R for toxicology (RNA-Seq)

How to use Metascape?

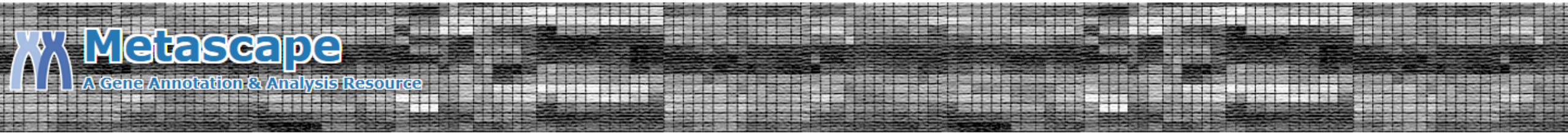
Objective

- Learning how to use Metascape for RNA-Seq analysis

What is Metascape?

- Very useful tool for enrichment analysis
- Metascape is an online-based tool (webpage)
- URL: https://metascape.org/

What is Metascape?



Step 1

Multiple Gene Lists

Drag & drop your file (.xls,.xlsx,.csv,.txt)

Select File...

Or paste a gene list

Accept Gene ID/Symbol/RefSeq/ Ensembl/UniProt/UCSC

Upload File Format

Single List:

.xls/xlsx .csv .txt

Multiple List:

.xls/xlsx .csv .txt

Test Upload

single list

3 gene lists

Test Identifiers

Gene Symbol try it!

RefSeq

Entrez Gene ID

Step 2

Step 3

Express Analysis | Custom Analysis | Batch Analysis?

Please cite Zhou et al. Nature Commun. 2019 10(1):1523 within any publication that makes use of analyses inspired by Metascape.

Public questions: forum. Private questions: metascape.team at gmail.com

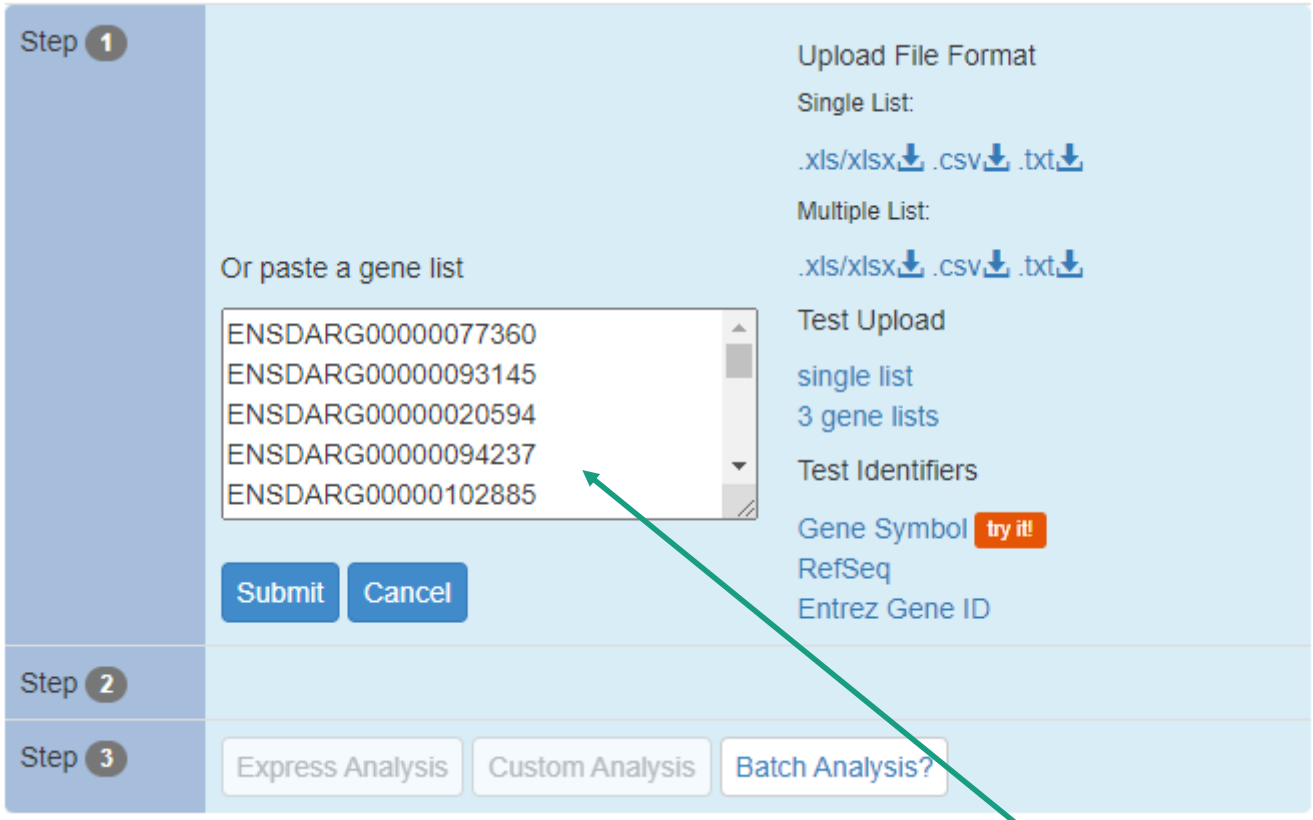
News & Updates

- Current version v3.5.20240101
- Code Release History
- *2021-12-18* Release MSBio.
- *2021-02-01* Include STRING, EggNog, WikiPathways.
- *2018-11-11* Include DisGeNET, TRRUST, HPO, PaGenBase, L1000.
- *2017-09-15* Include CORUM, rearchitect GPEC beta.
- *2016-11-2* Support model organisms and PPI analysis!
- *2015-12-9* First Metascape Publication [link]
- *2015-10-8* Launch of metascape.org at UCSD.

Message Board

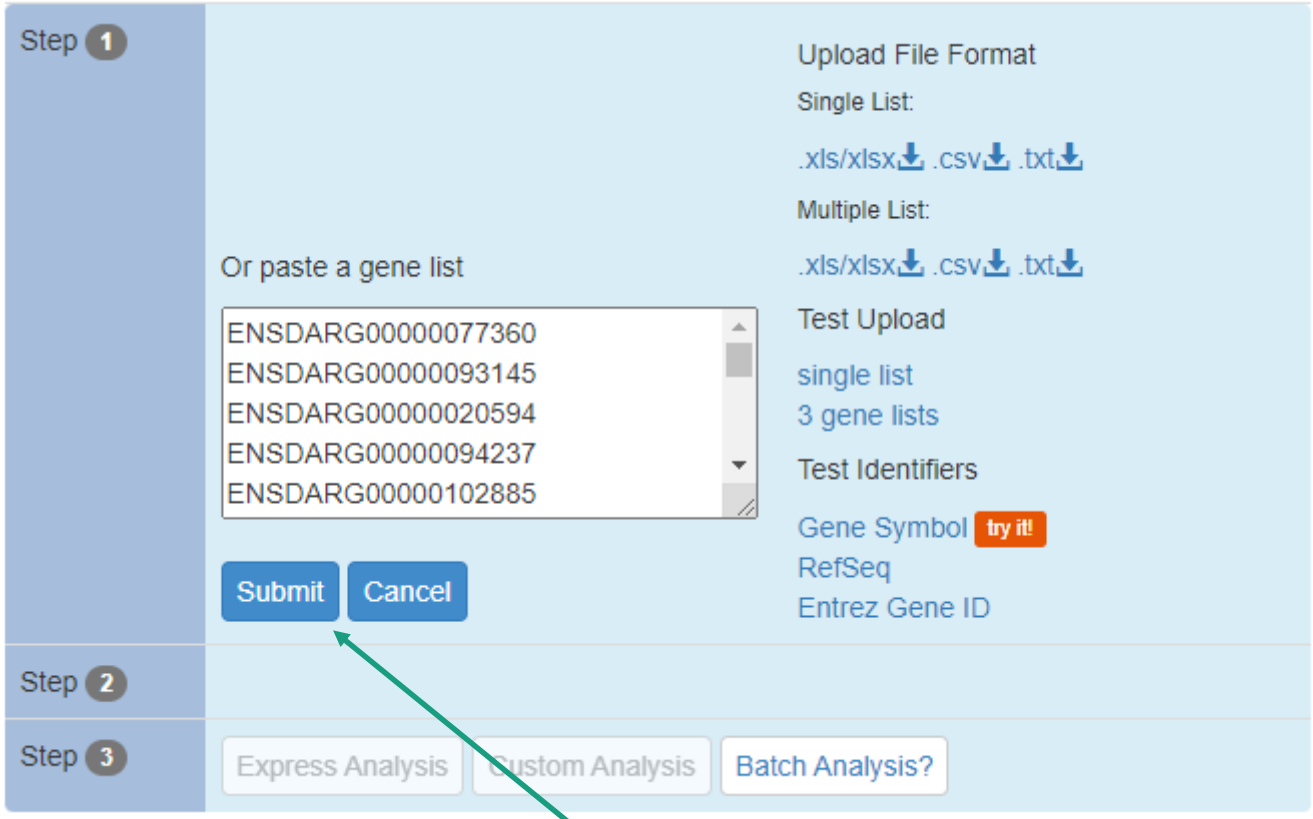
- *2024-02-19* Alpha release of a new MSBio, support Singularity technology.
- *2023-12-12* New blog: behind the scene of the enrichment clustering algorithm.
- *2023-12-04* Database updated to release 2024-01-01 (StringDB 12.0). MSBio updated accordinly.
- *2023-06-22* ChatGPT-based gene annotation added (see blog).

Step 1: add DEGs



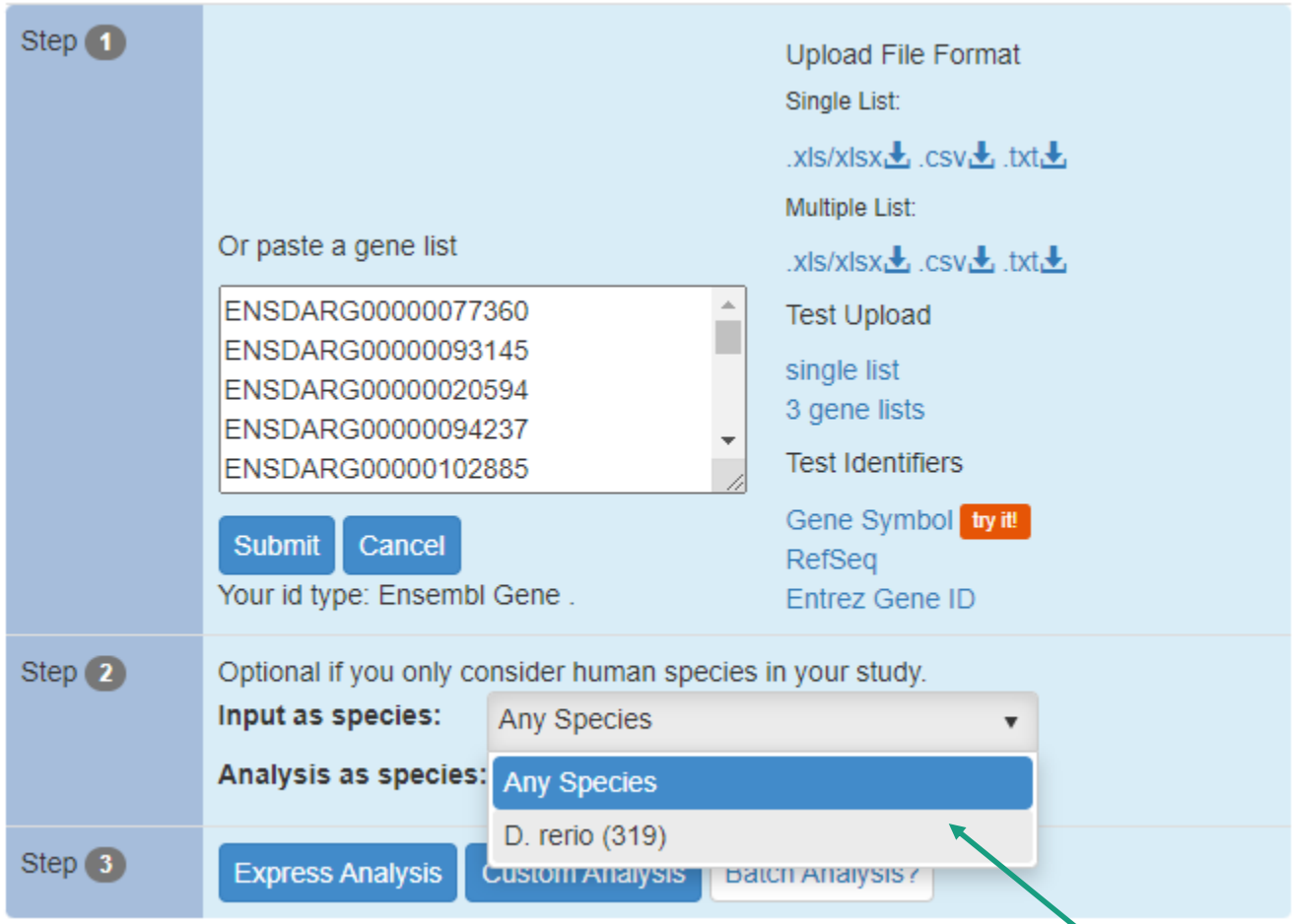
Ensembl ID of DEGs

Step 2: click submit



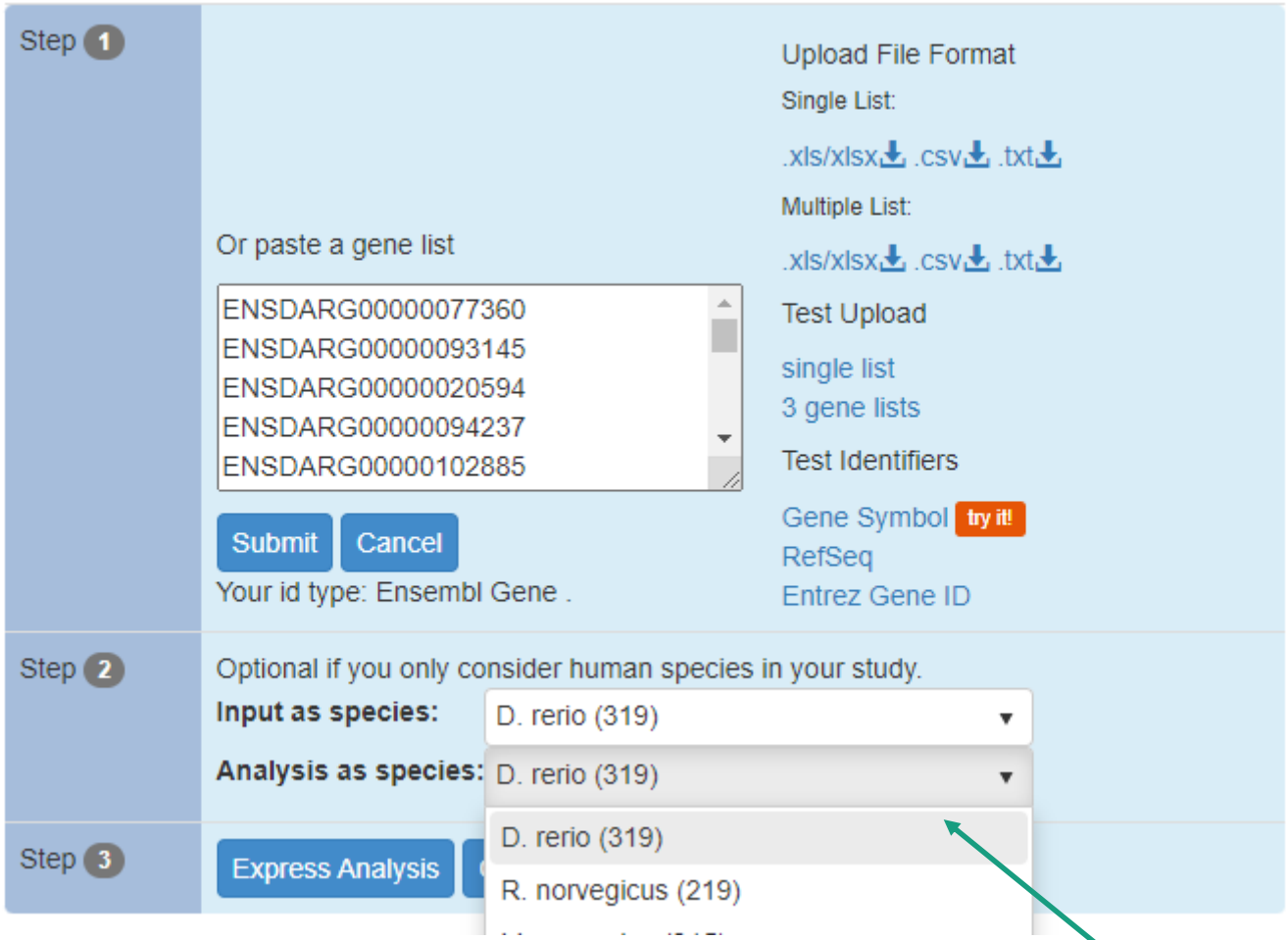
Click here

Step 3: select species



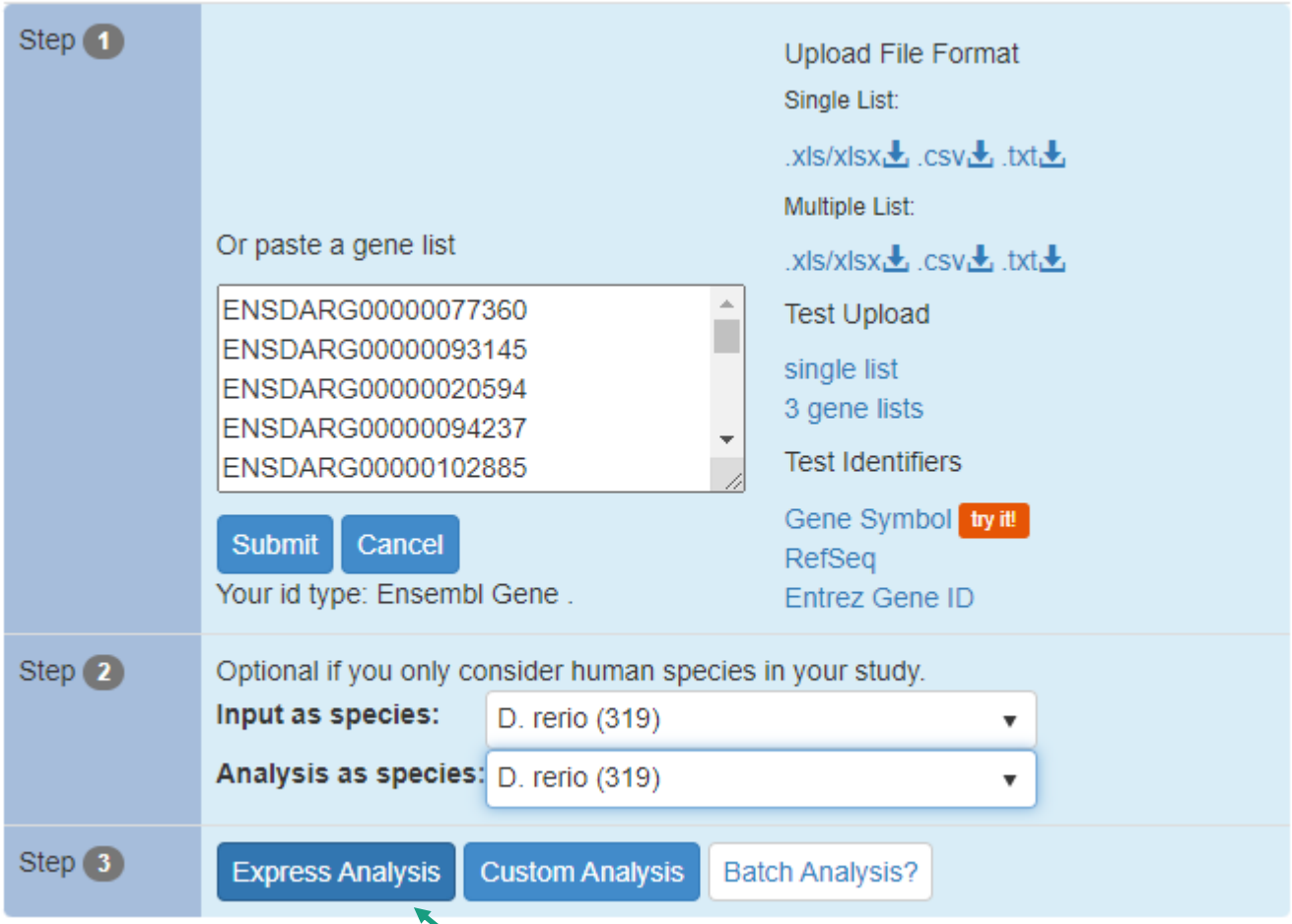
Select D. rerio in ‘Input as species’

Step 3: select species



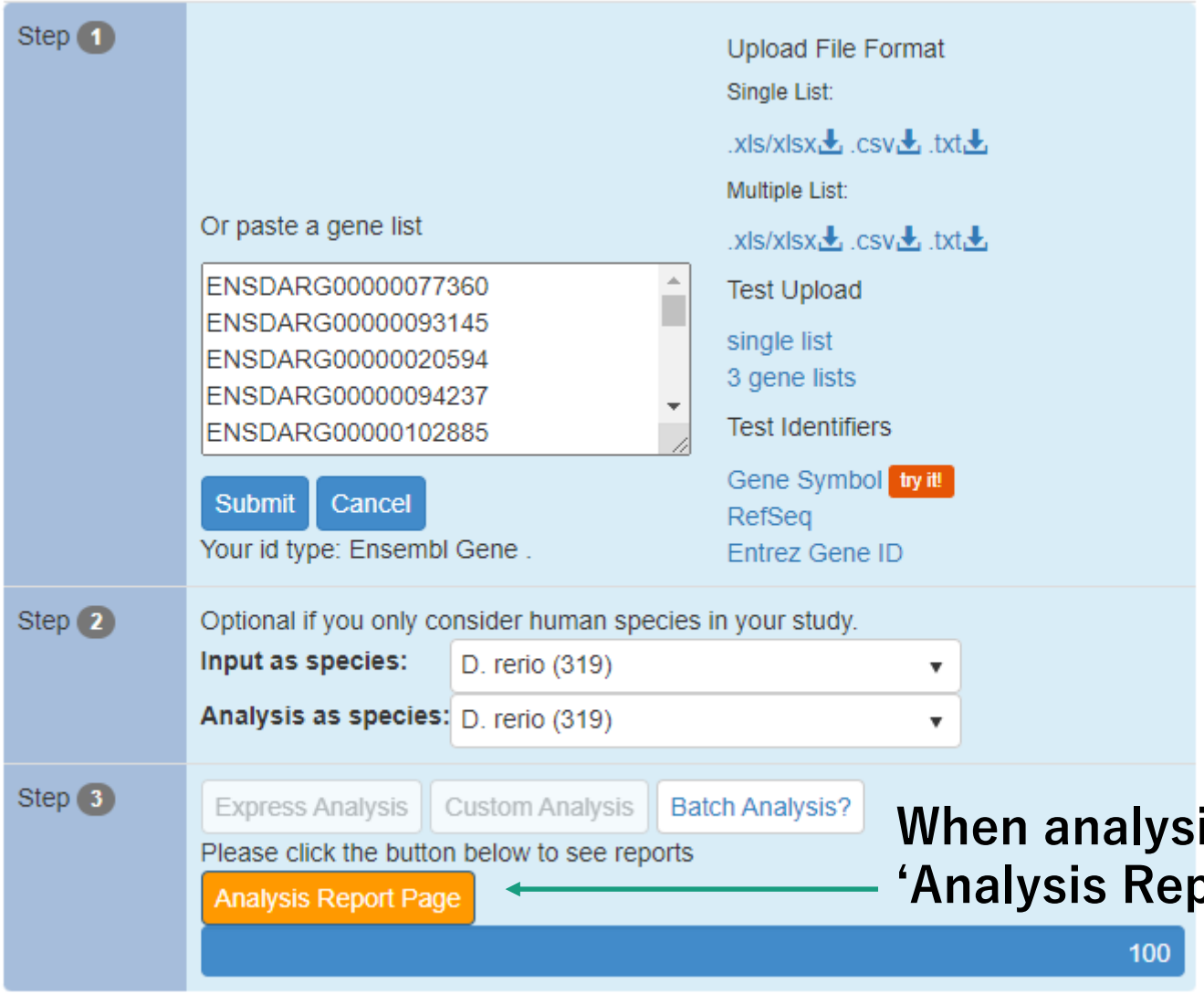
Select D. rerio in ‘Analysis as species’

Step 3: select species



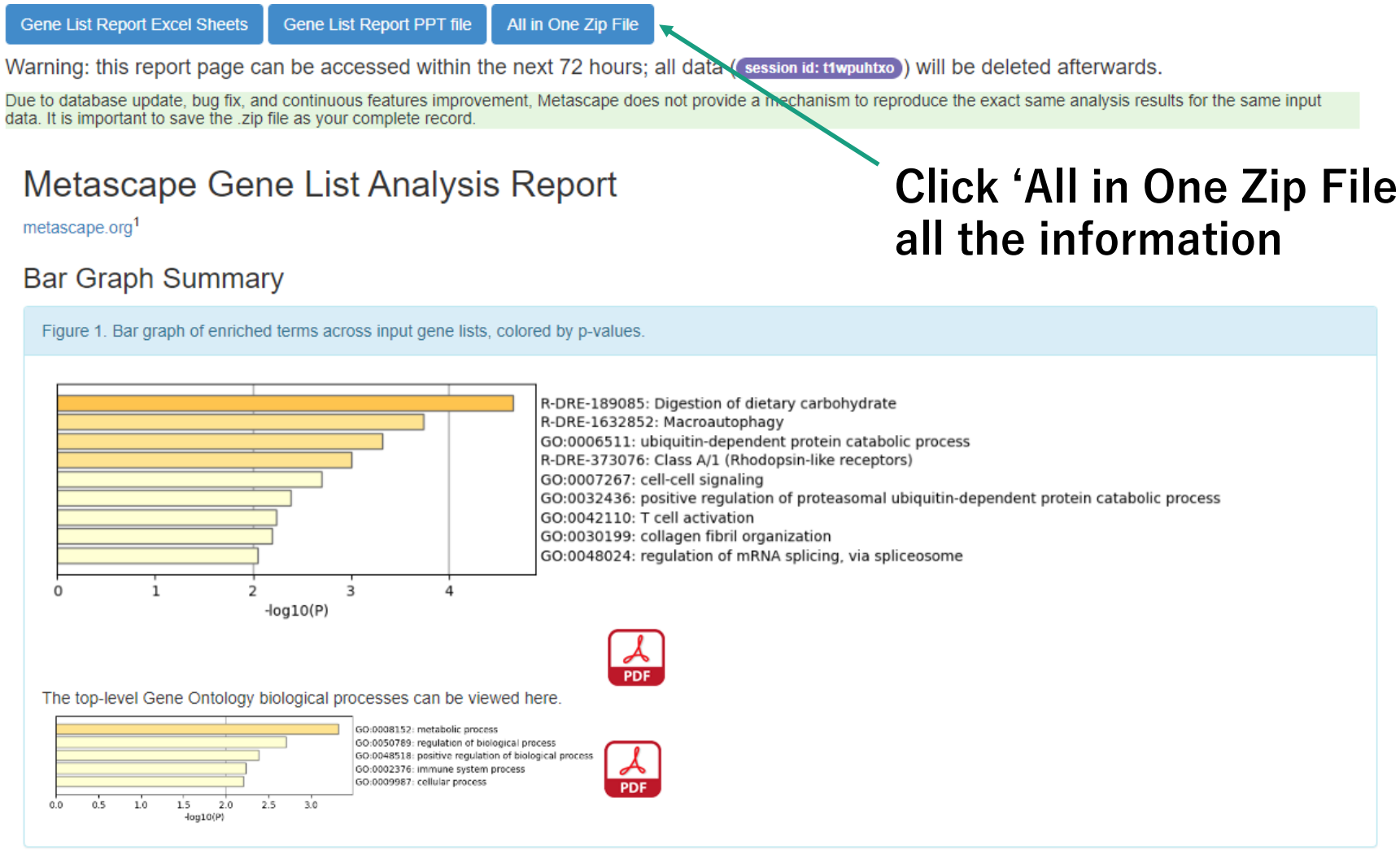
Click ‘Express Analysis’

Step 4: Wait



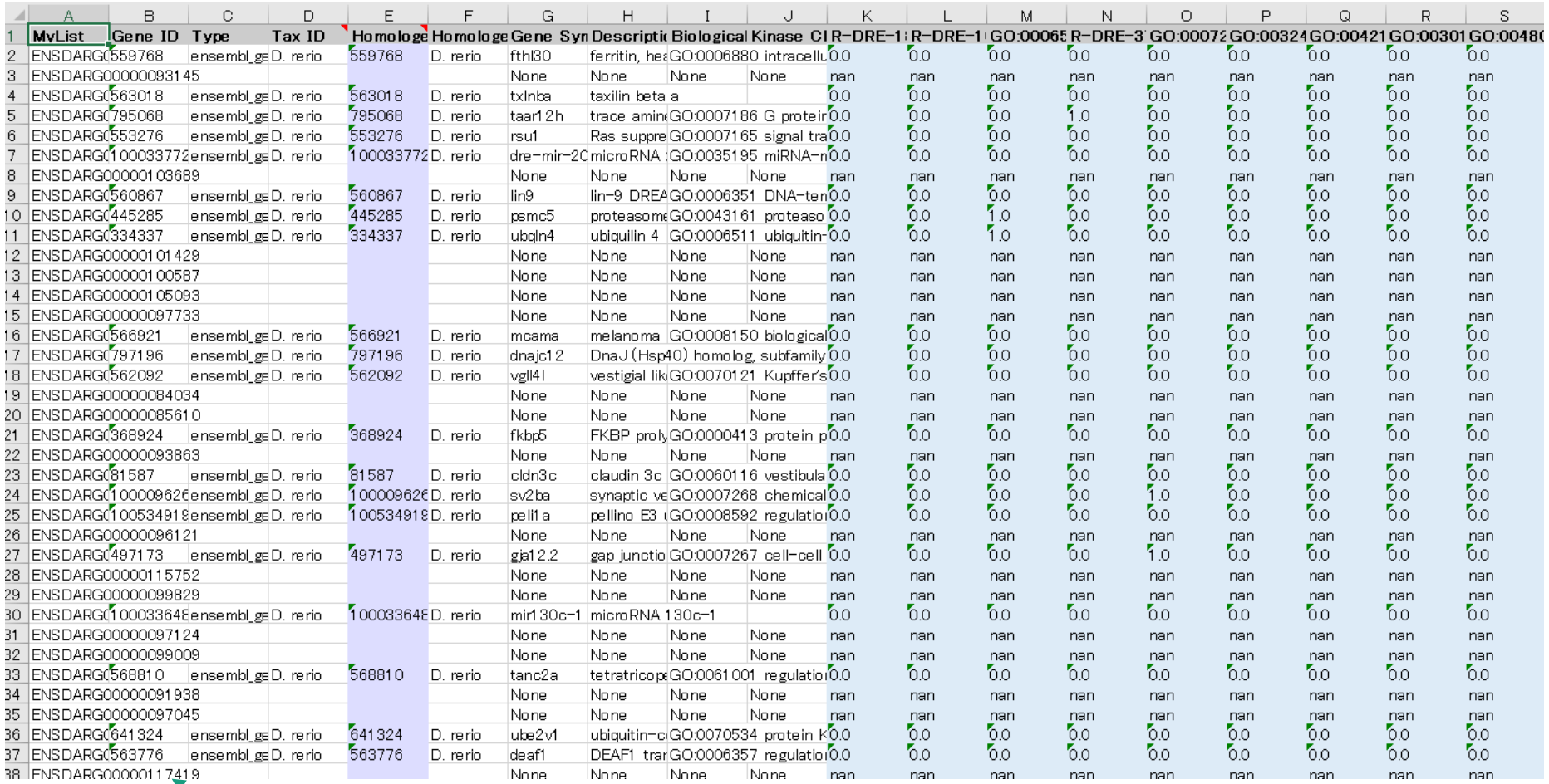
When analysis is completed, click ‘Analysis Report Page’

Step 5: download



Click ‘All in One Zip File’ to download all the information

Step 6: check files



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	MyList	Gene ID	Type	Tax ID	Homologe	Homologe	Gene Syn	Descriptic	Biological	Kinase Cl	R-DRE-1	R-DRE-1	GO:00065	R-DRE-3	GO:00072	GO:00324	GO:00421	GO:00301	GO:00480
2	ENSDARG0	559768	ensembl_ge	D. rerio	559768	D. rerio	fthl30	ferritin, hea	GO:0006880	intracellu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	ENSDARG00000093145						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
4	ENSDARG0	563018	ensembl_ge	D. rerio	563018	D. rerio	txlnba	taxilin beta a			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	ENSDARG0	795068	ensembl_ge	D. rerio	795068	D. rerio	taar12h	trace amine	GO:0007186	G protein	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
6	ENSDARG0	553276	ensembl_ge	D. rerio	553276	D. rerio	rsu1	Ras suppre	GO:0007165	signal tra	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	ENSDARG1	00033772	ensembl_ge	D. rerio	100033772	D. rerio	dre-mir-20	microRNA :	GO:0035195	miRNA-m	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	ENSDARG00000103689						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
9	ENSDARG0	560867	ensembl_ge	D. rerio	560867	D. rerio	lin9	lin-9 DREA	GO:0006351	DNA-ten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	ENSDARG0	445285	ensembl_ge	D. rerio	445285	D. rerio	psmc5	proteasome	GO:0043161	proteaso	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
11	ENSDARG0	334337	ensembl_ge	D. rerio	334337	D. rerio	ubqln4	ubiquilin 4	GO:0006511	ubiquitin-	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
12	ENSDARG00000101429						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
13	ENSDARG00000100587						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
14	ENSDARG00000105093						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
15	ENSDARG00000097733						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
16	ENSDARG0	566921	ensembl_ge	D. rerio	566921	D. rerio	mcama	melanoma	GO:0008150	biological	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	ENSDARG0	797196	ensembl_ge	D. rerio	797196	D. rerio	dnajc12	DnaJ (Hsp40) homolog, subfamily			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	ENSDARG0	562092	ensembl_ge	D. rerio	562092	D. rerio	vgll4l	vestigial lik	GO:0070121	Kupffer's	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	ENSDARG00000084034						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
20	ENSDARG00000085610						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
21	ENSDARG0	368924	ensembl_ge	D. rerio	368924	D. rerio	fkbp5	FKBP proly	GO:0000413	protein p	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	ENSDARG00000093863						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
23	ENSDARG0	81587	ensembl_ge	D. rerio	81587	D. rerio	cldn3c	claudin 3c	GO:0060116	vestibula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	ENSDARG1	00009626	ensembl_ge	D. rerio	100009626	D. rerio	sv2ba	synaptic ve	GO:0007268	chemical	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
25	ENSDARG1	00534918	ensembl_ge	D. rerio	100534918	D. rerio	pelil1a	pellino E3 (	GO:0008592	regulatio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	ENSDARG00000096121						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
27	ENSDARG0	497173	ensembl_ge	D. rerio	497173	D. rerio	gja12.2	gap junctio	GO:0007267	cell-cell	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
28	ENSDARG00000115752						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
29	ENSDARG00000099829						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
30	ENSDARG1	00033648	ensembl_ge	D. rerio	100033648	D. rerio	mir130c-1	microRNA 1	30c-1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	ENSDARG00000097124						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
32	ENSDARG00000099009						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
33	ENSDARG0	568810	ensembl_ge	D. rerio	568810	D. rerio	tanc2a	tetratricope	GO:0061001	regulatio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	ENSDARG00000091938						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
35	ENSDARG00000097045						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan
36	ENSDARG0	641324	ensembl_ge	D. rerio	641324	D. rerio	ube2v1	ubiquitin-c	GO:0070534	protein K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	ENSDARG0	563776	ensembl_ge	D. rerio	563776	D. rerio	deaf1	DEAF1 tran	GO:0006357	regulatio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	ENSDARG00000117419						None	None	None	None	nan	nan	nan	nan	nan	nan	nan	nan	nan

Check if ‘metascape_result.xlsx’ file is included
We need this file for further analysis of RNA-Seq