MA-LLM

AI-powered screening tool to select papers for meta-analysis: comparison with manual screening or comparison-free selection.

1. Configuration

Entrez Email: your.email@example.com
→ Email used to access NIH database via the BioC API

AI Provider: Select Provider
→ Provider of the LLM (e.g., OpenAI, Anthropic, or Ollama for local models)

Model Name: e.g. llama3-8b-8192, gpt-4
→ Name of the specific LLM (Determines number of parameters and training data)

API Key: Enter your API key
→ Access code that authenticates use of the LLM service

2. Screening Mode

Screening Mode: Specify Screening Mode

1. Screening Selection Comparison: LLM selection is compared to previous screening with a predefined list of prompts
2. Comparison-free Screening: the LLM selects papers without comparison to previous screening

Specify Screening Mode
Screening Selection Comparison
Comparison-free Screening

(used in this paper)

Screening Selection Comparison Files

Initial PMIDs (.txt): Choose file No file chosen

Initial.txt
1 16279822
2 26672700
3 22900592
4 37959247
...

→ PMIDs of all papers Screened by MA & LLM

Selected Subset

Gold Standard PMIDs (.txt): Choose file No file chosen

Goldstandard_Selected.txt
1 16279822
2 26672700
...

→ True positives Selected by reference MA

Prompts (.xlsx): Choose file No file chosen

Prompts.xlsx

	A	B	C	D
1	TitlePrompt	AbstractPrompt	screen_titles	screen_abstra...
2	Screen the scientific paper abstracts below to ...	Screen the scientific paper abstracts below to ...	0	1
3	Analyze the provided abstracts to determine t...	Analyze the provided abstracts to determine t...	0	1
4	Review and assess the following paper abstra...	Review and assess the following paper abstra...	0	1

→ Full list of prompts for LLM

Computes signal detection metrics from selection comparison

TitlePrompt	AbstractPrompt	screen_titles	screen_abstracts	sensitivity	specificity	PPV	NPV	tp	tn	fp	fn
Review the followi	Review the following ac	1	0	0.869565217	0.907407407	0.8	0.942307692	20	49	5	3
Screen the researc	Screen the research me	1	0	0.869565217	0.833333333	0.689655172	0.9375	20	45	9	3
Critically assess t	Critically assess the pr	1	0	0.869565217	0.777777778	0.625	0.933333333	20	42	12	3
You are tasked wit	You are tasked with eva	1	0	0.913043478	0.888888889	0.777777778	0.96	21	48	6	2
Screen the followi	Screen the following pa	1	0	0.826086957	0.814814815	0.655172414	0.916666667	19	44	10	4
Go through the titl	Go through the abstrac	1	0	0.826086957	0.5	0.413043478	0.870967742	19	27	27	4
Screen the titles b	Screen the abstracts be	0	1	0.913043478	0.148148148	0.313432836	0.8	21	8	46	2
Screen the titles b	Screen the abstracts be	0	1	0.956521739	0.12962963	0.31884058	0.875	22	7	47	1
You are a world-cl	You are a world-class c	0	1	0.956521739	0.12962963	0.31884058	0.875	22	7	47	1
Do not exclude an	Do not exclude any abs	0	1	0.956521739	0.12962963	0.31884058	0.875	22	7	47	1
Select the most rel	Select the most relevan	0	1	0.652173913	0.296296296	0.283018868	0.666666667	15	16	38	8
Of the titles below	Of the abstracts below,	0	1	0.782608696	0.333333333	0.333333333	0.782608696	18	18	36	5

Comparison-free Screening Configuration

PubMed Search Query: Enter your PubMed search query (e.g., 'cancer therapy')
→ Exactly parallel to PubMed search with Boolean logic (AND, OR, NOT) and search field specifications (e.g., "[author]")

Max Articles to Screen:
→ Maximum number of articles to retrieve from PubMed

Screening Prompt: Specify the prompt that the LLM will use to screen articles
→ Prompt that the LLM will use to screen articles (e.g., selection criteria, or the topic of your MA)

Screening Level:
→ Determines which section of the papers in screened by the LLM

- (•) Titles Only
- ( ) Abstracts Only
- ( ) Titles then Abstracts (Sequential)

PubMed_Query	Screening_Prompt	Screen_Level	Total_Articles	Relevant_Articles	Relevant_PMIDs
("brain metastases"[MeSH Terms] "cerebral metastases"[Title/Abstract]) AND ("neurosurgical procedures"[MeSH Terms] OR "neurosurgery"[MeSH])	Screen the following article titles for potential eligibility in a meta-analysis evaluating clinical outcomes (e.g., survival, recurrence, complications, quality of life) in patients with brain metastases treated with neurosurgical resection. Indicate whether each title is likely relevant, potentially relevant (needs abstract/full-text review), or not relevant.	titles	40	8	41034823,41034 761,41034404,41 034396,4103410 6,41033989,4103 3956,41033921

3. Start Process

Start Screening
Status: Idle

Start Screening
✓ All fields validated successfully
Status: Screening titles (5/74) von Prompt (1/4)
Stop Process | Export Intermediate Results

Start Screening
✓ All fields validated successfully
Status: Completed! Results saved to prompt_results.xlsx
Download Results