

Slide 1 – Introduction: This presentation introduces **key AI tools** that can boost research in biology and medicine. We'll cover AI-powered platforms for **literature search, analysis, and academic writing**, along with other handy tools. The goal is to provide a concise overview of each tool's purpose and strengths, with visuals (logos/screenshots) and brief descriptions. The slides are formatted as a handout – useful for following along during a live talk.

Slide 2: Literature Search Tools

(AI tools to find and explore research papers)

- **Elicit** – An AI research assistant that semantically searches over 100+ million papers (including Semantic Scholar and PubMed) to answer your questions bmcmmedresmethodol.biomedcentral.com. It finds relevant biomedical studies even without exact keyword matches and generates brief summaries of findings, speeding up literature reviews bmcmmedresmethodol.biomedcentral.com.
<ins>Strength:</ins> Quickly surfaces evidence and “seed” articles for a topic, useful for scoping out what’s known in biomedicine.
- **Semantic Scholar** – A free, AI-powered academic search engine by Allen AI covering 200+ million publications (all fields, with strong biomedical coverage) en.wikipedia.org. It offers AI-generated paper summaries (TL;DRs) and highlights key points en.wikipedia.org, helping researchers identify relevant biology/medicine papers faster. <ins>Strength:</ins> Its “Semantic Reader” provides in-line contextual insights (e.g. citation summaries) en.wikipedia.org, making it easier to digest dense scientific literature.
- **Consensus** – An AI-driven literature search engine that **directly answers questions** by synthesizing findings from a vast corpus of papers (200M+ scholarly documents) blogs.stthomas.edu. It provides instant, cited summaries for queries and even a “Consensus Meter” to show how studies align on yes/no questions blogs.stthomas.edu (e.g. do most studies support a treatment’s effectiveness?). <ins>Strength:</ins> Great for evidence-based answers in health sciences – you get quick insights backed by citations, minimizing the risk of AI hallucination by rooting answers in real research blogs.stthomas.edu.
- **Connected Papers** – A unique **visual tool** that generates a graph of research papers related to a given paper or topic lesswrong.com. It maps papers by similarity (co-citation and bibliographic coupling) rather than direct citations, revealing connections between works that might not reference each other lesswrong.com.
<ins>Strength:</ins> Helps biomedical researchers exploring a new field to **see the “big picture”** – e.g. identify key clusters of research, seminal papers, or emerging trends at a glance, which might be missed with linear search.
- **Undermind** – An AI-first literature search engine optimized for **complex queries**. It uses adaptive, LLM-powered exploration of titles/abstracts and citation chaining to surface highly relevant papers, ranked by “topic match” and visualized via timeline maps and citation networks. *Strength:* Good at uncovering relevant papers that use different terminology from your query. katinamagazine.org+2bond.libguides.com+2
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Slide 3: Research Analysis Tools

(AI tools for analyzing and reviewing research information)

- **Scite** – An AI-powered citation analysis platform that goes beyond counting citations by showing **citation context**clemons.libguides.com. Its **Smart Citations** feature labels references as supporting or contradicting evidence for the cited claimclemons.libguides.com, helping you quickly gauge a paper's credibility. *Strength:* In biomedical research, Scite can quickly show if a study's results are supported or challenged by later studies – a big help in evidence synthesis and critical appraisal.
- **Rayyan** – An intelligent systematic review platform designed to **speed up literature screening**help.rayyan.ai. It allows multiple reviewers to collaboratively screen and label study abstracts and uses ML to learn from your decisionshelp.rayyan.ai. Rayyan can suggest which references are likely relevant (5-star relevance rankings) as you include/exclude studieshelp.rayyan.ai. *Strength:* Widely used in healthcare systematic reviews, it saves time by prioritizing pertinent studies and supports features like blinding, duplicate detection, and team chat – all ensuring a **rigorous yet efficient** screening process.
- **ASReview** – An open-source AI tool for **active learning in systematic reviews**global-psychotrauma.net. You provide a set of included/excluded example papers, and ASReview's ML model then ranks the remaining thousands of studies by relevanceglobal-psychotrauma.net. It continually updates the ranking as you screen (honing in on the likely relevant ones first). *Strength:* Dramatically cuts down screening workload – studies show it can reduce screening time by ~80% while still finding ~95% of relevant paperspmc.ncbi.nlm.nih.gov. Ideal for biomedical reviews where exhaustive searches yield overwhelming volumes of literature.
- **SciSpace (Research Assistant)** – An AI research platform (formerly Typeset) that features **Copilot**, an AI assistant to help read and analyze papersscispace.com. You can upload a PDF or select from 200M papers in their library, and the AI will *explain technical sections, define jargon, and answer questions about the text* in real-timescispace.com. *Strength:* Acts like a “virtual mentor” while reading biomedical papers – for example, it can clarify a complex method or statistic in a bioinformatics paper on the spot, helping researchers and students **understand content faster** without having to search elsewhere.
- **NotebookLM** – A Google tool that ingests your own documents (PDFs, slides, web pages) and lets you ask questions, generate summaries, or get audio overviews (podcast-like summaries) based on them. *Strength:* Helps you internalize and navigate your personal reading materials (e.g. your lab's PDFs, articles) in a conversational mode. sites.google.com+3blog.google+3notebooklm.google+3

Slide 4: Academic Writing Tools

(AI tools to help write and polish research papers)

- **SciSpace AI Writer** – An AI-powered academic writing assistant integrated into SciSpacesscispace.com. It can autocomplete sentences, suggest rephrasing, and even recommend relevant citations from 280M+ papers as you writescispace.com. *Strength:* Helps biomedical authors draft papers faster and with proper academic tone – e.g. it might suggest a citation for a statement about CRISPR gene editing from latest literature. It ensures your writing is **grounded in scholarly sources**, which is crucial for academic integrity.
- **Grammarly** – A well-known AI writing assistant focusing on **grammar and style**. It corrects grammatical errors, awkward phrasing, and clarity issues in real time. For academic writing, Grammarly (with Premium) also offers tone adjustments and formality level checks. *Strength:* Ensures your biology/medicine manuscript reads professionally – catching typos, improving sentence structure, and even detecting plagiarism. It's not domain-specific, but it excels at producing polished, **clear English** so your scientific ideas aren't lost in poor writing.
- **Paperpal** – An AI academic writing tool by Editage, built specifically for research manuscripts. It provides in-depth language editing with context-aware suggestions tailored to academic stylepaperpal.com. Studies have noted it offers 3x more suggestions for improvement compared to generic tools, particularly on scientific usage and formal tonepaperpal.com. *Strength:* Besides grammar, it checks discipline-specific conventions (like units, abbreviations), helps with paraphrasing complex sentences, and even includes a **journal submission readiness check** (formatting, compliance). This is very useful for biomedical authors to get a submission-ready paper that meets journal standards.

Slide 5: Other Useful AI Tools

(General-purpose AI assistants for researchers)

- **ChatGPT** – A versatile LLM-based chatbot by OpenAI that can assist with a range of tasks: brainstorming research ideas, explaining concepts in simple terms, summarizing articles, or even generating analysis code. *Strength:* In a biomedical research context, ChatGPT can rapidly **outline a research proposal**, suggest potential study methods, or simplify a dense medical article into layman's terms. **Caution:** It doesn't cite sources and may occasionally produce incorrect or made-up information, so its outputs should be verified. When used carefully (e.g. to rephrase text or get coding help in R/Python), it can boost productivity and creativity.
- **Perplexity** – An **AI answer engine** that combines large language models with live web search to answer queries with cited sourcesperplexity.ai. Think of it as ChatGPT with a built-in research librarian: ask it a question and it returns a concise answer **with footnoted references to webpages or papers**. *Strength:* Great for quick fact-checks or obtaining a summary of a biomedical topic **with evidence**. For example, ask about the latest COVID-19 vaccine efficacy and Perplexity will give a sourced answer pointing to recent studies or news, which you can then follow for more detail.
- **ResearchRabbit** – An AI-driven literature **discovery and visualization** tool. It allows you to create collections of papers and then suggests related work by analyzing

citation networks and co-authorship libguides.trinity.edu. You can explore interactive graphs of how papers and authors connect, similar to Connected Papers. It also has an alert feature to track new papers by specific authors or on topics.

Strength: Excellent for **staying up-to-date** in a niche biomedical field – e.g., follow a gene therapy topic and get recommendations for new papers, or find new collaborators by seeing who co-authors with whom. It turns the literature search into a dynamic, iterative process where the tool “learns” your interests.

- **Scholarcy** – An AI tool that **summarizes academic texts into flashcard-style highlights** scholarcy.com. Upload a paper (or use the Chrome extension) and Scholarcy will extract the key points: study aims, methods, main findings, and even important figures/tables, presented as an outline or set of “Summary Flashcards” scholarcy.com. *Strength:* Huge time-saver when you have stacks of biomedical papers – you can quickly grasp the essence of each. It’s like having an automated literature assistant that provides you with a digest of any article, helping you decide which papers to read fully. Particularly useful for students doing literature reviews or researchers screening articles for relevance.