input type="checkbox"/>	77	HAEP_T-CDS_v02_77	0	0
<input type="checkbox"/>	78	HAEP_T-CDS_v02_78	0	9

- 2) Use the clause ORDER BY in your query. Use ASC or DESC to indicate the order.

```
SELECT cluster_id,cluster_name,ECTO,NANOS
FROM expression_info
ORDER BY ECTO DESC
```

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info ORDER BY ECTO DESC (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO	NANOS
<input type="checkbox"/>	4171	HAEP_T-CDS_v02_4171	3046	212
<input type="checkbox"/>	10	HAEP_T-CDS_v02_10	1873	103
<input type="checkbox"/>	5863	HAEP_T-CDS_v02_5863	1836	20
<input type="checkbox"/>	1038	HAEP_T-CDS_v02_1038	1470	2174
<input type="checkbox"/>	4499	HAEP_T-CDS_v02_4499	1410	15
<input type="checkbox"/>	4511	HAEP_T-CDS_v02_4511	1245	130
<input type="checkbox"/>	4402	HAEP_T-CDS_v02_4402	1204	72
<input type="checkbox"/>	2	HAEP_T-CDS_v02_2	1194	30
<input type="checkbox"/>	51	HAEP_T-CDS_v02_51	1193	1254
<input type="checkbox"/>	604	HAEP_T-CDS_v02_604	1161	475
<input type="checkbox"/>	4289	HAEP_T-CDS_v02_4289	1074	33
<input type="checkbox"/>	4791	HAEP_T-CDS_v02_4791	1050	377
<input type="checkbox"/>	1815	HAEP_T-CDS_v02_1815	1046	110
<input type="checkbox"/>	4955	HAEP_T-CDS_v02_4955	1042	41

## Filtering Data

**Question:** How do I filter the data?

**Answer:** There are two possibilities:

- 1) Use the filter fields on the column header (text or numeric data):

For numeric values the following operators are available:

- equal to = N
- greater than > N
- lesser than < N
- lesser or equal <= N
- greater or equal >= N
- range of values N1 .. N2

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO <sup>^</sup>	NANOS
<input type="checkbox"/>			>100	<20
<input type="checkbox"/>	83	HAEP_T-CDS_v02_83	312	13
<input type="checkbox"/>	102	HAEP_T-CDS_v02_102	239	2
<input type="checkbox"/>	113	HAEP_T-CDS_v02_113	200	8
<input type="checkbox"/>	168	HAEP_T-CDS_v02_168	782	7
<input type="checkbox"/>	532	HAEP_T-CDS_v02_532	136	7

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info (1000 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO <sup>^</sup>	NANOS
<input type="checkbox"/>			>100	0 .. 20
<input type="checkbox"/>	83	HAEP_T-CDS_v02_83	312	13
<input type="checkbox"/>	102	HAEP_T-CDS_v02_102	239	2
<input type="checkbox"/>	113	HAEP_T-CDS_v02_113	200	8
<input type="checkbox"/>	168	HAEP_T-CDS_v02_168	782	7
<input type="checkbox"/>	532	HAEP_T-CDS_v02_532	136	7

- 2) Use the clause WHERE and then the condition of your filter (it allows more complex filters):

```
SELECT cluster_id,cluster_name,ECTO,NANOS
FROM expression_info
WHERE ECTO>400
```

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info WHERE ECTO>400 (136 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO	NANOS
<input type="checkbox"/>	2	HAEP_T-CDS_v02_2	1194	30
<input type="checkbox"/>	10	HAEP_T-CDS_v02_10	1373	103
<input type="checkbox"/>	23	HAEP_T-CDS_v02_23	487	357
<input type="checkbox"/>	26	HAEP_T-CDS_v02_26	723	840
<input type="checkbox"/>	27	HAEP_T-CDS_v02_27	625	106
<input type="checkbox"/>	32	HAEP_T-CDS_v02_32	765	55
<input type="checkbox"/>	51	HAEP_T-CDS_v02_51	1193	1254
<input type="checkbox"/>	65	HAEP_T-CDS_v02_65	726	21
<input type="checkbox"/>	72	HAEP_T-CDS_v02_72	652	1320
<input type="checkbox"/>	128	HAEP_T-CDS_v02_128	413	48
<input type="checkbox"/>	131	HAEP_T-CDS_v02_131	483	43

Example with arithmetical and logical operations:

```
SELECT cluster_id,cluster_name,ECTO,NANOS
FROM expression_info
WHERE NANOS/ECTO>100
```

---

**SELECT cluster\_id,cluster\_name,ECTO,NANOS FROM expression\_info WHERE NANOS/ECTO>100 (2 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	ECTO	NANOS
<input type="checkbox"/>	19537	HAEP_T-CDS_v02_19537	2	260
<input type="checkbox"/>	43863	HAEP_T-CDS_v02_43863	1	111

```
SELECT cluster_id,cluster_name,WT,EXT,ECTO,NANOS
FROM expression_info
WHERE NANOS/ECTO>100 AND WT+EXT>200
```

---

**SELECT CLUSTER\_ID,CLUSTER\_NAME,WT,EXT,ECTO,NANOS FROM EXPRESSION\_INFO WHERE NANOS/ECTO>100 AND WT+EXT>200 limit 1000; (1 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	WT	EXT	ECTO	NANOS
<input type="checkbox"/>	19537	HAEP_T-CDS_v02_19537	109	283	2	260

Adding an ORDER BY:

```
SELECT cluster_id,cluster_name,WT,EXT,ECTO,NANOS
FROM expression_info
WHERE NANOS/ECTO>100 AND WT+EXT>100
ORDER BY NANOS DESC
```

---

**SELECT CLUSTER\_ID,CLUSTER\_NAME,WT,EXT,ECTO,NANOS FROM EXPRESSION\_INFO WHERE NANOS/ECTO>100 AND WT+EXT>100 ORDER BY NANOS DESC limit 1000; (2 results)**

FILTERS: An additional filter field is available under the column name. Operators: = , > , < , >= , <= or a range (N1 .. N2) can be used in numeric columns.

SAVE AS CSV: Press  to save the results in CSV format.

Check	CLUSTER_ID	CLUSTER_NAME	WT	EXT	ECTO	NANOS
<input type="checkbox"/>	19537	HAEP_T-CDS_v02_19537	109	283	2	260
<input type="checkbox"/>	43863	HAEP_T-CDS_v02_43863	63	67	1	111

There is more info and examples at: [http://www.w3schools.com/sql/sql\\_select.asp](http://www.w3schools.com/sql/sql_select.asp). In the same page one can also find help and examples for other statements like WHERE or ORDER BY.