

Figure S1. User Interface

AtlasAI deployed as an integrated sidebar on the Human Protein Atlas website, streaming all reasoning steps in real time. (A) Deep Research panel displaying the complete auditable trace for "Find kinases enriched in brain tissue but not secreted to blood": goal parsing, field and class selection with available options shown, subclass selection, trail navigation through the HPA schema, URL construction, semantic validation (PASS), and final results (8 kinases). (B) Investigator panel showing autonomous gene exploration for "Is ABCB11 cancer prognostic": gene resolution, page selection, HTML download (308KB), chart and table extraction (5 charts, 7 tables), evidence observation, value identification with source section, reasoning chain, validation (3/3 checks passed, HIGH confidence), and grounded answer with citations.

A

Find kinases enriched in brain tissue but not secreted to blood

12:18 AM

I will start by searching for kinases that are enriched in brain tissue and then filter out those that are secreted to blood.

12:18 AM

Deep Research complete ▾

Thinking in choice... + deep_research_hpa

THINK Field Options

Analyzing options... + deep_research_hpa

SELECT Field

Analyzing options... + deep_research_hpa

THINK Class Options

Analyzing options... + deep_research_hpa

SELECT Class

Analyzing options... + deep_research_hpa

RUN Path

Executing query... + deep_research_hpa

PLAN Axis Built

Building search strategy... + deep_research_hpa

THINK Subclass Options

Analyzing options... + deep_research_hpa

SELECT Subclass

Analyzing options... + deep_research_hpa

RUN Path

Executing query... + deep_research_hpa

PLAN Axis Built

Building search strategy... + deep_research_hpa

THINK Note

Analyzing options... + deep_research_hpa

RUN Path

Executing query... + deep_research_hpa

PLAN Axis Built

Building search strategy... + deep_research_hpa

PLAN Validation

Building search strategy... + deep_research_hpa

RUN Url Ready

Executing query... + deep_research_hpa

PLAN Validate

Building search strategy... + deep_research_hpa

DONE Valid

Research complete... + deep_research_hpa

PLAN Search

Executing compound query

I found 8 kinases enriched in brain tissue that are not secreted to blood. The results match the exact search criteria provided.

12:19 AM

Filter 8 genes...

GENE	TISSUE	BRAIN	SINGLE CELL	SUBCELL	CANCER	BLOOD	CELL LINE	STRUCTURE
CAMKK2 <small>ENSG00000109131</small> Calcium/calmodulin dependent protein kinase kinase 2								
CAMKV <small>ENSG00000144876</small> CaM kinase like vesicle associated								
EPHA5 <small>ENSG00000145242</small> EPH receptor A5								
FGFR2 <small>ENSG00000024248</small> Fibroblast growth factor receptor 2								
HRK2 <small>ENSG00000146393</small> Homeodomain interacting protein kinase 2								

Prev 1 / 2 Next

B

Is ABCB11 cancer prognostic

12:26 AM

I will look up detailed information about the prognostic value of ABCB11 in cancer.

12:26 AM

Investigator complete ▾

START Investigating Gene

Resolving gene in HPA...

Research agent activated... + investigator_hpa

SELECT Resolved

Analyzing options... + investigator_hpa

LOCKING IN CHOICE... + investigator_hpa

PLAN Selecting

Determining which pages to fetch...

Building search strategy... + investigator_hpa

PLAN Pages

cancer

Building search strategy... + investigator_hpa

INFO Page Select

297 (255 in + 42 out)

investigator_hpa

RUN Fetching

cancer

Executing query... + investigator_hpa

INFO Downloaded

308KB HTML

Status update... + investigator_hpa

INFO Charts

5 found

Status update... + investigator_hpa

INFO Tables

7 found

Status update... + investigator_hpa

INFO Analyzing

11.8KB data, 7 tables

Status update... + investigator_hpa

INFO Observed

The CHART DATA section explicitly states: "Liver Hepatocellular Carcinoma - Potential prognostic - favorable; present."

Status update... + investigator_hpa

INFO Observed

The PROGNOSTIC SUMMARY section confirms ABCB11 as a prognostic marker with Kaplan-Meier plots for cancers where high expression is significantly associated with survival.

Status update... + investigator_hpa

INFO Observed

No other cancers are mentioned as prognostic for ABCB11 in the extracted data.

Status update... + investigator_hpa

INFO Value Found

Liver Hepatocellular Carcinoma - Potential prognostic - favorable

Status update... + investigator_hpa

INFO From Section

CANCER PAGE - CHART DATA and PROGNOSTIC SUMMARY

Status update... + investigator_hpa

INFO Logic

The data explicitly states ABCB11 is a prognostic marker in liver hepatocellular carcinoma with a favorable prognosis, directly answering the question about cancer prognostic status.

Status update... + investigator_hpa

INFO Reasoning

4839 (4582 in + 257 out)

investigator_hpa

INFO Total

5136 (4837 in + 299 out)

investigator_hpa

INFO Checking

Validating answer quality...

Status update... + investigator_hpa

INFO Answer Found

Status update... + investigator_hpa

INFO Source Identified

CANCER PAGE - CHART DATA and PROGNOSTIC SUMMARY

Status update... + investigator_hpa

INFO Confidence

HIGH

Status update... + investigator_hpa

INFO Result

3/3 checks passed

Status update... + investigator_hpa

Here's what I found about ABCB11:

ABCB11 is a prognostic marker in Liver Hepatocellular Carcinoma with a potential favorable prognosis.

This is based on data that explicitly states ABCB11 is a prognostic marker in liver hepatocellular carcinoma with a favorable prognosis. The CHART DATA section explicitly states: "Liver Hepatocellular Carcinoma - Potential prognostic - favorable; present." The PROGNOSTIC SUMMARY section confirms ABCB11 as a prognostic marker with Kaplan-Meier plots for cancers where high expression is significantly associated with survival. No other cancers are mentioned as prognostic for ABCB11 in the extracted data.

12:26 AM

Table S1. 17-Query Curated Benchmark Results

Ground truth established through expert manual navigation by three researchers with extensive HPA experience. Accuracy scored as correct if system outputs matched ground truth URLs (searches) or returned accurate values with valid citations (investigations).

#	CATEGORY	QUERY	RESULT	STEPS	TIME (S)	ATTEMPTS
1	Simple	Find all proteases	Correct	9	11.8	1
2	Simple	Show me voltage-gated ion channels	Correct	11	12.3	1
3	Simple	Find all kinases	Correct	9	11.2	1
4	Compound	Transcription factors enriched in testis	Correct	18	13.8	1
5	Compound	Membrane receptors highly expressed in brain	Correct	21	14.7	2 (recovered)
6	Compound	Liver-enriched secreted proteins	Correct	23	15.1	2 (recovered)
7	Compound	Kidney enriched NOT liver	Correct	18	13.2	1
8	Exclusion	Kinases not expressed in heart tissue	Correct	26	17.3	2 (recovered)
9	Exclusion	Receptors enriched in lung but absent from liver	Correct	28	18.9	2 (recovered)
10	Exclusion	Proteins not secreted to blood	Correct	22	15.8	1
11	Exclusion	Cancer-associated transporters not in normal colon	Correct	24	16.1	1
12	Investigation	What tissues express EGFR?	Correct	11	7.2	1
13	Investigation	How many protein interactions does EGFR have?	Correct	16	9.4	1
14	Investigation	Is MYC prognostic in any cancer type?	Correct	19	11.8	1
15	Investigation	What is the subcellular location of TP53?	Correct	14	8.6	1
16	Education	What IHC markers diagnose melanoma?	Correct	8	5.4	1
17	Education	Show normal liver histology	Correct	6	4.2	1
Accuracy: 17/17 (100%)						4 queries required validation recovery

Table S2. Time Efficiency: Manual Expert vs. AtlasAI

Manual times measured with three expert users familiar with HPA structure (median of 5 trials each). "Manual Clicks" indicates discrete interface actions. "Agent Steps" indicates logged reasoning operations.

QUERY	CATEGORY	MANUAL (S)	ATLASAI (S)	SPEEDUP	CLICKS	STEPS
Find all proteases	Simple	34	11.8	2.9x	4	9
Voltage-gated ion channels	Simple	41	12.3	3.3x	5	11
TFs enriched in testis	Compound	118	13.8	8.6x	9	18
Membrane receptors in brain	Compound	134	14.7	9.1x	11	21
Liver-enriched secreted proteins	Compound	142	15.1	9.4x	12	23
Kinases not in heart	Exclusion	167	17.3	9.7x	14	26
Receptors in lung not liver	Exclusion	189	18.9	10.0x	18	28
What tissues express EGFR?	Investigation	38	7.2	5.3x	3	11
EGFR protein interactions	Investigation	52	9.4	5.5x	4	16
Is MYC prognostic?	Investigation	68	11.8	5.8x	6	19

Summary by Category

CATEGORY	MEAN MANUAL (S)	MEAN ATLASAI (S)	MEAN SPEEDUP
Simple	37.5	12.1	3.1x
Compound	131.3	14.5	9.0x
Exclusion	178.0	18.1	9.8x
Investigation	52.7	9.5	5.5x

Speedup increases with query complexity due to compounding navigation overhead in manual approach.

Benchmark Protocol for Frontier Language Model Comparison

Prompting setup. All 30 queries were presented to each model in separate independent sessions. The prompt identified the Human Protein Atlas (proteintlas.org) as the authoritative data source and instructed each model to provide the complete list of matching genes, the count, and a confidence level for each query. No HPA schema information, URL syntax, or worked examples were provided. All models had web browsing enabled at the time of evaluation. Baseline models were evaluated without access to the HPA schema, reflecting standard usage without task-specific system integration.

Model configurations. Six configurations were tested: Claude Opus 4.6 with extended thinking (Anthropic, \$5.00/\$25.00 per 1M input/output tokens), Gemini 3.1 Pro with thinking (Google, \$2.00/\$12.00), GPT-5.4 at high reasoning effort (\$2.50/\$15.00), GPT-5.4 at medium reasoning effort (\$2.50/\$15.00), GPT-5.4 with no reasoning (\$2.50/\$15.00), and GPT-4.1 with no reasoning (OpenAI, \$2.00/\$8.00). AtlasAI uses GPT-4.1 mini (\$0.40/\$1.60) as its backbone model. All pricing as of March 2026.

Retries and reformulation. No retries were permitted. Each model received one attempt per query. Models were free to use web browsing, search, and any other tools available in their standard configuration. No time limit was imposed; models were allowed to run until they produced a final answer or explicitly declined.

Definition of "Refused." A model was scored as "Refused" when it explicitly stated that it could not reliably complete the task. In practice, Claude Opus 4.6 and GPT-5.4 attempted to access HPA through web browsing, tried multiple strategies (direct page fetching, API endpoints, bulk data downloads), and after failing to navigate the search system, returned a statement declining to provide answers rather than risk fabrication. This behavior was consistent across all three GPT-5.4 reasoning levels.

Correctness threshold. A model's reported gene count was scored as correct if it fell within 10% of the ground truth count (verified against live HPA search results). For queries returning zero results, any non-zero answer was scored as incorrect.

Atlas Cost Index (ACI). ACI was computed as the estimated API cost per query for each model divided by the AtlasAI cost per query. Token consumption was estimated at 80,000 to 120,000 tokens per model based on observed prompt lengths, browsing overhead, and reasoning token generation. AtlasAI cost was computed from its average token consumption (~7,500 tokens) at GPT-4.1 mini rates.

Table S3. Full 30-Query LLM Comparison

Extended version of Figure 2A. All models given web browsing access. Correctness threshold: ±10% of actual count. ACI = Atlas Cost Index (API cost relative to AtlasAI baseline).

#	QUERY	TRUTH	ATLASAI	CLAUDE 4.6	GEMINI 3.1 PRO	GPT-5.4 HIGH	GPT-5.4 MED	GPT-5.4	GPT-4.1
1	Prognostic markers in melanoma	254	254 ✓	Refused	>1500 ✗	Refused	Refused	Refused	Refused
2	Proteins specific to placenta, secreted to blood	10	10 ✓	Refused	~25 ✗	Refused	Refused	Refused	Refused
3	Metabolic proteins enriched only in liver	107	107 ✓	Refused	~175 ✗	Refused	Refused	Refused	Refused
4	Fibroblast enriched predicted secreted proteins	5	5 ✓	Refused	~60 ✗	Refused	Refused	Refused	Refused
5	Predicted secreted proteins in pituitary	12	12 ✓	Refused	~20 ✗	Refused	Refused	Refused	Refused
6	Kinases in thyroid, not secreted to blood	0	0 ✓	Refused	0 ✓	Refused	Refused	Refused	Refused
7	Nuclear proteins in testis, not in liver	188	188 ✓	Refused	~400 ✗	Refused	Refused	Refused	Refused
8	Hepatocyte kinases, secreted to blood	0	0 ✓	Refused	0 ✓	Refused	Refused	Refused	Refused
9	Cardiomyocyte enzymes, not secreted	3	3 ✓	Refused	~30 ✗	Refused	Refused	Refused	Refused
10	Enzymes in hypothalamus, not secreted	1	1 ✓	Refused	<5 ✗	Refused	Refused	Refused	Refused
11	Peroxisome proteins in liver, not kidney	0	0 ✓	Refused	1-3 ✗	Refused	Refused	Refused	Refused
12	Mitochondrial kinases in heart	0	0 ✓	Refused	1 ✗	Refused	Refused	Refused	Refused
13	Proteases in pancreas, secreted digestive	14	14 ✓	Refused	~15 ✓	Refused	Refused	Refused	Refused
14	Cell junction proteins in colon, not liver	1	1 ✓	Refused	~10 ✗	Refused	Refused	Refused	Refused
15	Lysosome proteins in spleen, not brain	0	0 ✓	Refused	~5 ✗	Refused	Refused	Refused	Refused
16	FDA kinases in brain, not liver	2	2 ✓	Refused	1-2 ✓	Refused	Refused	Refused	Refused
17	CD markers in T-cells, not B/NK-cells	25	25 ✓	Refused	6 ✗	Refused	Refused	Refused	Refused
18	Enzymes in stomach, absent liver/pancreas	1	1 ✓	Refused	~8 ✗	Refused	Refused	Refused	Refused
19	Cancer metabolic proteins in liver, not kidney	7	7 ✓	Refused	~2 ✗	Refused	Refused	Refused	Refused
20	Metabolic enzymes in cerebellum, not cortex	6	6 ✓	Refused	0 ✗	Refused	Refused	Refused	Refused
21	Kinases in thalamus, not hypothalamus/cortex	0	0 ✓	Refused	0 ✓	Refused	Refused	Refused	Refused
22	FDA membrane proteins in brain, not secreted	40	40 ✓	Refused	~45 ✓	Refused	Refused	Refused	Refused
23	Cancer transporters in brain, not liver	3	3 ✓	Refused	<5 ✗	Refused	Refused	Refused	Refused
24	Peptidases in stomach, not liver/brain, not secreted	2	2 ✓	Refused	4 ✗	Refused	Refused	Refused	Refused
25	Kinases in retina, not cortex/liver, not secreted	4	4 ✓	Refused	2 ✗	Refused	Refused	Refused	Refused
26	Cancer transporters in liver, not kidney/brain, not secreted	0	0 ✓	Refused	1-2 ✗	Refused	Refused	Refused	Refused
27	TFs in testis, not brain/liver/ovary/prostate	24	24 ✓	Refused	1-3 ✗	Refused	Refused	Refused	Refused
28	Kinases in brain, not liver/heart/kidney, not secreted	4	4 ✓	Refused	~5 ✗	Refused	Refused	Refused	Refused
29	Enzymes in hepatocytes, not brain/kidney, not secreted	14	14 ✓	Refused	~10 ✗	Refused	Refused	Refused	Refused
30	FDA targets in brain, not liver/kidney/heart, not secreted	31	31 ✓	Refused	~17 ✗	Refused	Refused	Refused	Refused

"Refused" = model attempted to access HPA through web browsing but could not navigate the search system and explicitly declined to provide answers. Gemini 3.1 Pro hallucinated gene counts for 4 queries where HPA returns 0 results. API pricing as of March 2026.

Accuracy Summary

MODEL	REASONING	ACCURACY	ACI	\$/QUERY
AtlasAI (GPT-4.1 mini)	5-stage pipeline	100% (30/30)	1.0x	\$0.005
Claude Opus 4.6	Extended	0% (0/30)	240x	\$1.20
Gemini 3.1 Pro	Thinking	20% (6/30)	86x	\$0.43
GPT-5.4	High	0% (0/30)	124x	\$0.62
GPT-5.4	Medium	0% (0/30)	78x	\$0.39
GPT-5.4	None	0% (0/30)	56x	\$0.28

Table S4. Extended 236-Query Deep Research Benchmark (full results)

All queries verified against live HPA search results. Individual execution logs for all 236 queries available in supplementary data archive.

Summary

TIER	CONSTRAINTS	COUNT	AVG TIME (S)	FIRST ATTEMPT
1-axis	1	9	12.5	100%
2-axis	2	28	11.4	96%
3-axis	3	130	13.2	95%
4-axis	4	32	16.7	94%
5+ axis	5-6	37	16.0	95%
Total		236	13.9	95.8%

77% of queries include at least one exclusion constraint. All 236 correct URLs verified against live HPA.

Per-Query Results

#	AXES	QUERY	GENES	TIME (S)	ATT.	URL
1	5	Peptidases enriched in stomach not detected in liver or brain and not secreted to blood	2	14.7	1	protein_class:Enzymes:Peptidases+AND+tissue_category_rna:Stomach:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Brain:Not+detected+NOT+sa_location:Secreted+to+blood
2	5	Transcription factors enriched in cerebral cortex not in cerebellum not in liver and not in kidney	1	15.1	1	protein_class:Transcription+factors+AND+brain_category_rna:Cerebral+cortex:Region+enriched+AND+brain_category_rna:Cerebellum:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected
3	5	Predicted secreted proteins enriched in placenta not in ovary not in testis and secreted to blood	6	14.8	1	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Placenta:Tissue+enriched+AND+tissue_category_rna:Ovary:Not+detected+AND+tissue_category_rna:Testis:Not+detected+AND+sa_location:Secreted+to+blood
4	5	Enzymes enriched in adrenal gland not in kidney not in liver and not secreted to extracellular matrix	2	14.2	1	protein_class:Enzymes+AND+tissue_category_rna:Adrenal:gland:Tissue+enriched+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Liver:Not+detected+NOT+sa_location:Secreted+to+extracellular+matrix
5	5	CD markers enriched in spleen not in brain not in testis and not in liver	13	14.5	1	protein_class:CD+markers+AND+tissue_category_rna:Lymphoid:Tissue+enriched+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Testis:Not+detected+AND+tissue_category_rna:Liver:Not+detected
6	5	Kinases enriched in retina not in cerebral cortex not in liver and not secreted to blood	4	15.8	1	protein_class:Enzymes:Kinases+AND+tissue_category_rna:Retina:Tissue+enriched+AND+brain_category_rna:Cerebral+cortex:Not+detected+AND+tissue_category_rna:Liver:Not+detected+NOT+sa_location:Secreted+to+blood
7	5	Transporters enriched in colon not in small intestine not in stomach and not in liver	46	46.5	4	protein_class:Transporters+AND+ce_enriched:Colon:Colon+enterocytes,Colon+enteroendocrine+cells,Mitotic+cells+(Colon)+AND+tissue_category_rna:Intestine:Not+detected+AND+tissue_category_rna:Stomach:Not+detected+AND+tissue_category_rna:Liver:Not+detected
8	5	Nuclear receptors enriched in liver not in kidney not in adrenal gland and not in brain	0	14.4	1	protein_class:Nuclear+receptors+AND+tissue_category_rna:Liver:Tissue+enriched+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Adrenal:gland:Not+detected+AND+tissue_category_rna:Brain:Not+detected
9	5	Metabolic proteins enriched in skeletal muscle not in heart muscle not in brain and not in liver	1	12.9	1	protein_class:Metabolic+proteins+AND+tissue_category_rna:Skeletal+muscle:Tissue+enriched+AND+tissue_category_rna:Heart+muscle:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Liver:Not+detected
10	5	Ribosomal proteins enriched in testis not in ovary not in brain and not in bone marrow	1	14.3	1	protein_class:Ribosomal+proteins+AND+tissue_category_rna:Testis:Tissue+enriched+AND+tissue_category_rna:Ovary:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Bone+marrow:Not+detected
11	5	Predicted membrane proteins enriched in lung not in heart not in brain and not secreted to blood	4	16.4	1	protein_class:Predicted+membrane+proteins+AND+tissue_category_rna:Lung:Tissue+enriched+AND+tissue_category_rna:Heart+muscle:Not+detected+AND+tissue_category_rna:Brain:Not+detected+NOT+sa_location:Secreted+to+blood
12	5	FDA approved drug targets enriched in kidney not in liver not in brain and not in heart	10	13.9	1	protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Kidney:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched+NOT+tissue_category_rna:Brain:Tissue+enriched+NOT+tissue_category_rna:Heart+muscle:Tissue+enriched
13	5	Cancer-related genes enriched in testis not in ovary not in brain and secreted to blood	2	13.7	1	protein_class:Cancer-related+genes+AND+tissue_category_rna:Testis:Tissue+enriched+AND+tissue_category_rna:Ovary:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+sa_location:Secreted+to+blood
14	4	Voltage-gated ion channels enriched in brain not in heart not in skeletal muscle	19	13.9	1	protein_class:Voltage-gated+ion+channels+AND+tissue_category_rna:Brain:Tissue+enriched+AND+tissue_category_rna:Heart+muscle:Not+detected+AND+tissue_category_rna:Skeletal+muscle:Not+detected
15	5	Plasma proteins enriched in liver not in kidney not in brain and secreted to blood	37	14.8	1	protein_class:Plasma+proteins+AND+tissue_category_rna:Liver:Tissue+enriched+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+sa_location:Secreted+to+blood
16	5	Proteases enriched in stomach not in pancreas not in liver and not in kidney	0	13.7	1	protein_class:Enzymes:Peptidases+AND+tissue_category_rna:Stomach:Tissue+enriched+AND+tissue_category_rna:Pancreas:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected
17	5	Immunoglobulin genes enriched in bone marrow not in liver not in brain and not in testis	0	15.4	1	protein_class:Immunoglobulin+genes+AND+tissue_category_rna:Bone+marrow:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Testis:Not+detected
18	5	RAS pathway proteins enriched in brain not in liver not in kidney and not in heart	6	15.7	1	protein_class:RAS+pathway+related+proteins+AND+tissue_category_rna:Brain:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Heart+muscle:Not+detected
19	5	Enzymes enriched in thyroid gland not in parathyroid gland not in adrenal gland and not in liver	1	15.0	1	protein_class:Enzymes+AND+tissue_category_rna:Thyroid:gland:Tissue+enriched+AND+tissue_category_rna:Parathyroid:gland:Not+detected+AND+tissue_category_rna:Adrenal:gland:Not+detected+AND+tissue_category_rna:Liver:Not+detected
20	4	Transporters enriched in proximal tubule cells not in liver and not secreted to blood	0	15.0	1	protein_class:Transporters+AND+cell_type_category_rna:Proximal+tubular+cells:Cell+type+enriched+AND+tissue_category_rna:Liver:Not+detected+NOT+sa_location:Secreted+to+blood
21	5	Kinases enriched in hippocampal formation not in cerebellum not in liver and not in kidney	0	16.0	1	protein_class:Enzymes:Kinases+AND+brain_category_rna:Hippocampal+formation:Region+enriched+AND+brain_category_rna:Cerebellum:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected
22	6	Transcription factors enriched in testis not in brain not in liver not in ovary and not in prostate	24	15.6	1	protein_class:Transcription+factors+AND+tissue_category_rna:Testis:Tissue+enriched+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Ovary:Not+detected+AND+tissue_category_rna:Prostate:Not+detected
23	5	Predicted intracellular proteins enriched in retina not in brain not in liver and not in kidney	42	14.7	1	protein_class:Predicted+intracellular+proteins+AND+tissue_category_rna:Retina:Tissue+enriched+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected

#	AXES	QUERY	GENES	TIME (S)	ATT.	URL
24	6	Cancer-related transporters enriched in liver not in kidney not in brain and not secreted to blood	0	16.0	1	protein_class:Transporters+AND+protein_class:Cancer-related+genes+AND+tissue_category_rna:Liver;Tissue+enriched+AND+tissue_category_rna:Kidney;Not+detected+AND+tissue_category_rna:Brain;Not+detected+NOT+sa_location:Secreted+to+blood
25	5	Enzymes enriched in salivary gland not in pancreas not in stomach and not in liver	1	14.8	1	protein_class:Enzymes+AND+tissue_category_rna:Salivary+gland;Tissue+enriched+AND+tissue_category_rna:Pancreas;Not+detected+AND+tissue_category_rna:Stomach;Not+detected+AND+tissue_category_rna:Liver;Not+detected
26	5	Membrane proteins enriched in cerebellum not in cerebral cortex not in liver and not in heart	26	14.8	1	protein_class:Predicted+membrane+proteins+AND+brain_category_rna:Cerebellum;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched+NOT+tissue_category_rna:Heart+muscle;Tissue+enriched
27	5	Metabolic proteins enriched in liver not in kidney not in skeletal muscle and not in heart muscle	37	14.4	1	protein_class:Metabolic+proteins+AND+tissue_category_rna:Liver;Tissue+enriched+AND+tissue_category_rna:Kidney;Not+detected+AND+tissue_category_rna:Skeletal+muscle;Not+detected+AND+tissue_category_rna:Heart+muscle;Not+detected
28	5	Predicted secreted proteins enriched in breast not in placenta not in ovary and not secreted to blood	6	15.8	1	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Breast;Tissue+enriched+NOT+tissue_category_rna:Placenta;Tissue+enriched+NOT+tissue_category_rna:Ovary;Tissue+enriched+Group+enriched+NOT+sa_location:Secreted+to+blood
29	5	Nuclear receptors enriched in prostate not in testis not in liver and not in brain	0	13.0	1	protein_class:Nuclear+receptors+AND+tissue_category_rna:Prostate;Tissue+enriched+NOT+tissue_category_rna:Testis;Tissue+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched+NOT+tissue_category_rna:Brain;Tissue+enriched
30	3	Kinases enriched in thyroid gland not secreted to blood	0	12.7	1	protein_class:Enzymes;Kinases+AND+tissue_category_rna:Thyroid+gland;Tissue+enriched+NOT+sa_location:Secreted+to+blood
31	3	Enzymes enriched in epididymis not detected in ovary	4	12.7	1	protein_class:Enzymes+AND+tissue_category_rna:Epididymis;Tissue+enriched+AND+tissue_category_rna:Ovary;Not+detected
32	3	Transporters enriched in colon absent from small intestine	55	42.1	4	protein_class:Transporters+AND+ce_enriched:Colon;Colon+enterocytes;Colon+enteroendocrine+cells;Mitotic+cells+(Colon)+AND+tissue_category_rna:Intestine;Not+detected
33	3	CD markers enriched in spleen not detected in testis	25	13.2	1	protein_class:CD+markers+AND+tissue_category_rna:Lymphoid;tissue;Tissue+enriched+AND+tissue_category_rna:Testis;Not+detected
34	3	Transcription factors enriched in adrenal gland not in kidney	2	12.4	1	protein_class:Transcription+factors+AND+tissue_category_rna:Adrenal+gland;Tissue+enriched+NOT+tissue_category_rna:Kidney;Tissue+enriched
35	3	Nuclear receptors enriched in prostate not in testis	0	12.1	1	protein_class:Nuclear+receptors+AND+tissue_category_rna:Prostate;Tissue+enriched+NOT+tissue_category_rna:Testis;Tissue+enriched
36	3	Predicted membrane proteins enriched in retina not in brain	45	12.2	1	protein_class:Predicted+membrane+proteins+AND+tissue_category_rna:Retina;Tissue+enriched+NOT+tissue_category_rna:Brain;Tissue+enriched
37	3	Ribosomal proteins enriched in lymphoid tissue not in testis	0	13.2	1	protein_class:Ribosomal+proteins+AND+tissue_category_rna:Lymphoid;tissue;Tissue+enriched+AND+tissue_category_rna:Testis;Not+detected
38	3	Metabolic proteins enriched in thyroid gland not in liver	3	12.9	1	protein_class:Metabolic+proteins+AND+tissue_category_rna:Thyroid+gland;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
39	4	Plasma proteins enriched in placenta secreted to blood	4	47.0	4	protein_class:Plasma+proteins+AND+tissue_category_rna:Placenta;Tissue+enriched+AND+sa_location:Secreted+to+blood+NOT+tissue_category_rna:Bone+marrow;Tissue+enriched
40	3	Proteases enriched in skin not in liver	2	13.1	1	protein_class:Enzymes;Peptidases+AND+tissue_category_rna:Skin;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
41	3	FDA drug targets enriched in heart muscle not in brain	3	12.1	1	protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Heart+muscle;Tissue+enriched+NOT+tissue_category_rna:Brain;Tissue+enriched
42	4	Cancer-related kinases enriched in kidney not in liver	0	13.0	1	protein_class:Enzymes;Kinases+AND+protein_class:Cancer-related+genes+AND+tissue_category_rna:Kidney;Tissue+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched
43	3	Immunoglobulin genes enriched in spleen not in liver	8	13.9	1	protein_class:Immunoglobulin+genes+AND+tissue_category_rna:Lymphoid;tissue;Tissue+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched
44	3	Voltage-gated ion channels enriched in heart not in brain	1	14.0	1	protein_class:Voltage-gated+ion+channels+AND+tissue_category_rna:Heart+muscle;Tissue+enriched+AND+tissue_category_rna:Brain;Not+detected
45	3	RAS pathway proteins enriched in pancreas not in liver	0	13.5	1	protein_class:RAS+pathway+related+proteins+AND+tissue_category_rna:Pancreas;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
46	3	Predicted intracellular proteins enriched in cerebellum not in liver	30	12.2	1	protein_class:Predicted+intracellular+proteins+AND+brain_category_rna:Cerebellum;Region+enriched+AND+tissue_category_rna:Liver;Not+detected
47	3	Enzymes enriched in gallbladder not secreted to blood	1	12.4	1	protein_class:Enzymes+AND+tissue_category_rna:Gallbladder;Tissue+enriched+NOT+sa_location:Secreted+to+blood
48	3	Transporters enriched in salivary gland not in stomach	5	12.1	1	protein_class:Transporters+AND+tissue_category_rna:Salivary+gland;Tissue+enriched+AND+tissue_category_rna:Stomach;Not+detected
49	3	Kinases enriched in bone marrow not in liver	0	13.2	1	protein_class:Enzymes;Kinases+AND+tissue_category_rna:Bone+marrow;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
50	3	CD markers enriched in thymus not in bone marrow	9	12.1	1	protein_class:CD+markers+AND+tissue_category_rna:Lymphoid;tissue;Tissue+enriched+AND+tissue_category_rna:Bone+marrow;Not+detected
51	3	Transcription factors enriched in retina not in liver	6	12.3	1	protein_class:Transcription+factors+AND+tissue_category_rna:Retina;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
52	3	Membrane proteins enriched in tongue not in esophagus	1	15.3	1	protein_class:Predicted+membrane+proteins+AND+tissue_category_rna:Tongue;Tissue+enriched+NOT+tissue_category_rna:Esophagus;Tissue+enriched
53	4	Predicted secreted proteins enriched in stomach secreted to digestive system	12	38.5	2	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Stomach;Tissue+enriched+AND+sa_location:Secreted+to+digestive+system+NOT+tissue_category_rna:Adipose+tissue;Adrenal+gland;Bone+marrow;Breast;Cervix;Endometrium;Epididymis;Esophagus;Fallopian+tube;Gallbladder;Intestine;Kidney;Liver;Lung;Lymphoid+tissue;Ovary;Pancreas;Parathyroid+gland;Pituitary+gland;Placenta;Prostate;Retina;Tissue+enriched
54	3	Kinases enriched in smooth muscle not in heart	0	12.4	1	protein_class:Enzymes;Kinases+AND+tissue_category_rna:Smooth+muscle;Tissue+enriched+NOT+tissue_category_rna:Heart+muscle;Tissue+enriched
55	3	Transporters enriched in rectum not in colon	0	25.9	2	protein_class:Transporters+AND+normal_expression:Rectum;glandular+cells+NOT+ce_enriched:Colon;Colon+enterocytes;Colon+enteroendocrine+cells;Mitotic+cells+(Colon)
56	3	Nuclear receptors enriched in adrenal gland not secreted to blood	0	12.1	1	protein_class:Nuclear+receptors+AND+tissue_category_rna:Adrenal+gland;Tissue+enriched+NOT+sa_location:Secreted+to+blood
57	3	Cancer-related genes enriched in prostate not in testis	8	13.0	1	protein_class:Cancer-related+genes+AND+tissue_category_rna:Prostate;Tissue+enriched+NOT+tissue_category_rna:Testis;Tissue+enriched
58	4	Metabolic enzymes enriched in kidney not secreted to blood	4	15.1	1	protein_class:Enzymes+AND+protein_class:Metabolic+proteins+AND+tissue_category_rna:Kidney;Tissue+enriched+NOT+sa_location:Secreted+to+blood
59	3	Peptidases enriched in duodenum not in stomach	2	14.0	1	protein_class:Enzymes;Peptidases+AND+tissue_category_rna:Intestine;Tissue+enriched+AND+tissue_category_rna:Stomach;Not+detected
60	3	Plasma proteins enriched in spleen not in liver	7	12.3	1	protein_class:Plasma+proteins+AND+tissue_category_rna:Lymphoid;tissue;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected

#	AXES	QUERY	GENES	TIME (s)	ATT.	URL
61	3	FDA drug targets enriched in lung not in kidney	1	13.1	1	protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Lung;Tissue+enriched+AND+tissue_category_rna:Kidney;Not+detected
62	3	Predicted membrane proteins enriched in thyroid gland not in liver	5	12.9	1	protein_class:Predicted+membrane+proteins+AND+tissue_category_rna:Thyroid+gland;Tissue+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched
63	3	Transcription factors enriched in ovary not in testis	1	11.1	1	protein_class:Transcription+factors+AND+tissue_category_rna:Ovary;Tissue+enriched+NOT+tissue_category_rna:Testis;Tissue+enriched
64	4	CD markers enriched in appendix not in spleen	0	40.5	2	protein_class:CD+markers+AND+normal_expression:Appendix;lymphoid+tissue+NOT+ce_enriched:Spleen;B-cells+(Spleen);Mitotic+cells+(Spleen);NK-cells+(Spleen)+NOT+tissue_category_rna:Lymphoid+tissue;Tissue+enriched
65	3	Enzymes enriched in parathyroid gland not in thyroid gland	3	11.4	1	protein_class:Enzymes+AND+tissue_category_rna:Parathyroid+gland;Tissue+enriched+NOT+tissue_category_rna:Thyroid+gland;Tissue+enriched
66	3	Ribosomal proteins enriched in spleen not in liver	0	12.9	1	protein_class:Ribosomal+proteins+AND+tissue_category_rna:Lymphoid+tissue;Tissue+enriched+NOT+tissue_category_rna:Liver;Tissue+enriched
67	3	Transporters enriched in placenta not secreted to blood	4	11.4	1	protein_class:Transporters+AND+tissue_category_rna:Placenta;Tissue+enriched+NOT+sa_location:Secreted+to+blood
68	4	Cancer-related enzymes enriched in brain not in liver	1	13.7	1	protein_class:Enzymes+AND+protein_class:Cancer-related+genes+AND+tissue_category_rna:Brain;Tissue+enriched+AND+tissue_category_rna:Liver;Not+detected
69	3	Hepatocyte enriched kinases secreted to blood	0	14.2	1	protein_class:Enzymes;Kinases+AND+cell_type_category_rna:Hepatocytes;Cell+type+enriched+AND+sa_location:Secreted+to+blood
70	3	Neuronal cell enriched transporters not detected in liver	34	12.1	1	protein_class:Transporters+AND+cell_type_group_category_rna:Neuronal+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
71	3	Cardiomyocyte enriched enzymes not secreted to blood	3	13.2	1	protein_class:Enzymes+AND+cell_type_category_rna:Cardiomyocytes;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
72	3	T-cell enriched transcription factors not detected in brain	5	13.7	1	protein_class:Transcription+factors+AND+immune_cell_lineage_category_rna:T-cells;Lineage+enriched+AND+tissue_category_rna:Brain;Not+detected
73	3	B-cell enriched CD markers not detected in liver	3	12.0	1	protein_class:CD+markers+AND+cell_type_category_rna:B-cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
74	2	Spermatogenic cell enriched genes secreted to blood	9	12.3	1	cell_type_group_category_rna:Spermatogenic+cell+types;Cell+type+enriched+AND+sa_location:Secreted+to+blood
75	3	Glial cell enriched kinases not detected in liver	1	12.5	1	protein_class:Enzymes;Kinases+AND+cell_type_group_category_rna:Glial+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
76	2	Macrophage enriched genes enriched in spleen	0	12.2	1	cell_type_category_rna:Macrophages;Cell+type+enriched+AND+tissue_category_rna:Lymphoid+tissue;Tissue+enriched
77	3	NK-cell enriched enzymes not detected in brain	0	11.9	1	protein_class:Enzymes+AND+cell_type_category_rna:NK-cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
78	3	Dendritic cell enriched CD markers not in liver	6	12.3	1	protein_class:CD+markers+AND+immune_cell_lineage_category_rna:Dendritic+cells;Lineage+enriched+AND+tissue_category_rna:Liver;Not+detected
79	3	Oligodendrocyte enriched transporters not in kidney	1	13.1	1	protein_class:Transporters+AND+cell_type_category_rna:Oligodendrocytes;Cell+type+enriched+AND+tissue_category_rna:Kidney;Not+detected
80	2	Fibroblast enriched predicted secreted proteins	5	11.9	1	protein_class:Predicted+secreted+proteins+AND+cell_type_category_rna:Fibroblasts;Cell+type+enriched
81	3	Smooth muscle cell enriched membrane proteins not in brain	0	13.7	1	protein_class:Predicted+membrane+proteins+AND+cell_type_category_rna:Smooth+muscle+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
82	2	Goblet cell enriched proteins not in liver	12	11.6	1	cell_type_group_category_rna:Goblet+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
83	2	Leydig cell enriched genes not secreted to blood	0	11.2	1	cell_type_category_rna:Leydig+cells;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
84	3	Kupffer cell enriched enzymes enriched in liver	0	10.6	1	protein_class:Enzymes+AND+ce_enriched:Liver;Kupffer+cells+AND+tissue_category_rna:Liver;Tissue+enriched
85	3	Sertoli cell enriched transcription factors not in brain	0	12.0	1	protein_class:Transcription+factors+AND+cell_type_category_rna:Sertoli+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
86	3	Melanocyte enriched genes not in liver or kidney	4	15.2	1	cell_type_category_rna:Melanocytes;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected+AND+tissue_category_rna:Kidney;Not+detected
87	3	Astrocyte enriched kinases not detected in liver	0	15.9	1	protein_class:Enzymes;Kinases+AND+cell_type_category_rna:Astrocytes;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
88	3	Endothelial cell enriched transporters not secreted to blood	0	11.5	1	protein_class:Transporters+AND+cell_type_category_rna:Endothelial+cells;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
89	3	Trophoblast enriched genes not detected in brain or liver	4	12.7	1	cell_type_category_rna:Extravillous+trophoblasts;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected+AND+tissue_category_rna:Liver;Not+detected
90	2	Mural cell enriched predicted membrane proteins	2	11.1	1	protein_class:Predicted+membrane+proteins+AND+cell_type_group_category_rna:Mural+cells;Cell+type+enriched
91	3	Platelet enriched enzymes not in liver	0	11.9	1	cell_type_group_category_rna:Platelets;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected+AND+protein_class:Enzymes
92	2	Basal cell enriched transcription factors	0	10.1	1	protein_class:Transcription+factors+AND+cell_type_group_category_rna:Basal+cells;Cell+type+enriched
93	3	Renal nephron cell enriched transporters not secreted to blood	24	15.8	1	protein_class:Transporters+AND+cell_type_group_category_rna:Renal+nephron+cells;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
94	3	Proliferating cell enriched kinases not in brain	0	12.7	1	protein_class:Enzymes;Kinases+AND+cell_type_group_category_rna:Proliferating+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
95	2	Secretory cell enriched predicted secreted proteins	0	11.2	1	protein_class:Predicted+secreted+proteins+AND+cell_type_category_rna:Secretory+cells;Cell+type+enriched
96	2	Luminal cell enriched genes not detected in liver	3	12.0	1	cell_type_group_category_rna:Luminal+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
97	3	Acinar cell enriched enzymes not secreted to blood	19	11.8	1	protein_class:Enzymes+AND+cell_type_group_category_rna:Acinar+cells;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
98	3	Stromal cell enriched transcription factors not in brain	2	12.5	1	protein_class:Transcription+factors+AND+cell_type_group_category_rna:Stromal+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
99	2	Pancreatic endocrine cell enriched transporters	0	10.3	1	protein_class:Transporters+AND+cell_type_category_rna:Pancreatic+endocrine+cells;Cell+type+enriched

#	AXES	QUERY	GENES	TIME (S)	ATT.	URL
100	3	Enterocyte enriched enzymes not in liver	7	13.1	1	protein_class:Enzymes+AND+cell_type_group_category_rna:Enterocytes;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
101	3	Alveolar cell enriched predicted secreted proteins not secreted to blood	9	11.5	1	protein_class:Predicted+secreted+proteins+AND+cell_type_group_category_rna:Alveolar+cells;Cell+type+enriched+NOT+sa_location:Secreted+to+blood
102	2	Squamous epithelial cell enriched genes not in liver	0	10.9	1	cell_type_category_rna:Squamous+epithelial+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
103	2	Ciliated cell enriched proteins not in brain	0	11.0	1	cell_type_category_rna:Ciliated+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
104	2	Early spermatid enriched genes not in ovary	21	11.7	1	cell_type_category_rna:Early+spermatids;Cell+type+enriched+AND+tissue_category_rna:Ovary;Not+detected
105	3	Erythroid cell enriched transporters not in liver	0	12.5	1	protein_class:Transporters+AND+cell_type_category_rna:Erythroid+cells;Cell+type+enriched+AND+tissue_category_rna:Liver;Not+detected
106	2	Ionocyte enriched genes not in kidney	0	11.6	1	cell_type_category_rna:Ionocytes;Cell+type+enriched+AND+tissue_category_rna:Kidney;Not+detected
107	3	Langerhans cell enriched CD markers not in brain	0	11.4	1	protein_class:CD+markers+AND+cell_type_category_rna:Langerhans+cells;Cell+type+enriched+AND+tissue_category_rna:Brain;Not+detected
108	3	Kinases enriched in basal ganglia not in cerebellum	0	11.9	1	protein_class:Enzymes;Kinases+AND+brain_category_rna:Basal+ganglia;Region+enriched+AND+brain_category_rna:Cerebellum;Not+detected
109	3	Transporters enriched in thalamus not in cerebral cortex	0	10.8	1	protein_class:Transporters+AND+brain_category_rna:Thalamus;Region+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected
110	3	Enzymes enriched in hypothalamus not secreted to blood	1	13.4	1	protein_class:Enzymes+AND+brain_category_rna:Hypothalamus;Region+enriched+NOT+sa_location:Secreted+to+blood
111	3	Transcription factors enriched in choroid plexus not in cerebral cortex	3	12.6	1	protein_class:Transcription+factors+AND+tissue_category_rna:Choroid+plexus;Tissue+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
112	2	Predicted secreted proteins enriched in pituitary gland	12	9.8	1	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Pituitary+gland;Tissue+enriched
113	2	Nuclear receptors enriched in hippocampal formation	0	9.2	1	protein_class:Nuclear+receptors+AND+brain_category_rna:Hippocampal+formation;Region+enriched
114	3	CD markers expressed in cerebellum not in cerebral cortex	5	12.1	1	protein_class:CD+markers+AND+brain_category_rna:Cerebellum;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+brain_category_rna:Cerebral+cortex;Not+detected
115	2	Cancer-related genes enriched in pons	0	10.5	1	protein_class:Cancer+related+genes+AND+brain_category_rna:Pons;Region+enriched
116	3	Membrane proteins enriched in white matter not in cerebral cortex	0	13.8	1	protein_class:Predicted+membrane+proteins+AND+brain_category_rna:White+matter;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
117	3	Kinases enriched in olfactory bulb not in cerebral cortex	0	13.5	1	protein_class:Enzymes;Kinases+AND+mouse_brain_category_rna:Olfactory+bulb;Region+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected
118	3	Enzymes enriched in substantia nigra not in cerebellum	0	12.3	1	protein_class:Enzymes+AND+normal_expression:Substantia+nigra;neuronals+cells+AND+brain_category_rna:Cerebellum;Not+detected
119	3	Transporters enriched in caudate nucleus not in cerebral cortex	0	12.2	1	protein_class:Transporters+AND+brain_category_rna:Basal+ganglia;Region+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected
120	3	Transcription factors enriched in putamen not in cerebral cortex	1	12.0	1	protein_class:Transcription+factors+AND+brain_category_rna:Basal+ganglia;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
121	3	Predicted membrane proteins enriched in spinal cord not in cerebral cortex	0	10.7	1	protein_class:Predicted+membrane+proteins+AND+brain_category_rna:Spinal+cord;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
122	3	Ribosomal proteins enriched in retina not in cerebral cortex	0	10.7	1	protein_class:Ribosomal+proteins+AND+tissue_category_rna:Retina;Tissue+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected
123	3	Plasma proteins expressed in choroid plexus secreted to blood	238	12.5	1	protein_class:Plasma+proteins+AND+tissue_category_rna:Choroid+plexus;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+sa_location:Secreted+to+blood
124	3	FDA drug targets enriched in cerebellum not in cerebral cortex	6	12.5	1	protein_class:FDA+approved+drug+targets+AND+brain_category_rna:Cerebellum;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
125	3	Kinases enriched in amygdala not in hippocampal formation	0	13.5	1	protein_class:Enzymes;Kinases+AND+brain_category_rna:Amygdala;Region+enriched+NOT+brain_category_rna:Hippocampal+formation;Region+enriched
126	4	Enzymes enriched in hypothalamus not in thalamus and not in cerebral cortex	0	13.5	1	protein_class:Enzymes+AND+brain_category_rna:Hypothalamus;Region+enriched+AND+brain_category_rna:Thalamus;Not+detected+AND+brain_category_rna:Cerebral+cortex;Not+detected
127	3	Transporters enriched in medulla oblongata not in pons	0	10.7	1	protein_class:Transporters+AND+brain_category_rna:Medulla+oblongata;Region+enriched+NOT+brain_category_rna:Pons;Region+enriched
128	3	Cancer-related kinases enriched in cerebral cortex	0	13.3	1	protein_class:Enzymes;Kinases+AND+protein_class:Cancer+related+genes+AND+brain_category_rna:Cerebral+cortex;Region+enriched
129	3	Predicted secreted proteins enriched in pituitary gland secreted to blood	9	12.8	1	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Pituitary+gland;Tissue+enriched+AND+sa_location:Secreted+to+blood
130	3	Nuclear receptors enriched in hypothalamus not in cerebral cortex	3	12.8	1	protein_class:Nuclear+receptors+AND+brain_category_rna:Hypothalamus;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
131	2	Membrane proteins enriched in globus pallidus	5	12.2	1	protein_class:Predicted+membrane+proteins+AND+brain_category_rna:Basal+ganglia;Region+enriched
132	4	Metabolic enzymes enriched in cerebellum not in cerebral cortex	6	13.5	1	protein_class:Enzymes+AND+protein_class:Metabolic+proteins+AND+brain_category_rna:Cerebellum;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
133	3	Transcription factors enriched in hippocampal formation not in amygdala	0	10.9	1	protein_class:Transcription+factors+AND+brain_category_rna:Hippocampal+formation;Region+enriched+AND+brain_category_rna:Amygdala;Not+detected
134	4	Kinases enriched in thalamus not in hypothalamus and not in cerebral cortex	0	14.2	1	protein_class:Enzymes;Kinases+AND+brain_category_rna:Thalamus;Region+enriched+NOT+brain_category_rna:Hypothalamus;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched
135	4	Enzymes enriched in spinal cord not in cerebral cortex and not in cerebellum	0	13.3	1	protein_class:Enzymes+AND+brain_category_rna:Spinal+cord;Region+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched+NOT+brain_category_rna:Cerebellum;Region+enriched
136	3	Transporters enriched in midbrain not in cerebral cortex	4	11.4	1	protein_class:Transporters+AND+brain_category_rna:Midbrain;Region+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected
137	3	CD markers expressed in pons not in cerebellum	33	14.1	1	protein_class:CD+markers+AND+brain_category_rna:Pons;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+brain_category_rna:Cerebellum;Not+detected
138	4	Transcription factors enriched in caudate nucleus not in cerebral cortex and not in cerebellum	1	15.9	1	protein_class:Transcription+factors+AND+brain_category_rna:Basal+ganglia;Region+enriched+AND+brain_category_rna:Cerebral+cortex;Not+detected+AND+brain_category_rna:Cerebellum;Not+detected
139	3	Predicted membrane proteins enriched in choroid plexus not in cerebral cortex	14	12.0	1	protein_class:Predicted+membrane+proteins+AND+tissue_category_rna:Choroid+plexus;Tissue+enriched+NOT+brain_category_rna:Cerebral+cortex;Region+enriched

#	AXES	QUERY	GENES	TIME (S)	ATT.	URL
140	4	Kinases enriched in white matter not in cerebral cortex and not secreted to blood	0	13.5	1	protein_class:Enzymes+Kinases+AND+brain_category_rna:White+matter:Region+enriched+AND+brain_category_rna:Cerebral+cortex:Not+detected+NOT+sa_location:Secreted+to+blood
141	3	Nuclear receptors expressed in amygdala not in liver	10	15.0	1	protein_class:Nuclear+receptors+AND+brain_category_rna:Amygdala:Detected+in+all:Detected+in+many:Detected+in+some:Detected+in+single+AND+tissue_category_rna:Liver:Not+detected
142	4	Enzymes enriched in olfactory bulb not in cerebral cortex and not in liver	4	14.0	1	protein_class:Enzymes+AND+mouse_brain_category_rna:Olfactory+bulb:Region+enriched+AND+brain_category_rna:Cerebral+cortex:Not+detected+AND+tissue_category_rna:Liver:Not+detected
143	3	Metabolic proteins enriched in pituitary gland not in liver	0	10.9	1	protein_class:Metabolic+proteins+AND+tissue_category_rna:Pituitary+gland:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
144	4	Ribosomal proteins enriched in cerebellum not in cerebral cortex and not in liver	0	15.4	1	protein_class:Ribosomal+proteins+AND+brain_category_rna:Cerebellum:Region+enriched+NOT+brain_category_rna:Cerebral+cortex:Region+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
145	4	Cancer-related enzymes enriched in cerebral cortex not in liver	1	13.8	1	protein_class:Enzymes+AND+protein_class:Cancer+related+genes+AND+brain_category_rna:Cerebral+cortex:Region+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
146	1	Prognostic markers in melanoma	254	11.2	1	prognostic:Skin+Cutaneous+Melanoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
147	1	Prognostic markers in liver cancer	4360	14.4	1	prognostic:Liver+Hepatocellular+Carcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
148	1	Prognostic markers in lung cancer	2623	11.9	1	prognostic:Lung+Squamous+Cell+Carcinoma,Lung+Adenocarcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
149	1	Prognostic markers in colorectal cancer	608	11.1	1	prognostic:Colon+Adenocarcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
150	1	Prognostic markers in endometrial cancer	221	11.9	1	prognostic:Uterine+Corpus+Endometrial+Carcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
151	1	Prognostic markers in head and neck cancer	872	12.1	1	prognostic:Head+and+Neck+Squamous+Cell+Carcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
152	1	Prognostic markers in urothelial cancer	510	11.3	1	prognostic:Bladder+Urothelial+Carcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
153	1	Prognostic markers in cervical cancer	887	15.8	1	prognostic:Cervical+Squamous+Cell+Carcinoma+and+Endocervical+Adenocarcinoma:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
154	1	Prognostic markers in testis cancer	24	12.8	1	prognostic:Testicular+Germ+Cell+Tumor:Favorable+potential+prognostic:Favorable+validated+prognostic:Unfavorable+potential+prognostic:Unfavorable+validated+prognostic
155	3	Cancer-related kinases not secreted to blood	123	11.4	1	protein_class:Enzymes+Kinases+AND+protein_class:Cancer+related+genes+NOT+sa_location:Secreted+to+blood
156	3	Cancer-related transcription factors enriched in brain	4	12.3	1	protein_class:Transcription+factors+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Brain:Tissue+enriched
157	4	Cancer-related enzymes enriched in liver secreted to blood	7	12.0	1	protein_class:Enzymes+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Liver:Tissue+enriched+AND+sa_location:Secreted+to+blood
158	3	Cancer-related CD markers enriched in bone marrow	2	12.1	1	protein_class:CD+markers+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Bone+marrow:Tissue+enriched
159	3	Cancer-related membrane proteins enriched in kidney	0	12.1	1	protein_class:Predicted+membrane+proteins+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Kidney:Tissue+enriched
160	3	Cancer-related plasma proteins secreted to blood	164	12.0	1	protein_class:Plasma+proteins+AND+protein_class:Cancer+related+genes+AND+sa_location:Secreted+to+blood
161	4	Cancer-related transporters enriched in brain not in liver	3	13.9	1	protein_class:Transporters+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Brain:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
162	3	Cancer-related nuclear receptors enriched in prostate	0	11.2	1	protein_class:Nuclear+receptors+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Prostate:Tissue+enriched
163	3	Cancer-related ribosomal proteins enriched in testis	0	11.2	1	protein_class:Ribosomal+proteins+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Testis:Tissue+enriched
164	4	Cancer-related proteases enriched in stomach not in liver	1	14.8	1	protein_class:Enzymes+Peptidases+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Stomach:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
165	3	Cancer-related FDA drug targets enriched in brain	4	11.6	1	protein_class:FDA+approved+drug+targets+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Brain:Tissue+enriched
166	4	Cancer-related metabolic proteins enriched in liver not in kidney	7	12.1	1	protein_class:Metabolic+proteins+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Liver:Tissue+enriched+AND+tissue_category_rna:Kidney:Not+detected
167	3	Cancer-related voltage-gated ion channels enriched in brain	0	12.6	1	protein_class:Voltage-gated+ion+channels+AND+protein_class:Cancer+related+genes+AND+tissue_category_rna:Brain:Tissue+enriched
168	3	Disease related kinases enriched in liver	0	11.7	1	protein_class:Enzymes+Kinases+AND+protein_class:Disease+related+genes+AND+tissue_category_rna:Liver:Tissue+enriched
169	3	Disease related enzymes not secreted to blood	1325	12.8	1	protein_class:Enzymes+AND+protein_class:Disease+related+genes+NOT+sa_location:Secreted+to+blood
170	4	Disease related transporters enriched in kidney not in liver	8	12.9	1	protein_class:Transporters+AND+protein_class:Disease+related+genes+AND+tissue_category_rna:Kidney:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected
171	3	Disease related membrane proteins enriched in brain	60	12.8	1	protein_class:Predicted+membrane+proteins+AND+protein_class:Disease+related+genes+AND+tissue_category_rna:Brain:Tissue+enriched
172	3	Disease related predicted secreted proteins enriched in placenta	8	11.6	1	protein_class:Disease+related+genes+AND+protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Placenta:Tissue+enriched
173	4	Disease related transcription factors enriched in testis not in ovary	2	13.9	1	protein_class:Transcription+factors+AND+protein_class:Disease+related+genes+AND+tissue_category_rna:Testis:Tissue+enriched+NOT+tissue_category_rna:Ovary:Tissue+enriched+Group+enriched
174	4	FDA approved kinases enriched in brain not in liver	2	14.8	1	protein_class:Enzymes+Kinases+AND+protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Brain:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
175	3	FDA approved enzymes enriched in liver	24	11.8	1	protein_class:Enzymes+AND+protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Liver:Tissue+enriched
176	4	FDA approved transporters enriched in kidney not in liver	9	13.8	1	protein_class:Transporters+AND+protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Kidney:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
177	4	FDA approved membrane proteins enriched in brain not secreted to blood	40	14.9	1	protein_class:Predicted+membrane+proteins+AND+protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Brain:Tissue+enriched+NOT+sa_location:Secreted+to+blood
178	3	FDA approved nuclear receptors enriched in prostate	0	10.7	1	protein_class:Nuclear+receptors+AND+protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Prostate:Tissue+enriched
179	3	Nuclear proteins enriched in testis not in liver	188	27.8	2	subcell_location:Nucleoplasm+AND+tissue_category_rna:Testis:Tissue+enriched+NOT+tissue_category_rna:Liver:Tissue+enriched
180	3	Cytosol proteins enriched in liver not secreted to blood	21	12.8	1	subcell_location:Cytosol(Main+location)+AND+tissue_category_rna:Liver:Tissue+enriched+NOT+sa_location:Secreted+to+blood

#	AXES	QUERY	GENES	TIME (S)	ATT.	URL
181	3	Endoplasmic reticulum proteins enriched in pancreas not in liver	6	12.3	1	subcell_locationEndoplasmic+reticulum+AND+tissue_category_rnaPancreas;Tissue+enriched+NOT+tissue_category_rnaLiver;Tissue+enriched
182	3	Golgi apparatus proteins enriched in kidney not secreted to blood	1	15.1	1	subcell_locationGolgi+apparatus+AND+tissue_category_rnaKidney;Tissue+enriched+NOT+sa_locationSecreted+to+blood
183	3	Centrosome proteins enriched in testis not in brain	14	12.1	1	subcell_locationCentrosome+AND+tissue_category_rnaTestis;Tissue+enriched+AND+tissue_category_rnaBrain;Not+detected
184	3	Vesicle proteins enriched in brain not in liver	43	22.9	2	subcell_locationVesicles+AND+tissue_category_rnaBrain;Tissue+enriched+AND+tissue_category_rnaLiver;Not+detected
185	3	Actin filament proteins enriched in heart muscle not in skeletal muscle	1	14.4	1	subcell_locationActin+filaments+AND+tissue_category_rnaHeart+muscle;Tissue+enriched+NOT+tissue_category_rnaSkeletal+muscle;Tissue+enriched+Group+enriched
186	3	Intermediate filament proteins enriched in skin not in liver	3	11.9	1	subcell_locationIntermediate+filaments+AND+tissue_category_rnaSkin;Tissue+enriched+AND+tissue_category_rnaLiver;Not+detected
187	3	Focal adhesion proteins enriched in placenta not in brain	0	14.1	1	subcell_locationFocal+adhesion+sites+AND+tissue_category_rnaPlacenta;Tissue+enriched+NOT+tissue_category_rnaBrain;Tissue+enriched
188	3	Peroxisome proteins enriched in liver not in kidney	0	13.4	1	subcell_locationPeroxisomes+AND+tissue_category_rnaLiver;Tissue+enriched+AND+tissue_category_rnaKidney;Not+detected
189	3	Lysosome proteins enriched in spleen not in brain	0	12.0	1	subcell_locationLysosomes+AND+tissue_category_rnaLymphoid+tissue;Tissue+enriched+AND+tissue_category_rnaBrain;Not+detected
190	3	Cell junction proteins enriched in colon not in liver	1	13.2	1	subcell_locationCell+Junctions+AND+tissue_category_rnaIntestine;Tissue+enriched+AND+tissue_category_rnaLiver;Not+detected
191	3	Nucleolus proteins enriched in testis not in brain	38	13.4	1	subcell_locationNucleoli+AND+tissue_category_rnaTestis;Tissue+enriched+AND+tissue_category_rnaBrain;Not+detected
192	3	Lipid droplet proteins enriched in liver not in brain	0	12.3	1	subcell_locationLipid+droplets+AND+tissue_category_rnaLiver;Tissue+enriched+AND+tissue_category_rnaBrain;Not+detected
193	2	Centriolar satellite proteins enriched in testis	4	11.0	1	subcell_locationCentriolar+satellite+AND+tissue_category_rnaTestis;Tissue+enriched
194	3	Nuclear speckle proteins enriched in brain not in liver	4	12.7	1	subcell_locationNuclear+speckles+AND+tissue_category_rnaBrain;Tissue+enriched+AND+tissue_category_rnaLiver;Not+detected
195	3	Cytoplasmic body proteins enriched in liver not in brain	0	11.7	1	subcell_locationCytoplasmic+bodies+AND+tissue_category_rnaLiver;Tissue+enriched+AND+tissue_category_rnaBrain;Not+detected
196	4	Nuclear membrane proteins enriched in testis not in ovary	0	13.4	1	protein_classPredicted+membrane+proteins+AND+subcell_locationNuclear+membrane+AND+tissue_category_rnaTestis;Tissue+enriched+NOT+tissue_category_rnaOvary;Tissue+enriched
197	2	Kinetochore proteins enriched in bone marrow	0	12.1	1	subcell_locationKinetochore+AND+tissue_category_rnaBone+marrow;Tissue+enriched
198	2	Rods and rings proteins enriched in liver	1	11.0	1	subcell_locationRods+%26+Rings+AND+tissue_category_rnaLiver;Tissue+enriched
199	3	What kinases are found in the retina but not in any other brain region	7	13.0	1	protein_classEnzymes;Kinases+AND+tissue_category_rnaRetina;Tissue+enriched+NOT+brain_category_rnaCerebral+cortex;Cerebellum;Hippocampal+formation;Amygdala;Basal+ganglia;Choroid+plexus;Hypothalamus;Medulla+oblongata;Midbrain;Pons;Spinal+cord;Thalamus;White+matter;Region+enriched
200	3	Show me enzymes that are specific to the adrenal gland and not found in kidney	4	12.0	1	protein_classEnzymes+AND+tissue_category_rnaAdrenal+gland;Tissue+enriched+AND+tissue_category_rnaKidney;Not+detected
201	2	Which transporters are enriched in both the colon and small intestine	25	15.7	1	protein_classTransporters+AND+tissue_category_rnaIntestine;Tissue+enriched
202	3	Find all nuclear receptors that are expressed in the brain but not secreted to blood	37	12.8	1	protein_classNuclear+receptors+AND+tissue_category_rnaBrain;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+NOT+sa_locationSecreted+to+blood
203	2	What proteins are specific to placenta and also secreted to blood	10	11.3	1	tissue_category_rnaPlacenta;Tissue+enriched+AND+sa_locationSecreted+to+blood
204	2	Give me transcription factors found in testis but nowhere else	33	13.6	1	protein_classTranscription+factors+AND+tissue_category_rnaTestis;Tissue+enriched
205	3	Which cancer-related genes are enriched in liver and secreted to blood	35	23.8	2	protein_classCancer+related+genes+AND+tissue_category_rnaLiver;Tissue+enriched+AND+sa_locationSecreted+to+blood
206	3	Show me all mitochondrial kinases enriched in heart	0	12.7	1	protein_classEnzymes;Kinases+AND+subcell_locationMitochondria+AND+tissue_category_rnaHeart+muscle;Tissue+enriched
207	4	Find CD markers enriched in T-cells but not in B-cells or NK-cells	25	16.1	1	protein_classCD+markers+AND+immune_cell_lineage_category_rnaT+cells;Lineage+enriched+NOT+immune_cell_lineage_category_rnaB+cells;Lineage+enriched+NOT+immune_cell_lineage_category_rnaNK+cells;Lineage+enriched
208	4	What enzymes are enriched in stomach but completely absent from liver and pancreas	1	14.0	1	protein_classEnzymes+AND+tissue_category_rnaStomach;Tissue+enriched+AND+tissue_category_rnaLiver;Not+detected+AND+tissue_category_rnaPancreas;Not+detected
209	4	Show me predicted membrane proteins found in brain but not heart or kidney	558	15.6	1	protein_classPredicted+membrane+proteins+AND+tissue_category_rnaBrain;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+tissue_category_rnaHeart+muscle;Not+detected+AND+tissue_category_rnaKidney;Not+detected
210	4	Which FDA drug targets are in the kidney but not in the liver or brain	6	14.0	1	protein_classFDA+approved+drug+targets+AND+tissue_category_rnaKidney;Tissue+enriched+NOT+tissue_category_rnaLiver;Detected+in+all;Detected+in+many;Detected+in+some+NOT+tissue_category_rnaBrain;Detected+in+all;Detected+in+many;Detected+in+some
211	3	Find all transporters that are brain-specific and not secreted	87	22.8	2	protein_classTransporters+AND+tissue_category_rnaBrain;Tissue+enriched+NOT+predicted_locationPredicted+secreted+proteins
212	3	What ribosomal proteins are found in bone marrow but not in the brain	1	12.1	1	protein_classRibosomal+proteins+AND+tissue_category_rnaBone+marrow;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+tissue_category_rnaBrain;Not+detected
213	3	Which proteases are enriched in pancreas and secreted to the digestive system	14	11.4	1	protein_classEnzymes;Peptidases+AND+tissue_category_rnaPancreas;Tissue+enriched+AND+sa_locationSecreted+to+digestive+system
214	4	Find kinases expressed in cerebellum but absent from cerebral cortex and liver	5	14.5	1	protein_classEnzymes;Kinases+AND+brain_category_rnaCerebellum;Detected+in+all;Detected+in+many;Detected+in+some;Detected+in+single+AND+brain_category_rnaCerebral+cortex;Not+detected+AND+tissue_category_rnaLiver;Not+detected
215	3	What are the heart-specific membrane proteins not found in skeletal muscle	5	12.8	1	protein_classPredicted+membrane+proteins+AND+tissue_category_rnaHeart+muscle;Tissue+enriched+AND+tissue_category_rnaSkeletal+muscle;Not+detected
216	3	Which voltage-gated ion channels are brain enriched and not in heart	20	12.1	1	protein_classVoltage+gated+ion+channels+AND+tissue_category_rnaBrain;Tissue+enriched+NOT+tissue_category_rnaHeart+muscle;Tissue+enriched
217	2	Find genes that are enriched in oligodendrocytes but not in astrocytes	31	11.3	1	cell_type_category_rnaOligodendrocytes;Cell+type+enriched+NOT+cell_type_category_rnaAstrocytes;Cell+type+enriched
218	2	What metabolic proteins are found only in the liver	107	10.8	1	protein_classMetabolic+proteins+AND+tissue_category_rnaLiver;Tissue+enriched
219	3	Show me all predicted secreted proteins enriched in breast not going to blood	6	11.3	1	protein_classPredicted+secreted+proteins+AND+tissue_category_rnaBreast;Tissue+enriched+NOT+sa_locationSecreted+to+blood

#	AXES	QUERY	GENES	TIME (s)	ATT.	URL
220	3	Which transcription factors are specific to spermatogenic cells and not in brain	24	12.2	1	protein_class:Transcription+factors+AND+cell_type_group_category_rna:Spermatogenic+cell+types:Cell+type+enriched+AND+tissue_category_rna:Brain+Not+detected
221	3	Find plasma proteins enriched in the kidney that are not secreted to blood	4	11.1	1	protein_class:Plasma+proteins+AND+tissue_category_rna:Kidney:Tissue+enriched+NOT+sa_location:Secreted+to+blood
222	3	What enzymes are in the thyroid but not in the parathyroid	307	13.7	1	protein_class:Enzymes+AND+tissue_category_rna:Thyroid:gland+Detected+in+all+Detected+in+many+Detected+in+some+Detected+in+single+NOT+tissue_category_rna:Parathyroid:gland+Detected+in+all+Detected+in+many+Detected+in+some+Detected+in+single
223	2	Show me all RAS pathway related genes enriched in brain	13	11.9	1	protein_class:RAS+pathway+related+proteins+AND+tissue_category_rna:Brain:Tissue+enriched
224	3	Which immunoglobulin genes are enriched in bone marrow and secreted to blood	0	12.2	1	protein_class:Immunoglobulin+genes+AND+tissue_category_rna:Bone+marrow:Tissue+enriched+AND+sa_location:Secreted+to+blood
225	3	Find cardiomyocyte enriched kinases not found in any other tissue	1	14.2	1	protein_class:Enzymes:Kinases+AND+cell_type_category_rna:Cardiomyocytes:Cell+type+enriched+NOT+tissue_category_rna:Adipose+tissue:Adrenal:gland+Bone+marrow,Brain,Breast,Cervix,Choroid+plexus,Endometrium,Epididymis,Esophagus,Fallopian+tube,Gallbladder,Intestine,Kidney,Liver,Lung,Lymphoid+tissue,Ovary,Pancreas,Parathyroid:gland,Pituitary:gland,Placenta,Prostate,Retina:Tissue+enriched
226	2	What proteins are enriched in pituitary gland and secreted to blood	9	10.5	1	tissue_category_rna:Pituitary:gland:Tissue+enriched+AND+sa_location:Secreted+to+blood
227	6	Kinases enriched in brain not in liver not in heart not in kidney and not secreted to blood	4	14.9	1	protein_class:Enzymes:Kinases+AND+tissue_category_rna:Brain:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Heart+muscle:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+NOT+sa_location:Secreted+to+blood
228	6	Enzymes enriched in liver not in pancreas not in stomach not in kidney and not in brain	24	13.9	1	protein_class:Enzymes+AND+tissue_category_rna:Liver:Tissue+enriched+AND+tissue_category_rna:Pancreas:Not+detected+AND+tissue_category_rna:Stomach:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Brain:Not+detected
229	6	Transcription factors enriched in testis not in ovary not in brain not in liver and not in prostate	24	13.9	1	protein_class:Transcription+factors+AND+tissue_category_rna:Testis:Tissue+enriched+AND+tissue_category_rna:Ovary:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Prostate:Not+detected
230	6	Transporters enriched in kidney not in liver not in brain not in heart and not secreted to blood	16	20.0	1	protein_class:Transporters+AND+tissue_category_rna:Kidney:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Heart+muscle:Not+detected+NOT+sa_location:Secreted+to+blood
231	6	CD markers enriched in bone marrow not in brain not in liver not in testis and not in kidney	7	16.2	1	protein_class:CD+markers+AND+tissue_category_rna:Bone+marrow:Tissue+enriched+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Testis:Not+detected+AND+tissue_category_rna:Kidney:Not+detected
232	6	Predicted secreted proteins enriched in placenta not in liver not in brain not in ovary and secreted to blood	5	17.6	1	protein_class:Predicted+secreted+proteins+AND+tissue_category_rna:Placenta:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Ovary:Not+detected+AND+sa_location:Secreted+to+blood
233	6	Cancer-related kinases enriched in brain not in liver not in kidney and not secreted to blood	0	16.2	1	protein_class:Enzymes:Kinases+AND+protein_class:Cancer-related+genes+AND+tissue_category_rna:Brain:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+NOT+sa_location:Secreted+to+blood
234	5	Hepatocyte enriched enzymes not in brain not in kidney and not secreted to blood	14	16.0	1	protein_class:Enzymes+AND+cell_type_category_rna:Hepatocytes:Cell+type+enriched+AND+tissue_category_rna:Brain:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+NOT+sa_location:Secreted+to+blood
235	5	Neuronal cell enriched kinases not in liver not in kidney and not secreted to blood	5	15.6	1	protein_class:Enzymes:Kinases+AND+cell_type_group_category_rna:Neuronal+cells:Cell+type+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+NOT+sa_location:Secreted+to+blood
236	6	FDA drug targets enriched in brain not in liver not in kidney not in heart and not secreted to blood	31	15.2	1	protein_class:FDA+approved+drug+targets+AND+tissue_category_rna:Brain:Tissue+enriched+AND+tissue_category_rna:Liver:Not+detected+AND+tissue_category_rna:Kidney:Not+detected+AND+tissue_category_rna:Heart+muscle:Not+detected+NOT+sa_location:Secreted+to+blood