

# Análise de Expressão Diferencial

## Tratamento dos resultados - Excel

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# Roteiro de análise

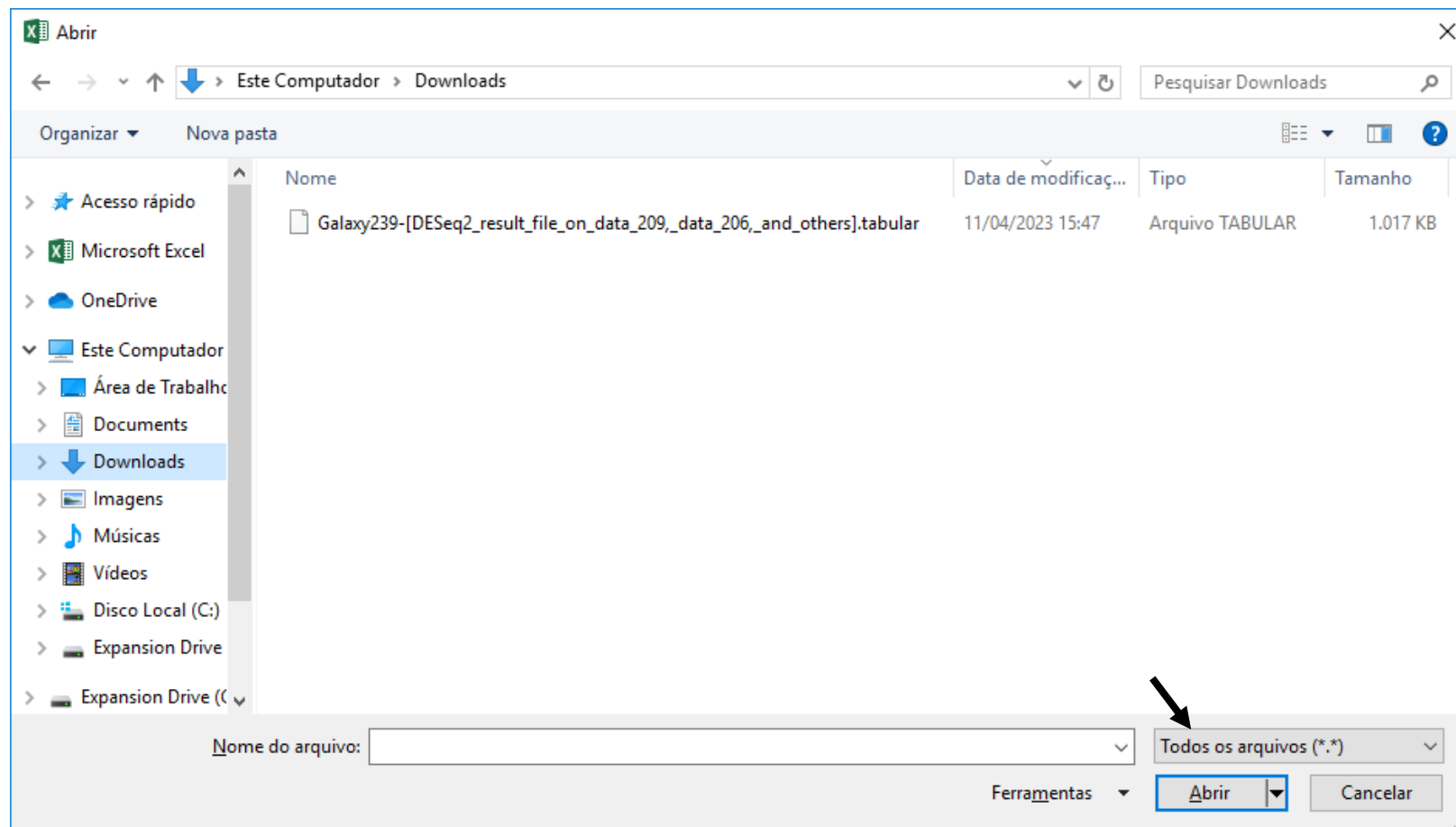
1. Fazer o download dos relatórios DESeq2
2. Abrir arquivos no Excel
3. Aplicar filtros ( $p_{adj}$  e  $\log_2fc$ )
4. Classificar lista de genes

# Download dos resultados

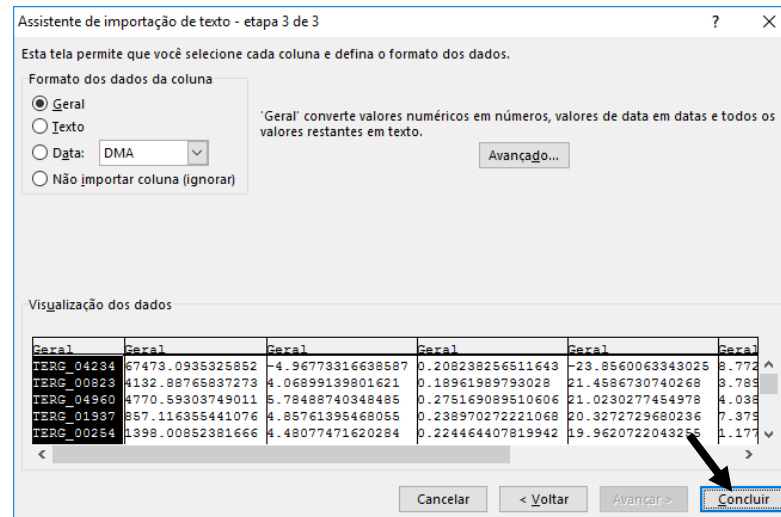
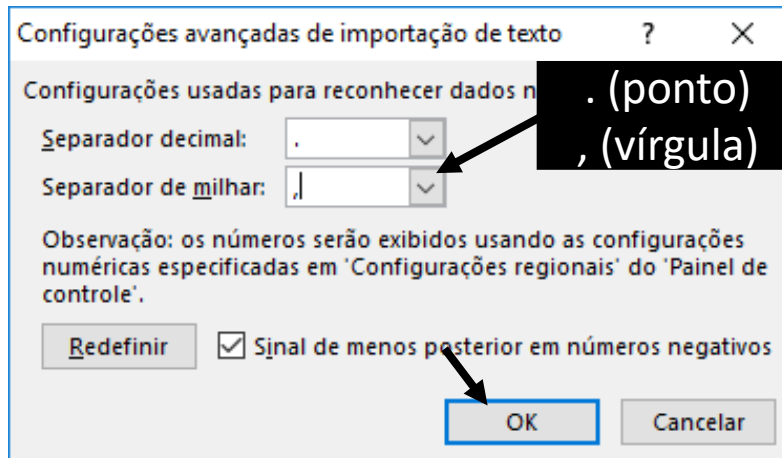
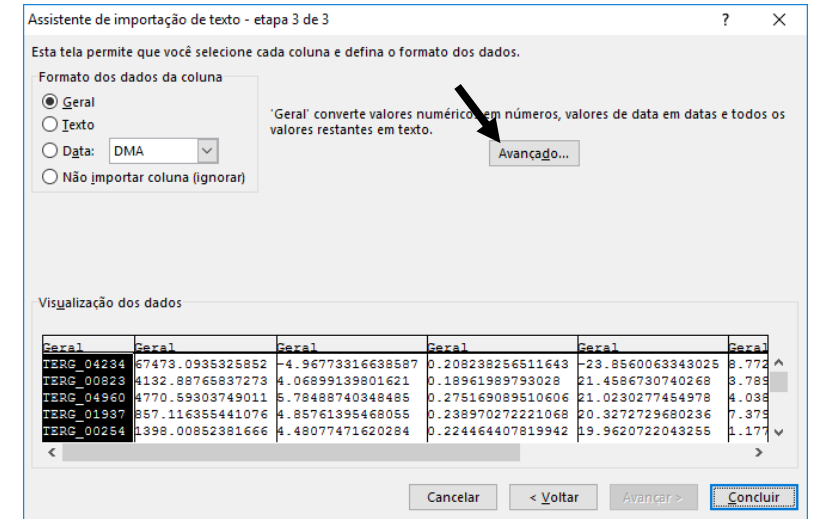
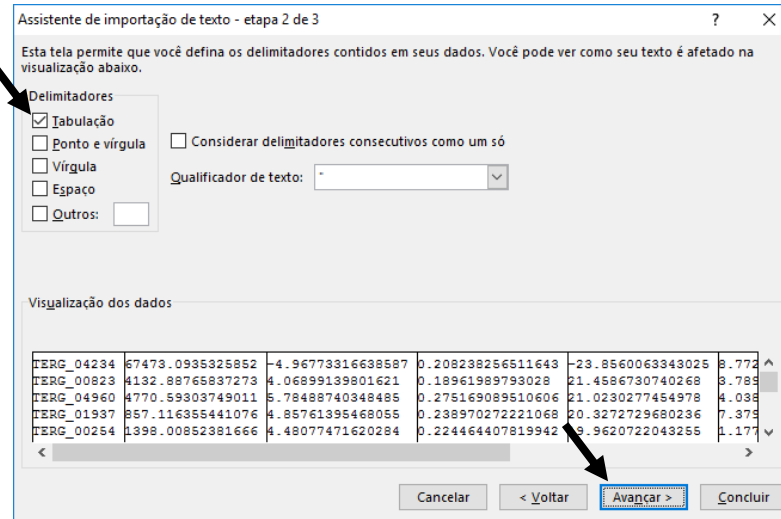
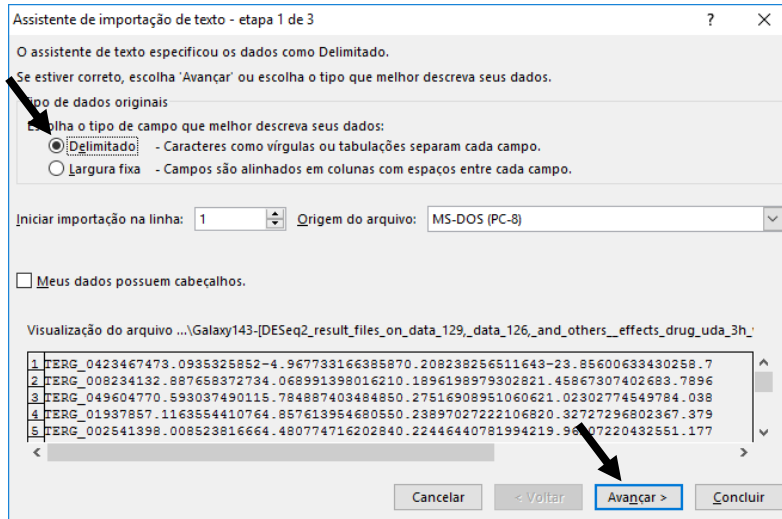
The screenshot shows the Galaxy web interface. The main content is a table of DESeq2 results. The table has the following columns: GeneID, Base mean, log2(FC), StdErr, Wald-Stats, P-value, and P-adj. The table contains 30 rows of data. On the right side, there is a History panel showing a list of datasets. The dataset '239 : DESeq2 result file on data 209, data 206, and others' is highlighted with a red box. An arrow points to the download icon (a square with a downward arrow) in the History panel. Below the History panel, there is a preview of the dataset content, which is a table with columns: 1. GeneID, 2. Base mean, 3. log2(FC). The preview shows the first few rows of the table.

GeneID	Base mean	log2(FC)	StdErr	Wald-Stats	P-value	P-adj
TERG_04937	60894.141693394	5.41644203570673	0.110759302035499	48.9028184194476	0	0
TERG_04952	430607.920123861	6.77874544684291	0.14063961661639	48.1994022020129	0	0
TERG_07830	5571.12234052747	5.41472389206682	0.13191940262864	41.0456974002223	0	0
TERG_08041	85730.1696860086	5.36264676418039	0.104038869705649	51.5446465282888	0	0
TERG_08751	365274.12353951	5.73514717500478	0.132353851585295	43.3319250351305	0	0
TERG_01782	44707.7653042112	8.012127514711	0.223592974143738	35.8335390553035	3.31911302080352e-281	4.75407621679757e-278
TERG_01543	60686.2721653453	5.3320312578694	0.150476948503839	35.4342064406181	5.07914873177471e-275	6.23574345726741e-272
TERG_04003	6890.85630730244	2.91161051618903	0.0848161525935421	34.3284908258232	2.9496868784941e-258	3.16870112922229e-255
TERG_01113	26952.2952467852	2.88914318805371	0.0864529654205205	33.4186707650856	7.34316843034225e-245	7.01190994337348e-242
TERG_00010	1655.6099033574	4.72543076219962	0.149916619097384	31.5203930734993	4.56551098617562e-218	3.92360014323813e-215
TERG_04950	6450.53043574702	3.58323535061473	0.117273236368155	30.5545874027549	4.91437169416522e-205	3.83946457633236e-202
TERG_08195	19002.0868009922	3.69518805983612	0.122213620976518	30.2354846400151	8.09656188130387e-201	5.79848773399379e-198
TERG_06347	17160.6355489803	4.48379855177771	0.152912977632212	29.3225507815445	5.35099487377477e-189	3.53741922655541e-186
TERG_07465	7556.96227185147	3.87391351808623	0.136118647111639	28.4598297168574	3.6828134937616e-178	2.26072136895623e-175
TERG_06779	34133.8522493733	3.8291794740426	0.135431893876213	28.2738383437401	7.25023367096762e-176	4.15390054455305e-173
TERG_03829	7069.58107920694	4.81372839755162	0.170565975091292	28.2220905721388	3.13316967474257e-175	1.6829037615461e-172
TERG_01460	21084.3356667712	3.43362326481343	0.126808029197375	27.0773332457445	1.82096121969719e-161	9.20549454239861e-159
TERG_01572	7243.0420514299	2.8916571323994	0.107088226299974	27.0025681842869	1.37875437280344e-160	6.58278615548487e-158
TERG_07556	3066.9462190158	3.20722828371639	0.121092416030572	26.4857898524932	1.41305224598829e-154	6.39145842211756e-152
TERG_11731	56706.2477779122	3.10988394777939	0.118994821083347	26.1346159393033	1.47429213021808e-150	6.33503328354711e-148
TERG_04953	15011.3948196924	2.59515000638816	0.100808712322913	25.7433107376008	3.83025068842721e-146	1.56748449601636e-143
TERG_08283	916.681787157463	4.30428816473097	0.169980076370613	25.3223098649879	1.81444383845478e-141	7.08787743076382e-139
TERG_06701	12816.911199228	3.3600427191289	0.133597144934813	25.1505578264296	1.39347733861163e-139	5.20675836870798e-137
TERG_12230	2199.67961004117	3.03622773959201	0.121071214467827	25.0780315778434	8.63761627006312e-139	3.09298642603843e-136
TERG_07094	6248.88829132656	2.79152631625213	0.113025766190292	24.6981410576917	1.11981623005762e-134	3.84948027244608e-132
TERG_04007	12320.1820847007	2.78703045182618	0.113018350056601	24.4010671000403	1.83034765113511e-132	6.07075142840582e-130

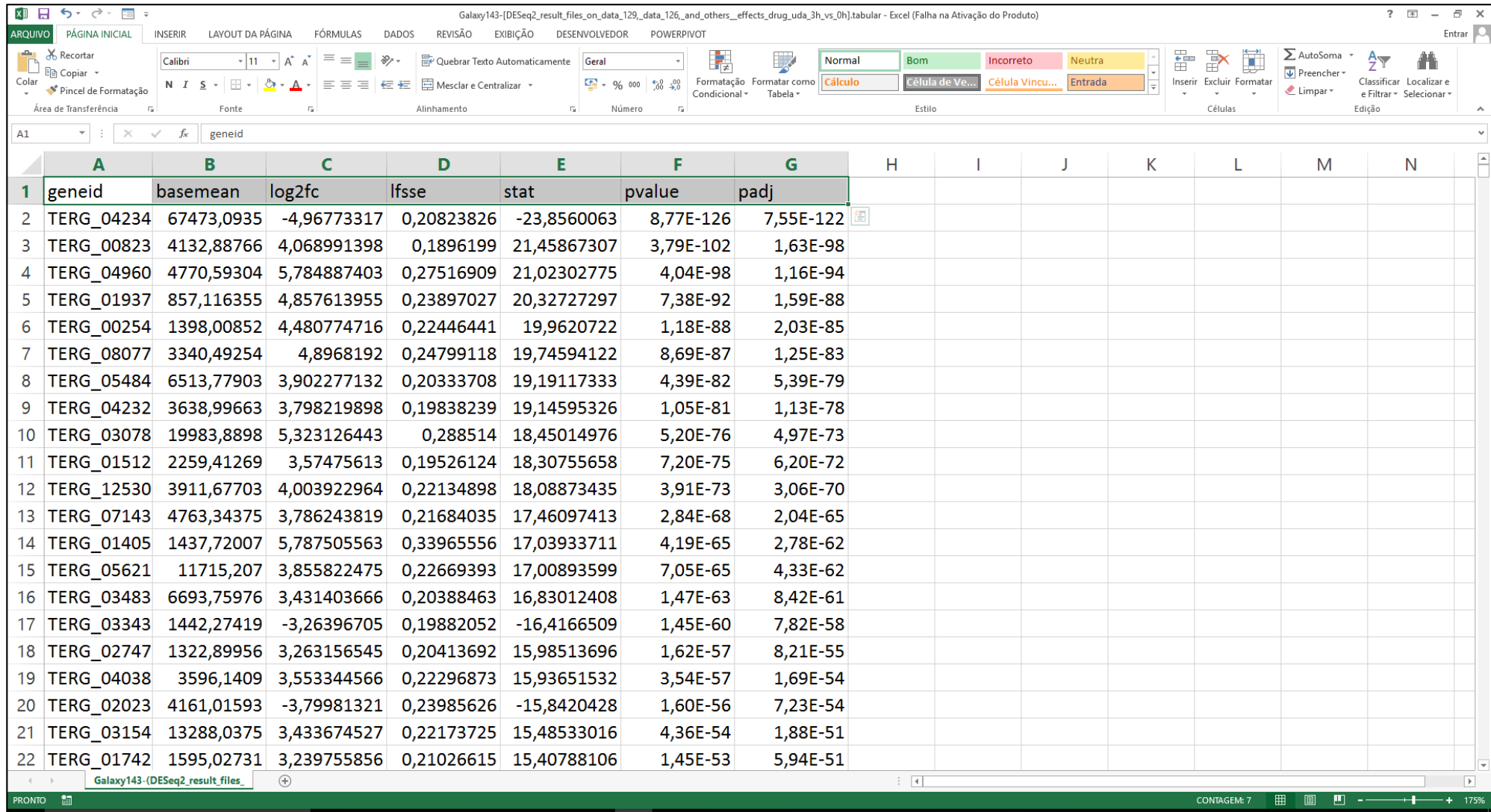
# Abrir no Excel



# Abrir Relatório no Excel



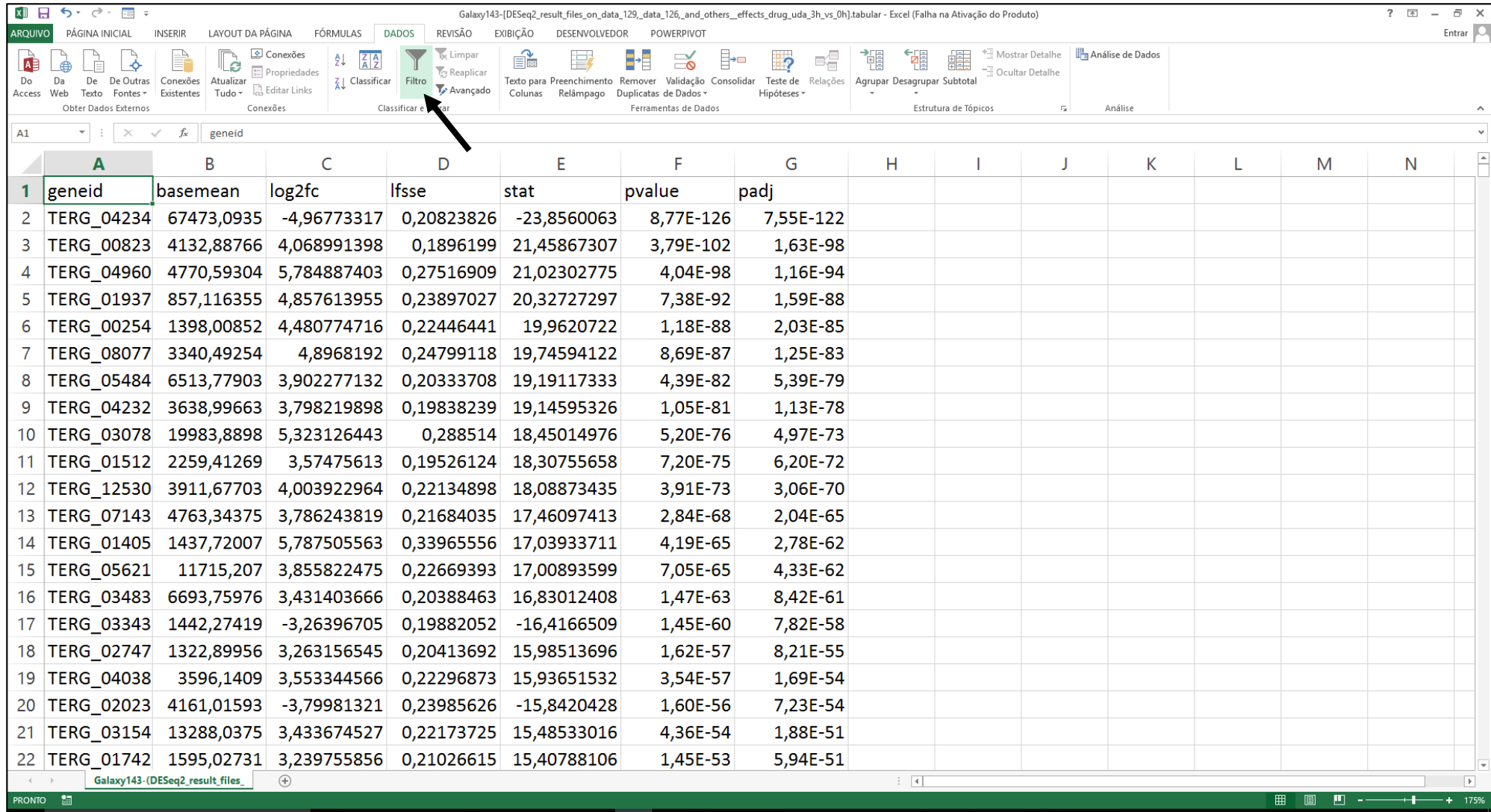
# Adicionar linha de cabeçalho



The screenshot shows the Microsoft Excel interface with a data table. The table has 22 rows and 7 columns. The first row is highlighted in grey, indicating it is the selected header row. The data in the table is as follows:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	geneid	basemean	log2fc	lfsse	stat	pvalue	padj							
2	TERG_04234	67473,0935	-4,96773317	0,20823826	-23,8560063	8,77E-126	7,55E-122							
3	TERG_00823	4132,88766	4,068991398	0,1896199	21,45867307	3,79E-102	1,63E-98							
4	TERG_04960	4770,59304	5,784887403	0,27516909	21,02302775	4,04E-98	1,16E-94							
5	TERG_01937	857,116355	4,857613955	0,23897027	20,32727297	7,38E-92	1,59E-88							
6	TERG_00254	1398,00852	4,480774716	0,22446441	19,9620722	1,18E-88	2,03E-85							
7	TERG_08077	3340,49254	4,8968192	0,24799118	19,74594122	8,69E-87	1,25E-83							
8	TERG_05484	6513,77903	3,902277132	0,20333708	19,19117333	4,39E-82	5,39E-79							
9	TERG_04232	3638,99663	3,798219898	0,19838239	19,14595326	1,05E-81	1,13E-78							
10	TERG_03078	19983,8898	5,323126443	0,288514	18,45014976	5,20E-76	4,97E-73							
11	TERG_01512	2259,41269	3,57475613	0,19526124	18,30755658	7,20E-75	6,20E-72							
12	TERG_12530	3911,67703	4,003922964	0,22134898	18,08873435	3,91E-73	3,06E-70							
13	TERG_07143	4763,34375	3,786243819	0,21684035	17,46097413	2,84E-68	2,04E-65							
14	TERG_01405	1437,72007	5,787505563	0,33965556	17,03933711	4,19E-65	2,78E-62							
15	TERG_05621	11715,207	3,855822475	0,22669393	17,00893599	7,05E-65	4,33E-62							
16	TERG_03483	6693,75976	3,431403666	0,20388463	16,83012408	1,47E-63	8,42E-61							
17	TERG_03343	1442,27419	-3,26396705	0,19882052	-16,4166509	1,45E-60	7,82E-58							
18	TERG_02747	1322,89956	3,263156545	0,20413692	15,98513696	1,62E-57	8,21E-55							
19	TERG_04038	3596,1409	3,553344566	0,22296873	15,93651532	3,54E-57	1,69E-54							
20	TERG_02023	4161,01593	-3,79981321	0,23985626	-15,8420428	1,60E-56	7,23E-54							
21	TERG_03154	13288,0375	3,433674527	0,22173725	15,48533016	4,36E-54	1,88E-51							
22	TERG_01742	1595,02731	3,239755856	0,21026615	15,40788106	1,45E-53	5,94E-51							

# Aplicar filtro



The screenshot shows the Microsoft Excel interface with the 'DADOS' (Data) ribbon selected. The 'Filtro' (Filter) icon is highlighted with a black arrow. The spreadsheet contains a table with 22 rows of data. The first row is the header, and the subsequent rows contain numerical values for various genes.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	geneid	basemean	log2fc	lfsse	stat	pvalue	padj							
2	TERG_04234	67473,0935	-4,96773317	0,20823826	-23,8560063	8,77E-126	7,55E-122							
3	TERG_00823	4132,88766	4,068991398	0,1896199	21,45867307	3,79E-102	1,63E-98							
4	TERG_04960	4770,59304	5,784887403	0,27516909	21,02302775	4,04E-98	1,16E-94							
5	TERG_01937	857,116355	4,857613955	0,23897027	20,32727297	7,38E-92	1,59E-88							
6	TERG_00254	1398,00852	4,480774716	0,22446441	19,9620722	1,18E-88	2,03E-85							
7	TERG_08077	3340,49254	4,8968192	0,24799118	19,74594122	8,69E-87	1,25E-83							
8	TERG_05484	6513,77903	3,902277132	0,20333708	19,19117333	4,39E-82	5,39E-79							
9	TERG_04232	3638,99663	3,798219898	0,19838239	19,14595326	1,05E-81	1,13E-78							
10	TERG_03078	19983,8898	5,323126443	0,288514	18,45014976	5,20E-76	4,97E-73							
11	TERG_01512	2259,41269	3,57475613	0,19526124	18,30755658	7,20E-75	6,20E-72							
12	TERG_12530	3911,67703	4,003922964	0,22134898	18,08873435	3,91E-73	3,06E-70							
13	TERG_07143	4763,34375	3,786243819	0,21684035	17,46097413	2,84E-68	2,04E-65							
14	TERG_01405	1437,72007	5,787505563	0,33965556	17,03933711	4,19E-65	2,78E-62							
15	TERG_05621	11715,207	3,855822475	0,22669393	17,00893599	7,05E-65	4,33E-62							
16	TERG_03483	6693,75976	3,431403666	0,20388463	16,83012408	1,47E-63	8,42E-61							
17	TERG_03343	1442,27419	-3,26396705	0,19882052	-16,4166509	1,45E-60	7,82E-58							
18	TERG_02747	1322,89956	3,263156545	0,20413692	15,98513696	1,62E-57	8,21E-55							
19	TERG_04038	3596,1409	3,553344566	0,22296873	15,93651532	3,54E-57	1,69E-54							
20	TERG_02023	4161,01593	-3,79981321	0,23985626	-15,8420428	1,60E-56	7,23E-54							
21	TERG_03154	13288,0375	3,433674527	0,22173725	15,48533016	4,36E-54	1,88E-51							
22	TERG_01742	1595,02731	3,239755856	0,21026615	15,40788106	1,45E-53	5,94E-51							

# Aplicar filtro

The screenshot shows an Excel spreadsheet with the following data:

geneid	basemean	log2fc	lfsse	stat	pvalue	padj
TERG_04234	67473,0935	-4,96773317	0,20823826	-23,8560063		
TERG_00823	4132,88766	4,068991398	0,1896199	21,45867307		
TERG_04960	4770,59304	5,784887403	0,27516909	21,02302775		
TERG_01937	857,116355	4,857613955	0,23897027	20,32727297		
TERG_00254	1398,00852	4,480774716	0,22446441	19,9620722		
TERG_08077	3340,49254	4,8968192	0,24799118	19,74594122		
TERG_05484	6513,77903	3,902277132	0,20333708	19,19117333		
TERG_04232	3638,99663	3,798219898	0,19838239	19,14595326		
TERG_03078	19983,8898	5,323126443	0,288514	18,45014976		
TERG_01512	2259,41269	3,57475613	0,19526124	18,30755658		
TERG_12530	3911,67703	4,003922964	0,22134898	18,08873435		
TERG_07143	4763,34375	3,786243819	0,21684035	17,46097413	2,84E-68	2,04E-65
TERG_01405	1437,72007	5,787505563	0,33965556	17,03933711	4,19E-65	2,78E-62
TERG_05621	11715,207	3,855822475	0,22669393	17,00893599	7,05E-65	4,33E-62
TERG_03483	6693,75976	3,431403666	0,20388463	16,83012408	1,47E-63	8,42E-61
TERG_03343	1442,27419	-3,26396705	0,19882052	-16,4166509	1,45E-60	7,82E-58
TERG_02747	1322,89956	3,263156545	0,20413692	15,98513696	1,62E-57	8,21E-55
TERG_04038	3596,1409	3,553344566	0,22296873	15,93651532	3,54E-57	1,69E-54
TERG_02023	4161,01593	-3,79981321	0,23985626	-15,8420428	1,60E-56	7,23E-54
TERG_03154	13288,0375	3,433674527	0,22173725	15,48533016	4,36E-54	1,88E-51
TERG_01742	1595,02731	3,239755856	0,21026615	15,40788106	1,45E-53	5,94E-51

**Personalizar AutoFiltro**

Mostrar linhas onde:  
padj

é menor do que 0,05

E  Ou

Use ? para representar um único caractere  
Use \* para representar uma série de caracteres

OK Cancelar



# Aplicar filtro

Excel interface showing a data table with columns: geneid, basemean, log2fc, lfsse, stat, pvalue, padj. The filter menu is open for the 'log2fc' column, showing options like 'Filtros de Número' and 'Personalizar Filtro...'. The status bar at the bottom indicates 'PRONTO 2766 DE 8616 REGISTROS LOCALIZADOS.'

geneid	basemean	log2fc	lfsse	stat	pvalue	padj
TERG_04234	6		0,20823826	-23,8560063	8,77E-126	7,55E-122
TERG_00823	4		0,1896199	21,45867307	3,79E-102	1,63E-98
TERG_04960	4		0,27516909	21,02302775	4,04E-98	1,16E-94
TERG_01937	8		0,22087027	20,32727297	7,38E-92	1,59E-88
TERG_00254	1		19,9620722	1,18E-88	2,03E-85	
TERG_08077	3		19,74594122	8,69E-87	1,25E-83	
TERG_05484	6		19,19117333	4,39E-82	5,39E-79	
TERG_04232	3		19,14595326	1,05E-81	1,13E-78	
TERG_03078	1		18,45014976	5,20E-76	4,97E-73	
TERG_01512	2		18,30755658	7,20E-75	6,20E-72	
TERG_12530	3		18,08873435	3,91E-73	3,06E-70	
TERG_07143	4/63,343/5	3,786243819	0,21684035	17,46097413	2,84E-68	2,04E-65
TERG_01405	1437,72007	5,787505563	0,33965556	17,03933711	4,19E-65	2,78E-62
TERG_05621	11715,207	3,855822475	0,22669393	17,00893599	7,05E-65	4,33E-62
TERG_03483	6693,75976	3,431403666	0,20388463	16,83012408	1,47E-63	8,42E-61
TERG_03343	1442,27419	-3,26396705	0,19882052	-16,4166509	1,45E-60	7,82E-58
TERG_02747	1322,89956	3,263156545	0,20413692	15,98513696	1,62E-57	8,21E-55
TERG_04038	3596,1409	3,553344566	0,22296873	15,93651532	3,54E-57	1,69E-54
TERG_02023	4161,01593	-3,79981321	0,23985626	-15,8420428	1,60E-56	7,23E-54
TERG_03154	13288,0375	3,433674527	0,22173725	15,48533016	4,36E-54	1,88E-51
TERG_01742	1595,02731	3,239755856	0,21026615	15,40788106	1,45E-53	5,94E-51

Personalizar AutoFiltro

Mostrar linhas onde:  
log2fc

é maior ou igual a 1,5

E  Ou

é menor ou igual a -1,5

Use ? para representar um único caractere  
Use \* para representar uma série de caracteres

OK Cancelar

# Classificar



The screenshot shows the Microsoft Excel interface with the 'DADOS' (Data) ribbon selected. The 'Classificar' (Sort) button is highlighted with a black arrow. The 'Classificar' dialog box is open, showing the following settings:

- Adicionar Nível:
- Excluir Nível:
- Copiar Nível:
- Opções...:
- Meus dados contém cabeçalhos:
- Coluna:
- Classificar em:
- Ordem:

The data table below shows the following columns and values:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	geneid	basemean	log2fc	lfsse	stat	pvalue	padj							
2	TERG_04234	67473,0935	-4,96773317	0,20823826	-23,8560063	8,77E-126	7,55E-122							
3	TERG_00823	4132,88766	4,068991398	0,1896199	21,45867307	3,79E-102	1,63E-98							
4	TERG_04960	4770,59304	5,784887403	0,27516909	21,02302775	4,04E-98	1,16E-94							
5	TERG_01937	857,116355	4,857613955	0,23897027	20,32727297	7,38E-92	1,59E-88							
6	TERG_00254	1398,00852	4,480774716	0,22446441	19,9620722	1,18E-88	2,03E-85							
7	TERG_08077	3340,49254	4,8968192	0,24799118	19,74594122	8,69E-87	1,25E-83							
8	TERG_05484	6513,77903	3,902277132	0,20333708	19,19117333	4,39E-82	5,39E-79							
9	TERG_04232	3638,99663	3,798219898	0,19838239	19,14595326	1,05E-81	1,13E-78							
10	TERG_03078	19983,8898	5,323126443	0,288514	18,45014976	5,20E-76	4,97E-73							
11	TERG_01512	2259,41269	3,57475613	0,19526124	18,30755658	7,20E-75	6,20E-72							
12	TERG_12530	3911,67703	4,003922964	0,22134898	18,08873435	3,91E-73	3,06E-70							
13	TERG_07143	4763,34375	3,786243819	0,21684035	17,46097413	2,84E-68	2,04E-65							
14	TERG_01405	1437,72007	5,787505563	0,33965556	17,03933711	4,19E-65	2,78E-62							
15	TERG_05621	11715,207	3,855822475	0,22669393	17,00893599	7,05E-65	4,33E-62							
16	TERG_03483	6693,75976	3,431403666	0,20388463	16,83012408	1,47E-63	8,42E-61							
17	TERG_03343	1442,27419	-3,26396705	0,19882052	-16,4166509	1,45E-60	7,82E-58							
18	TERG_02747	1322,89956	3,263156545	0,20413692	15,98513696	1,62E-57	8,21E-55							
19	TERG_04038	3596,1409	3,553344566	0,22296873	15,93651532	3,54E-57	1,69E-54							
20	TERG_02023	4161,01593	-3,79981321	0,23985626	-15,8420428	1,60E-56	7,23E-54							
21	TERG_03154	13288,0375	3,433674527	0,22173725	15,48533016	4,36E-54	1,88E-51							
22	TERG_01742	1595,02731	3,239755856	0,21026615	15,40788106	1,45E-53	5,94E-51							

# Identificar DEG de acordo com filtro aplicado

Up-regulated   
Down-regulated 

	A	B	C	D	E	F	G
250	TERG_05373	1109,05175	1,528107716	0,25490848	5,994730689	2,04E-09	3,50E-08
251	TERG_05359	439,727645	1,526386291	0,23918966	6,381489478	1,75E-10	3,55E-09
252	TERG_03780	4331,70879	1,521459754	0,52149348	2,917504866	0,00352844	0,01413512
253	TERG_04810	595,617068	1,519293604	0,22945235	6,621390425	3,56E-11	7,95E-10
254	TERG_01162	1478,10361	1,516080786	0,24535125	6,179225729	6,44E-10	1,18E-08
255	TERG_03293	923,148379	1,512233252	0,30786756	4,911960441	9,02E-07	8,96E-06
256	TERG_02265	149,250993	1,511164988	0,30335342	4,981532671	6,31E-07	6,52E-06
257	TERG_00645	2,73334975	1,509294854	0,57171791	2,639929285	0,00829233	0,02888888
258	TERG_01056	815,553303	1,502869485	0,23109582	6,503230859	7,86E-11	1,68E-09
259	TERG_12230	38,3769389	1,5018798	0,4172365	3,599588691	0,00031872	0,00173692
260	TERG_01902	228,504906	-1,50040389	0,2667047	-5,62571227	1,85E-08	2,63E-07
261	TERG_01328	2287,03045	-1,50459531	0,23410878	-6,42690683	1,30E-10	2,69E-09
262	TERG_03708	434,421098	-1,50529945	0,24572712	-6,12589869	9,02E-10	1,62E-08
263	TERG_05090	2520,94328	-1,5071312	0,21008185	-7,17401923	7,28E-13	2,02E-11
264	TERG_00899	1207,41225	-1,5081209	0,20814646	-7,24547954	4,31E-13	1,20E-11
265	TERG_02973	1263,98304	-1,51067689	0,23725262	-6,36737707	1,92E-10	3,88E-09
266	TERG_02353	248,71023	-1,51110977	0,30436207	-4,96484268	6,88E-07	7,02E-06
267	TERG_06267	2004,05142	-1,51630852	0,22184869	-6,83487707	8,21E-12	2,00E-10
268	TERG_00529	76,6678404	-1,51812157	0,37650845	-4,03210491	5,53E-05	0,00036535
269	TERG_02664	1378,28164	-1,51906445	0,25975773	-5,84800475	4,98E-09	7,87E-08
270	TERG_11814	332,6269	-1,51918289	0,33144986	-4,58344702	4,57E-06	3,92E-05
271	TERG_04478	16108,7043	-1,51992011	0,21445622	-7,08732125	1,37E-12	3,67E-11