

ASSISTANCE OU RISQUE POUR LA SCIENCE ?

**L'IA GÉNÉRATIVE AU CŒUR
DES OUTILS DE RECHERCHE DE LITTÉRATURE ACADÉMIQUE**

PRÉSENTATION

Dans le sillage de ChatGPT, l'IA générative intègre progressivement les outils de recherche bibliographique. Si ces fonctionnalités IA promettent un accès plus aisé à la revue de littérature et une productivité accrue, il convient de s'interroger dès maintenant sur leurs usages et leurs apports. Peuvent-ils faire progresser la science ? Et sommes-nous prêts pour l'ère de la recherche sémantique générative ?

Intervention dans le cadre de l'ARF Doccitanist *De la Gestion de l'Information à la Publication : l'impact de l'IA* (Délégation Régionale Occitanie Est CNRS, Montpellier, 18/11/2024)

D É R O U L É

- La recherche bibliographique à l'heure sémantique et conversationnelle **#IA générative**
- Une fonctionnalité de plus en plus standard **#assistance**
- État des lieux actuel **#risques**

DÉROULÉ

- **La recherche bibliographique à l'heure sémantique et conversationnelle**
#IA générative
- Une fonctionnalité de plus en plus standard
- État des lieux actuel

AI science search engines expand their reach

[Nicola Jones](#)[Nature](#) (2016) | [Cite this article](#)

1716 Accesses

How AI technology can tame the scientific literature

As artificially intelligent tools for literature and data exploration evolve, developers seek to automate how hypotheses are generated and validated.

[Andy Extnance](#)

Artificial-intelligence tools aim to tame the coronavirus literature

Developers hope that tools for processing natural language will help biomedical researchers and clinicians to find the COVID-19 papers that they need.

[Matthew Hutson](#)

Drowning in the literature? These smart software tools can help

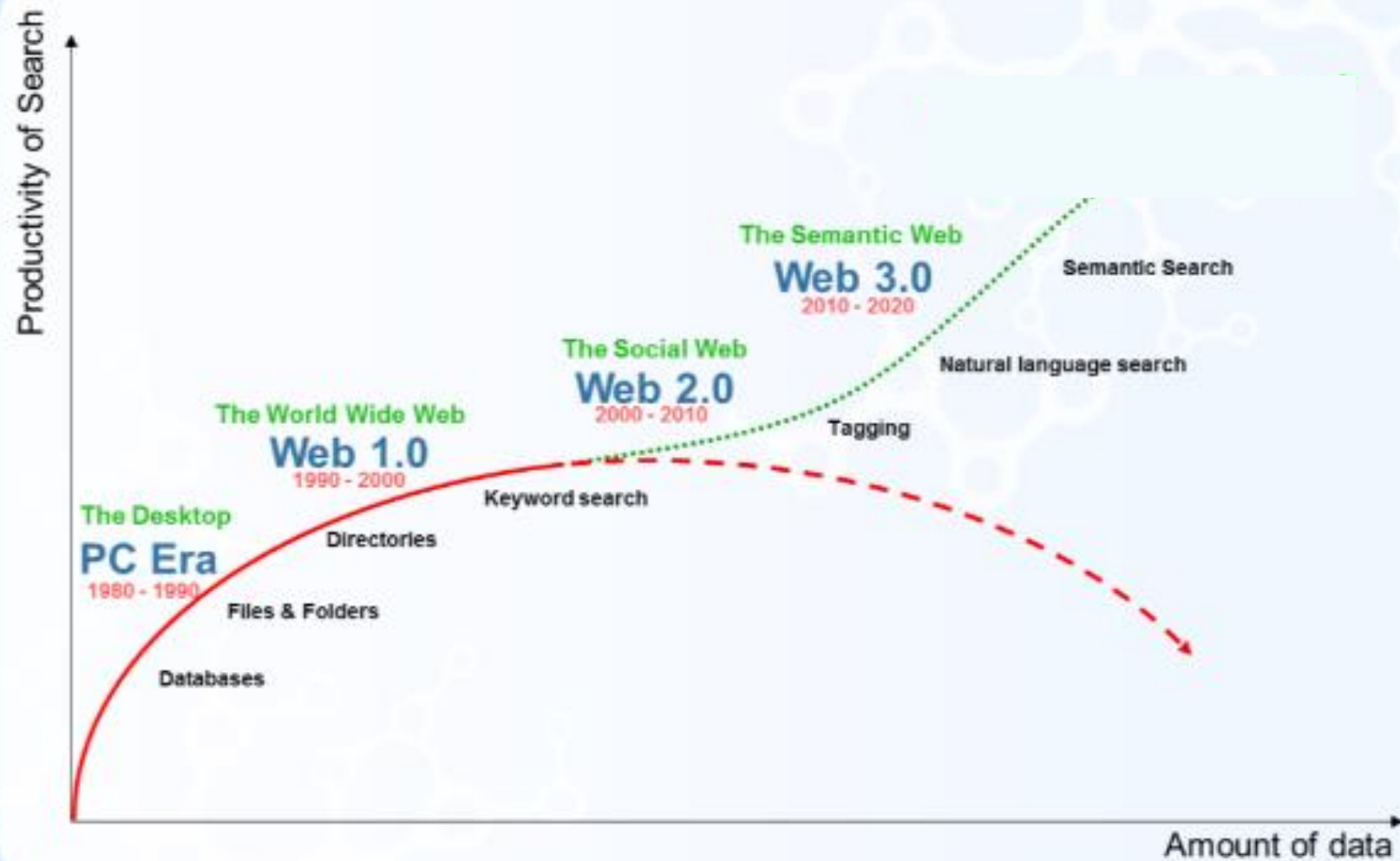
Search engines that highlight key papers are keeping scientists up to date.

[David Matthews](#)

Every time Eddie Smolyansky had a few moments to himself, he tried to stay abreast of new publications in his field. But by 2016, the computer-vision researcher, who is based in Tel Aviv, Israel, was receiving hundreds of automated literature recommendations per day. "At some point the bathroom breaks weren't enough," he says. The recommendations were "way too much, and impossible to keep up with".

's transmission:
rs related to the SARS-
cles – far too many for
intelligence (AI) tools
re.

Beyond the Limits of Keyword Search



Search 222 193 055 papers from all fields of science

Try: [Stephen D. Evans](#) • [Socialism](#) • [Neumann Series](#)

[Sign In](#)

[Create Free Account](#)

DOI: 10.1371/journal.pone.0094482 • Corpus ID: 12973470

Pesticide Residues and Bees – A Risk Assessment

F. Sánchez-Bayo, K. Goka • Published in PLoS ONE 9 April 2014 • Environmental Science, Agricultural and Food Sciences, Biology

TLDR Risks appear to be low, but analysis indicates that residues of pyrethroid and neonicotinoid insecticides pose the highest risk by contact exposure of bees with contaminated pollen, and the synergism of ergosterol inhibiting fungicides with those two classes of insecticides results in much higher risks in spite of the low prevalence of their combined residues. [Expand](#)

 [\[PDF\] Semantic Reader](#)  [Save to Library](#)  [Create Alert](#)  [Cite](#)

Ask This Paper

AI-Powered

[What is the goal of this paper?](#)

[What are the key results of this paper?](#)

[What methods are used?](#)

Ask a question that can be answered by this paper.

[Submit](#)

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[Figures and Tables](#)

[681 Citations](#)

[104 References](#)

[Related Papers](#)

Figures and Tables from this paper

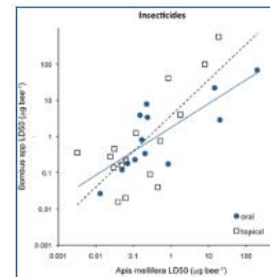


Figure 1

Table 1

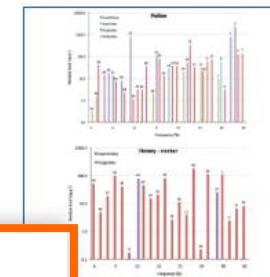


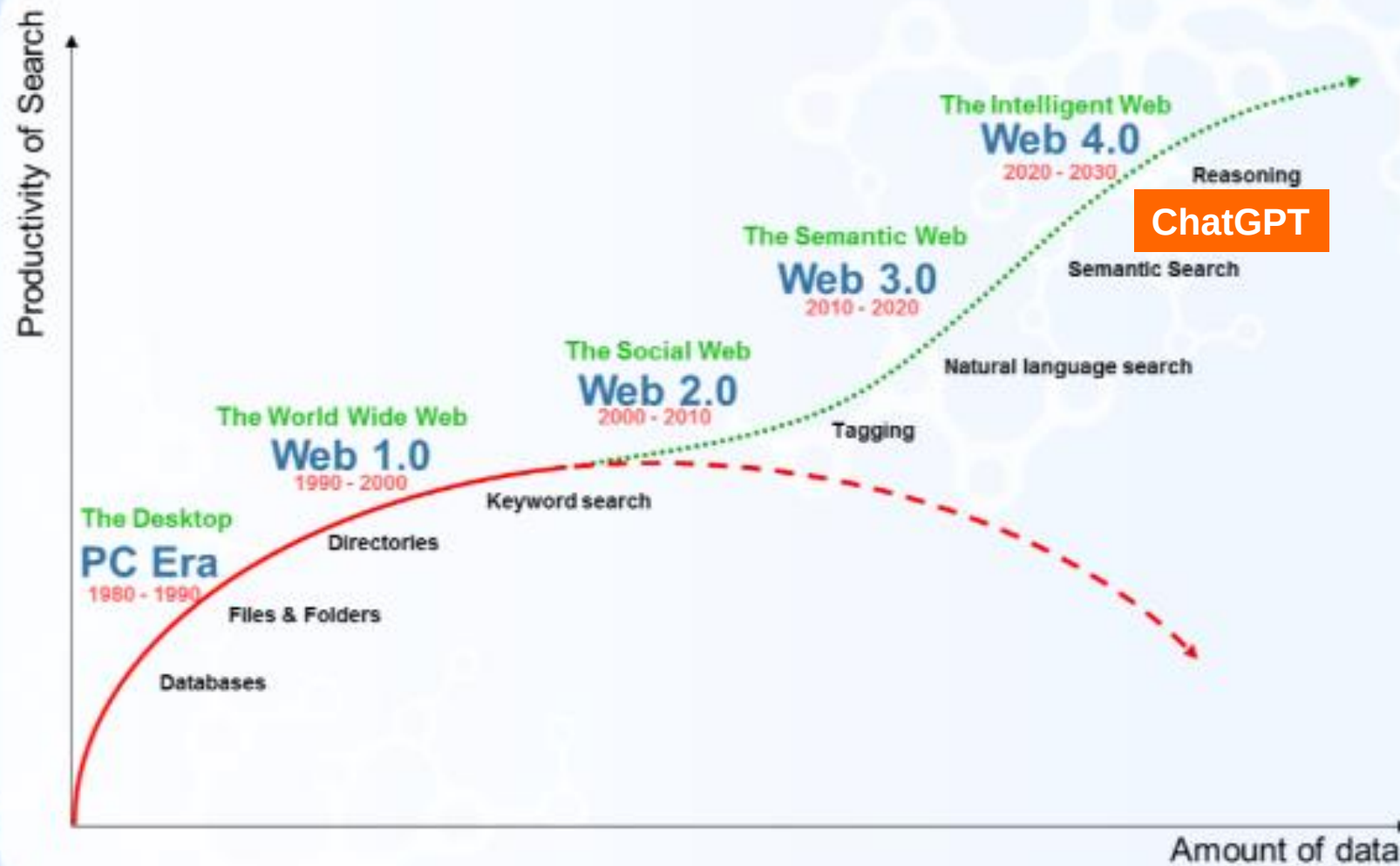
Table 2

Citation Type

- ☒ All Types
- ☐ Background Citations
- ☐ Methods Citations
- ☐ Results Citations

681 Citations

Beyond the Limits of Keyword Search





ChatGPT

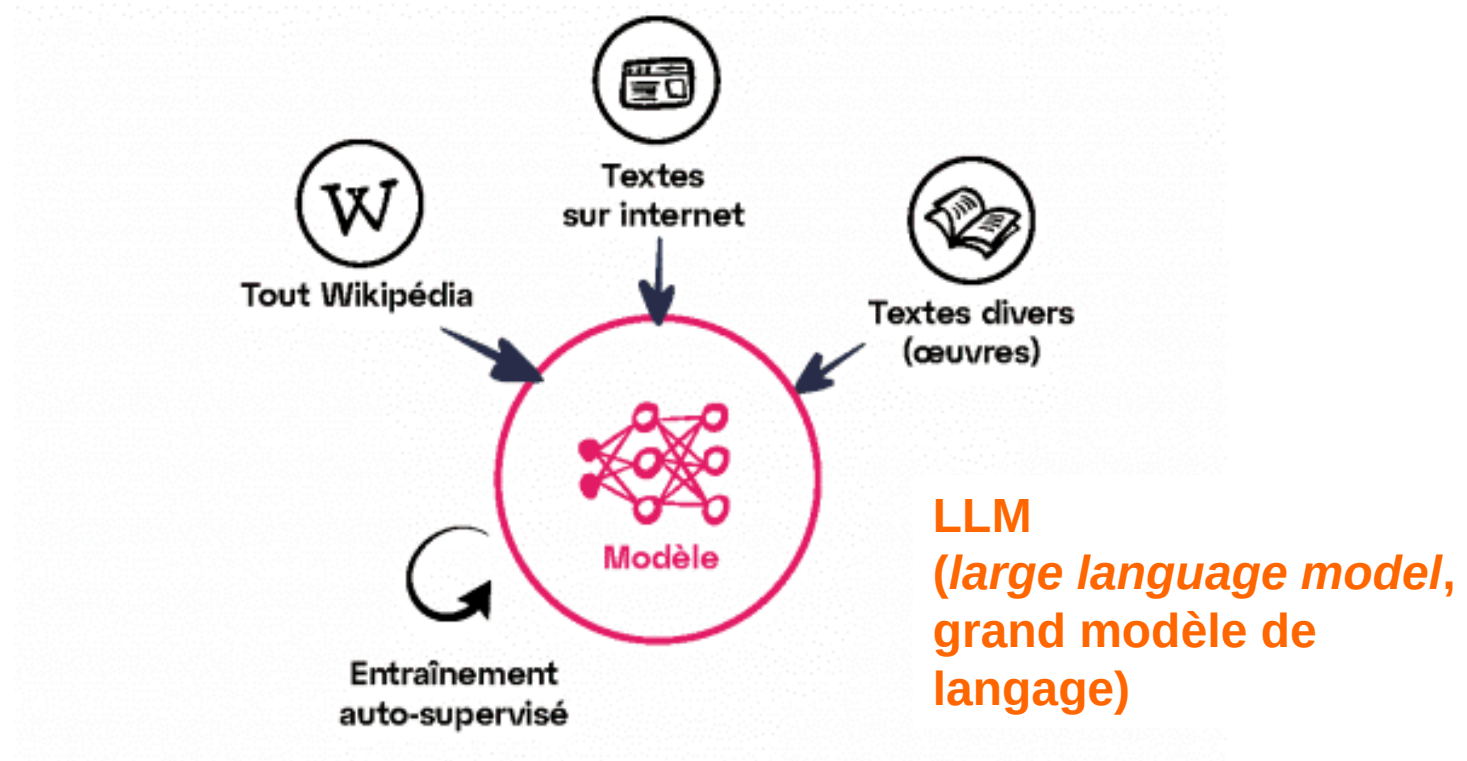
agent conversationnel (*chatbot*)

Generative Pre-trained Transformer
modèle : GPT

données

algorithmes

entraînement

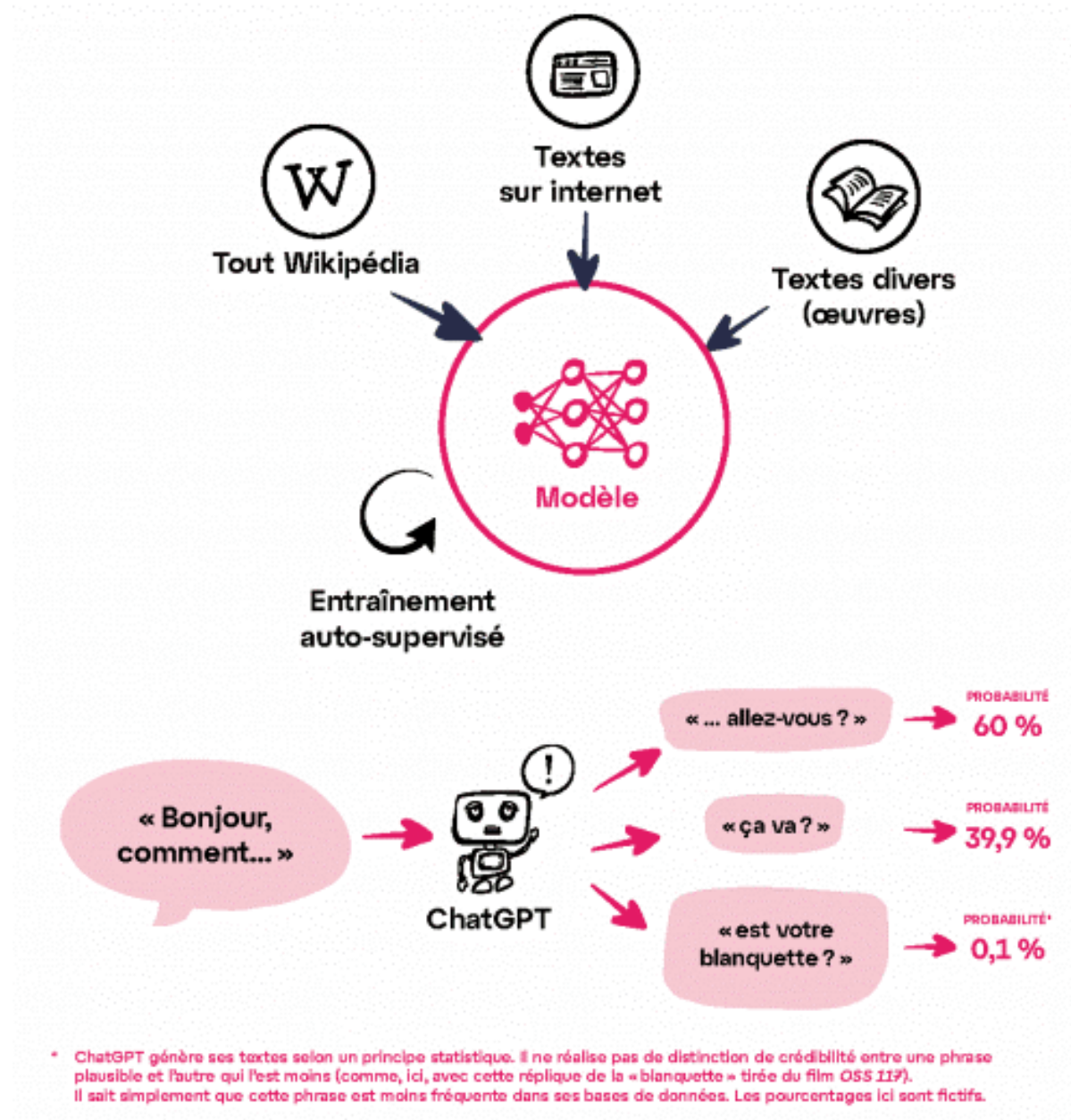


données

algorithmes

entraînement

prompt



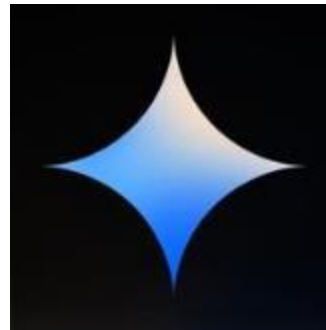
IA génératives textuelles



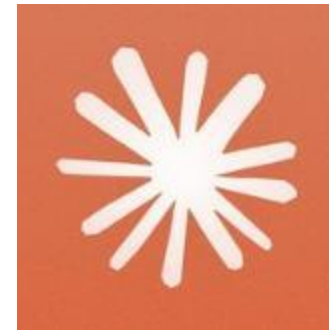
<https://chatgpt.com/>
(OpenAI)



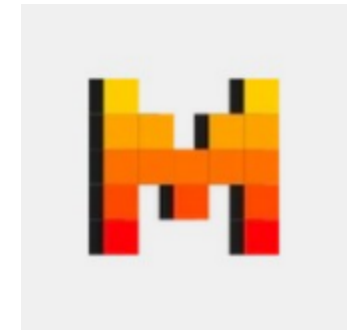
<https://www.bing.com/>
ou
<https://copilot.microsoft.com/>
ou Microsoft 365
(Microsoft, sur GPT)



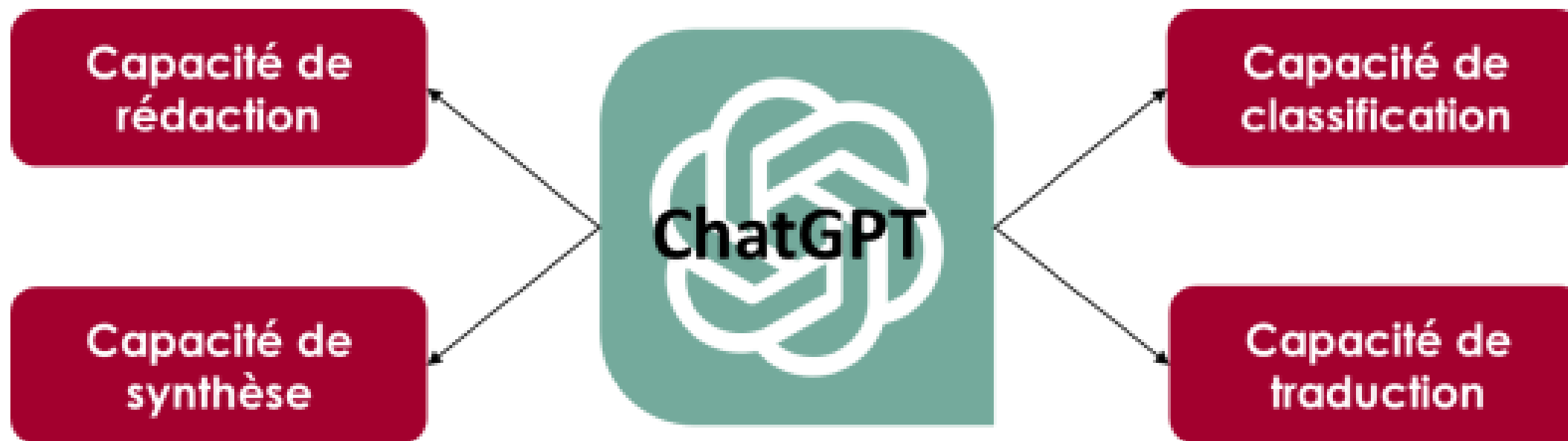
<https://gemini.google.com>
(Google)



<https://claude.ai/>
(Anthropic)

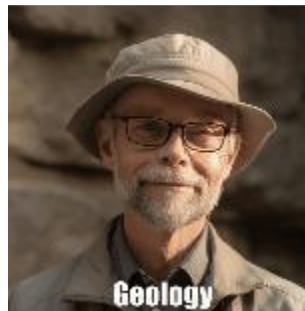
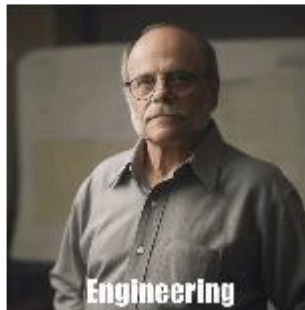
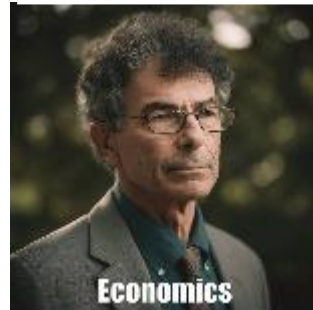
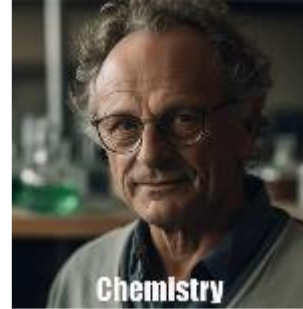
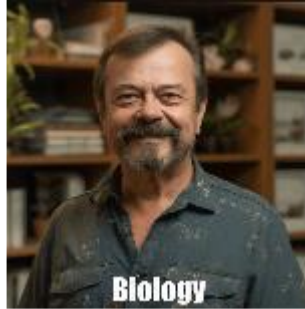


<https://chat.mistral.ai>
(Mistral)



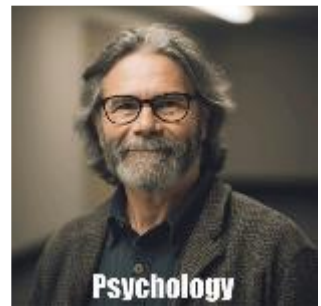
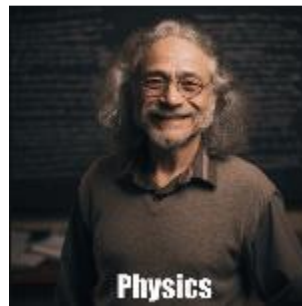
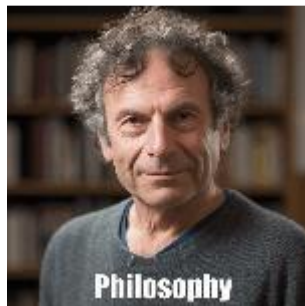
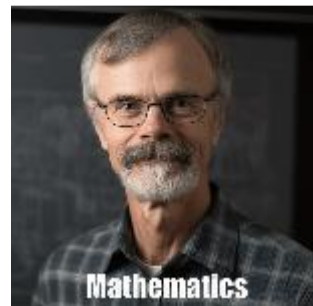
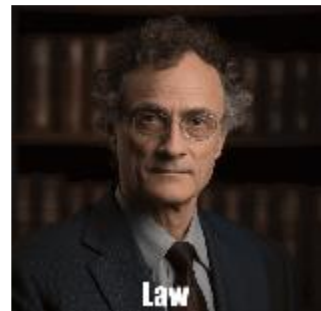
Les usages de ChatGPT

#biais des données d'entraînement



*What Midjourney thinks
professors look like,
based on their department*

[source](#)



#sources ?

les pesticides sont-ils responsables de la disparition des abeilles



Les pesticides, en particulier ceux dits *néonicotinoïdes*, sont souvent pointés du doigt comme étant un facteur majeur contribuant à la disparition des abeilles, bien qu'il n'existe pas une cause unique à ce phénomène complexe. La combinaison de plusieurs facteurs est généralement en cause.

Voici un résumé des principaux éléments :

1. Les néonicotinoïdes et autres pesticides

Les néonicotinoïdes, qui sont des insecticides systémiques (ils agissent sur le système nerveux des insectes), sont particulièrement préoccupants. Ces produits affectent la capacité des abeilles à naviguer, à se nourrir et à communiquer avec les autres membres de la ruche. Lorsqu'une abeille est exposée à ces substances, elle peut perdre sa capacité à retourner à sa ruche, ce qui perturbe gravement la structure de la colonie.

Même à des doses faibles, les néonicotinoïdes peuvent altérer le comportement des abeilles, nuire à leur mémoire spatiale et, à terme, affaiblir la colonie. Des études ont aussi montré qu'ils peuvent rendre les abeilles plus vulnérables à d'autres stress environnementaux, comme les parasites et les maladies.

2. Autres facteurs de stress

La disparition des abeilles n'est pas uniquement liée aux pesticides. D'autres facteurs de stress contribuent également à ce déclin :

- **Maladies et parasites** : Le varroa destructor, un acarien parasite, est une menace majeure pour les colonies d'abeilles. Ce parasite affaiblit les abeilles en les infectant et en se nourrissant de leur hémolymphe, ce qui rend les colonies plus vulnérables à d'autres maladies.
- **Monocultures et manque de diversité florale** : L'intensification de l'agriculture, avec des monocultures étendues, réduit la diversité des plantes et des ressources disponibles pour les abeilles. Cela limite leur alimentation, ce qui peut affecter leur santé.

- **Changements climatiques** : Les variations climatiques modifient les cycles floraux, ce qui perturbe l'approvisionnement en nourriture des abeilles au moment où elles en ont besoin.
- **Habitat naturel réduit** : La destruction des habitats naturels, par l'urbanisation et l'agriculture intensive, laisse peu d'endroits où les abeilles peuvent se reproduire et se nourrir.

3. Réglementation et actions en cours

Face à ce problème, plusieurs pays ont pris des mesures pour limiter l'utilisation des néonicotinoïdes et d'autres pesticides nocifs pour les pollinisateurs. Par exemple, l'Union européenne a interdit certains néonicotinoïdes en 2018. Cependant, les réglementations varient selon les régions, et il reste encore du travail à faire pour protéger efficacement les abeilles.

Conclusion

Les pesticides, en particulier les néonicotinoïdes, jouent un rôle important dans le déclin des abeilles, mais ils ne sont qu'un des facteurs dans une série de pressions environnementales et biologiques. La combinaison de l'exposition aux produits chimiques, des maladies, du changement climatique et de la perte d'habitat contribue au problème. La protection des abeilles nécessite une approche globale qui inclut des solutions pour réduire l'utilisation de pesticides, restaurer les habitats naturels et encourager des pratiques agricoles plus durables.

#hallucinations

'ChatGPT-generated reading list' sparks AI peer review debate

Social scientist sees hand of ChatGPT in list of non-existent papers cited in peer reviewer's rejection

April 5, 2023

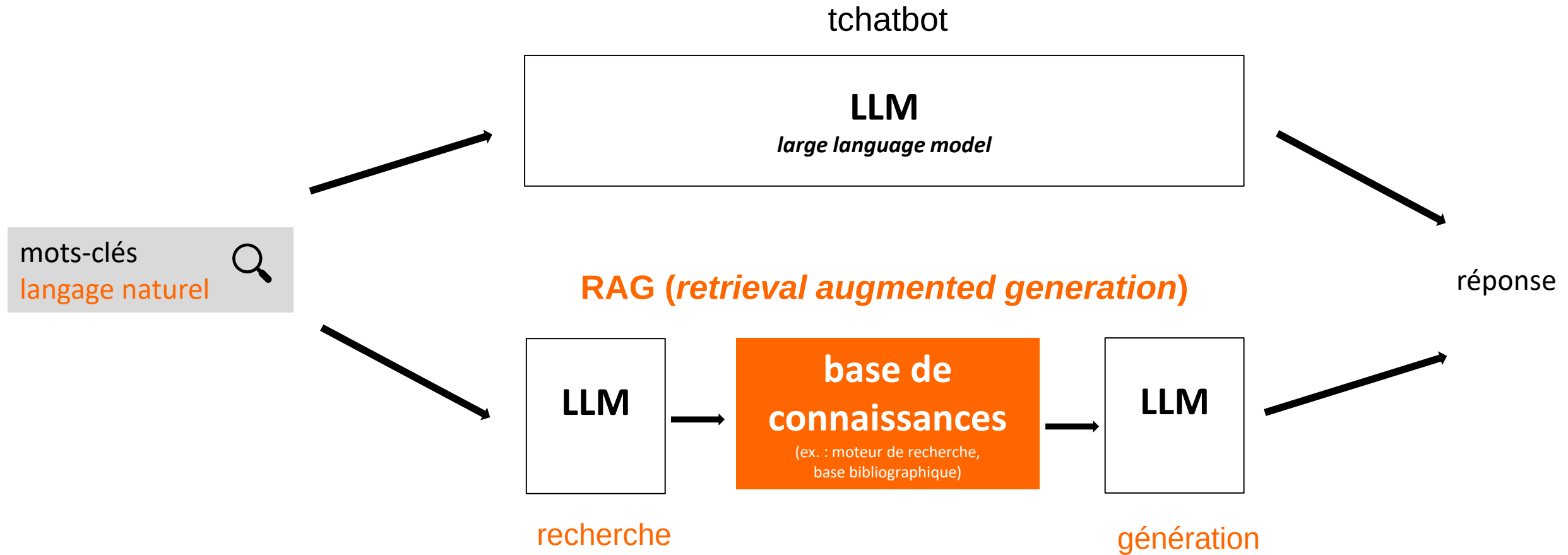
[Jack Grove \(/content/jack-grove-0\)](#)

Twitter: [@jgro_the](https://twitter.com/jgro_the) (https://twitter.com/jgro_the)

Fears over ChatGPT's growing role in peer review have been raised after a Dutch researcher claimed that a reviewer who rejected his paper recommended a handful of fictitious publications invented by the AI chatbot.



[Times higher education, 5/04/2023](#)



What can I help with?

les pesticides sont-ils responsables de la disparition des abeilles



Search the web



les pesticides sont-ils responsables de la disparition des abeilles ?



Oui, les pesticides, en particulier les néonicotinoïdes, jouent un rôle significatif dans le déclin des populations d'abeilles. Ces insecticides agissent sur le système nerveux des abeilles, entraînant des pertes d'orientation et une incapacité à reconnaître les fleurs, ce qui affecte directement leur capacité à polliniser les plantes et contribue à leur disparition. NATIONAL GEOGRAPHIC

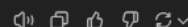
Des études ont montré que les néonicotinoïdes, tels que l'imidaclopride et le clothianidine, peuvent provoquer des lésions cérébrales chez les abeilles, même à des doses sublétales. Ces effets incluent une diminution de l'activité de vol et des performances d'apprentissage olfactif, compromettant ainsi la survie des colonies. WIKIPEDIA

Face à ces risques, l'Union européenne a restreint l'utilisation de certains néonicotinoïdes en 2013, puis a étendu l'interdiction à toutes les utilisations en extérieur en 2018, afin de protéger les populations d'abeilles. WIKIPEDIA

Cependant, les pesticides ne sont pas la seule cause du déclin des abeilles. D'autres facteurs, tels que les parasites (comme le varroa destructor), les maladies, le changement climatique et la perte d'habitats naturels, contribuent également à cette diminution. GREENPEACE FRANCE

En résumé, bien que les pesticides soient une cause majeure du déclin des abeilles, il est essentiel de considérer l'ensemble des facteurs pour élaborer des stratégies efficaces de conservation.

Sources



National Geographic

Disparition des abeilles : hécatombe involontaire - National Geographic

Ces néonicotinoïdes agissent sur le système nerveux des abeilles. Ils ralentissent leur développement, cré...

Wikipedia

Colony collapse disorder

November 6, 2024

Wikipedia

Neonicotinoid

Today

Greenpeace France

Abeilles en danger : les causes et les conséquences

Les principales raisons de la disparition des abeilles. Elles sont multiples et s'entretiennent les unes les...

Search Results

PollenPaths

La disparition des abeilles : causes, impacts et efforts de ...

January 17, 2024 — Les apiculteurs sont non seulement responsables de la production de miel...

Science Post

De quoi les abeilles meurent-elles vraiment - Sciencepost

REQUÊTE

BASE DE DONNÉES BIBLIOGRAPHIQUES

RÉSULTATS

mots-clés, booléens
langage naturel 🔍

LLM

Référence A

Référence B

abstract

Référence C

abstract

texte intégral

LLM

**synthèses et
résumés en langage
naturel**

**extraction
d'informations**

**conversation
(Q & A)**

**prise en charge de
différentes langues**

RAG (*retrieval augmented generation*)

DÉROULÉ

- La recherche bibliographique à l'heure sémantique et conversationnelle

- **Une fonctionnalité de plus en plus standard**

#assistance

- État des lieux actuel

GenAI Tools for Literature Reviews

1.

Research
Question



2.

Literature Search
& Review



3.

Write &
Cite



GenAI Tools for Literature Reviews

1.

Research Question



Common activities

- Brainstorm topics
- Conduct preliminary literature search
- Identify research gaps
- Form hypotheses
- Develop / sharpen research questions

Research tools

Preliminary literature search

Google

Google Scholar

Scholarly databases

e.g. Web of Science, Scopus

Free scholarly databases

e.g. Semantic Scholar, Dimensions, Lens

How AI can help

Brainstorm topics / keywords / hypotheses / research questions

Poe

Copilot

ChatGPT

Preliminary literature search / Identify gaps

Perplexity

Consensus

Mindmapping

GitMind

Whimsical

3. ChatGPT pourrait-il (aider à) réaliser un mémoire ?

Conclusions

- 👍 Résumés, synthèses
- 👍 Liens entre concepts
- 👍 Références, sujet connus
- 👍 Structuration
- 👍 Styles
- 👎 Originalité
- 👎 Fil difficile à construire
- 👎 Arrêts
- 👎 Arrêt après 1h d'utilisation environ
- 👎 Exemples mal adaptés
- 👎 Références douteuses



GenAI Tools for Literature Reviews

2.

Literature Search & Review



Common activities

- Build search query
- Conduct in-depth literature search
- Explore similar articles through citation chaining
- Organize literature
- Read & evaluate studies

Research tools

In-depth literature search

Google Scholar

Scholarly databases
e.g. Web of Science, Scopus

Explore similar articles in visual

Connected Papers

ResearchRabbit

Managing literature

Zotero

EndNote

Mendeley

JabRef (LaTeX)

Reading & annotation

Zotero

EndNote

Acrobat

How AI can help

Build structured search query

Poe

Copilot

ChatGPT

Suggest relevant articles & Extract useful content

Elicit

Scite Assistant

SciSpace

Petal

Undermind

Summarize articles to facilitate reading & evaluation

Poe (Claude / GPT-4o)

principaux outils *freemium*



<https://consensus.app>
(Consensus NLP)



<https://elicit.com/>
(Elicit Research)



<https://typeset.io/>
(PubGenius)



<https://scite.ai/assistant>
(scite)

#interrogation en langage naturel (1)

Ask a yes/no question

 Does creatine improve cognition? 

 Does the death penalty reduce crime? 

 Is CBT effective for anxiety? 

Ask about the relationship between concepts

 What is the impact of climate change on GDP? 

 What are the benefits of mindfulness meditation? 

 What are the long-term health effects of preeclampsia? 

Ask about “what is the best...”

 What is the best treatment for restless leg syndrome? 

Ask “how to” do something

 How do you increase local voter turnout? 

Consensus

Try asking or searching for:

 [How does climate change impact biodiversity?](#)

 [Why are aging Covid patients more susceptible to severe complications?](#)

 [How does social media affect the college selection process?](#)

 [What are the interesting theories about dark matter and dark energy?](#)

 [What is the significance of higher-dimensional algebra?](#)

SciSpace

#interrogation en langage naturel (2)

Are pesticides responsible for the disappearance of bees?

Settings Sources Use Table Mode

Scite

References Search Strategy

→

Searches Used

These are the searches that Assistant ran to find references.

[bees disappearance and pesticides](#)

[impact of pesticides on bees](#)

[pesticides effects on pollinators](#)

[pesticides, pollinators, and food production a global perspective](#)

[the impact of agricultural practices on bee health](#)

[neonicotinoids and pollinator decline a review](#)

#synthèses et résumés

Are pesticides responsible for the disappearance of bees?

Summary of top 4 papers

Copy

Recent studies indicate that pesticides, particularly neonicotinoids and pyrethroids, play a significant role in the decline of bee populations worldwide. These chemicals pose risks through both contact exposure and ingestion of contaminated pollen and honey (Sánchez-Bayo & Goka, 2014). Chronic exposure to field-level concentrations of these pesticides impairs foraging behavior, increases worker mortality, and negatively impacts colony development and survival (Gill et al., 2012). Neonicotinoids, the most widely used insecticides globally, have been shown to affect bees' navigation memory and muscle movements even at sublethal doses (Pereira et al., 2020). The extensive use of pesticides in agriculture has led to the detection of residues in bee bodies and hives, causing both lethal and sublethal effects on bee physiology and behavior (Manzoor & Pervez, 2021). These findings suggest that pesticides, especially when combined, contribute significantly to the ongoing bee crisis and pose a threat to global food security.

Elicit

Are pesticides responsible for the disappearance of bees?

Answer

Pesticides applied to agricultural crops have a negative impact on bees, with pyrethroid and neonicotinoid insecticide residues posing the highest risk by contact exposure.

Pesticide Residues and Bees – A Risk Assessment

F. Sánchez-Bayo, K. Goka · 9 avr. 2014

Save Cite Share

621 Citations 44 Influential Citations

PLoS ONE

Q1 SJR score

Quality indicators

Rigorous Journal Highly Cited

Study snapshot

Population	Urban areas (10-15 years)
Sample size	10
Methods	Observational
Outcomes	Bees' navigation memory and muscle movements
Results	Bees' navigation memory and muscle movements were affected by pesticides

Generate snapshot

PDF Full text Semantic Scholar

Key takeaway

Pesticide residues in pollen and honey pose low overall risks to bees, but pyrethroid and neonicotinoid insecticide residues pose the highest risk by contact exposure and their synergistic toxicity with ergosterol inhibiting fungicides.

Abstract

Bees are essential pollinators of many plants in natural ecosystems and agricultural crops alike. In recent years the decline and disappearance of bee species in the wild and the collapse of honey bee colonies have concerned ecologists and apiculturalists, who search for causes and solutions to this problem. Whilst biological factors such as viral diseases, mite and parasite infections are undoubtedly involved, it is also evident that pesticides applied to agricultural crops have a negative impact on bees. Most risk assessments have focused on direct acute exposure of bees to agrochemicals from spray drift. However, the large number of pesticide residues found in pollen and honey demand a thorough evaluation of all residual compounds so as to identify those of highest risk to bees. Using data from recent residue surveys and toxicity of pesticides to honey and bumble bees, a comprehensive evaluation of risks under current exposure conditions is presented here. Standard risk assessments are complemented with new approaches that take into account time-cumulative effects over time, especially with dietary exposures. Whilst overall risks appear to be low, our analysis indicates that residues of pyrethroid and neonicotinoid insecticides pose the highest risk by contact exposure of bees with contaminated pollen. However, the synergism of ergosterol inhibiting fungicides with those two classes of insecticides results in much higher risks in spite of the low prevalence of their combined residues. Risks by ingestion of contaminated pollen and honey are of some concern for systemic insecticides, particularly imidacloprid and thiamethoxam, chlorpyrifos and the mixtures of cyhalothrin and ergosterol inhibiting fungicides. More attention should be paid to specific residue mixtures that may result in synergistic toxicity to bees.

Ask this paper

Consensus

#extractions d'informations (1)

Answer from top 5 papers ▾

The decline of bee populations, particularly honeybees, has been increasingly linked to pesticide exposure, which poses significant risks to their health and survival. Research indicates that pesticides, especially neonicotinoids and fungicides, have detrimental effects on bee colonies, leading to increased mortality rates and impaired colony functions. The following sections elaborate on the specific impacts of pesticides on bees.

Pesticide Toxicity and Bee Mortality

- Studies have shown that common pesticides like fipronil and lambda-cyhalothrin exhibit high toxicity to honeybee larvae, with mortality rates reaching up to 94% under certain conditions (Waseem & Thakur, 2023).
- In semi-field studies, exposure to neonicotinoids combined with fungicides resulted in a 2.93-fold increase in mortality and reduced colony activity (Shepherd et al., 2024).

Sub-lethal Effects on Behavior and Cognition

- Pesticides can impair essential behaviors such as foraging and communication, affecting the bees' ability to perform their roles within the colony ("Pesticide Impact on Honeybees Declines and Emerging Food Security Crisis", 2022).
- Sub-lethal exposure to pesticides has been linked to altered social behaviors and cognitive functions, which can contribute to colony collapse disorder ("Pesticide Impact on Honeybees Declines and Emerging Food Security Crisis", 2022).

Broader Implications for Ecosystems

- The decline in bee populations due to pesticide exposure poses a threat to global food security, as bees are crucial pollinators for many crops ("Pesticide Impact on Honeybees Declines and Emerging Food Security Crisis", 2022).
- The interaction of pesticides with other stressors, such as pathogens, may exacerbate the decline of bee populations, highlighting the need for comprehensive studies to understand these dynamics (Straub et al., 2022).

While pesticides are a significant factor in bee population declines, other stressors like habitat loss and climate change also play critical roles. Understanding the multifaceted nature of these threats is essential for developing effective conservation strategies.

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Add columns (1) ▾

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Sort by: Relevance ▾ [Export](#) ▾

Papers (10)	TLDR	Create or add columns Create your own custom column or select from the list of suggestions
Journal Article • DOI 🔗 ☐ 1. Effects of common co-occurring pesticides (a neonicotinoid and fungicide) on honey bee colony health in a semi-field study Sebastian Shepherd • 2 more 01 Apr 2024 • Heliyon Request PDF 📄 🔗 💬	-	Create new column + Summarize this article in three key poi + Insights + Conclusions + Summarized Abstract + Results + Summarized Introduction + Methods Used + Literature Survey + Limitations
Open access • Book Chapter • DOI 🔗 ☐ 2. Pesticide Impact on Honeybees Declines and Emerging Food Security Crisis 20 Jul 2022 PDF 📄 2 Summary 📄 🔗 💬	In this paper, a review summarizes the different studies related to pesticide hazards of bees and concludes that pesticides act as poison and ruin vital functions involved in learning and cognition, behavior and, the body physiological mechanisms.	

#extractions d'informations (2)

References Search Strategy

...The overlap between molecular signaling pathways that regulate nurse bee development and the stress response make exposure to...">

Section: Discussion

...The overlap between molecular signaling pathways that regulate nurse bee development and the stress response make exposure to endocrine-disrupting neurotoxins, such as neonicotinoids, particularly hazardous to individual bee and thus colony health [26, 27, 38, 39, 42]. Neonicotinoid exposure may not be the single factor attributed to the decline of honey bee colony health, but rather a component of a number of inter-related stress-inducing factors (e.g., pesticide exposure, disease, and poor nutrition), resulting in precocious foraging, which is a significant factor that may lead to colony collapse [19, 70, 71]...">

Section: Discussion

Compound and Dose-Dependent Effects of Two Neonicotinoid Pesticides on Honey Bee (*Apis mellifera*) Metabolic Physiology

Steven C. Cook¹ 2019 *Insects*

48 | 2 | 27 | 1

[View full text](#) [Add to dashboard](#) [Cite](#)

...Reported widespread declines of wild and managed insect pollinators have serious consequences for global ecosystem services and agricultural production1-3. Bees contribute around 80% of insect pollination, so it is imperative we understand and mitigate the causes of current declines4-6. Recent studies have implicated the role of pesticides as exposure to these chemicals has been associated with changes in bee behaviour7-11 and reductions in colony queen production12...">

Section: Abstract

Combined pesticide exposure severely affects individual- and colony-level traits in bees

Richard J. Gill¹, Oscar Ramos-Rodriguez², Nigel E. Raine³ 2012 *Nature*

816 | 47 | 741 | 4

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...Our study showed that sublethal doses of a neonicotinoid pesticide imidacloprid (50 ppb) that was mixed in bee diet and admin...">

Section: Discussion

Effects of imidacloprid and *Varroa destructor* on survival and health of European honey bees, *Apis mellifera*

Pendo M. Abbo¹, Joshua K. Kawasaki², Michele Hamilton³ et al. 2016 *Insect Science*

51 | 1 | 40 | 1

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Scite

Are pesticides responsible for the disappearance of bees?

Pro Filter

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Beta · 6 papers

Consensus Meter

✓ Yes	67%	
— Possibly	33%	
✗ No	0%	

Pesticides are indeed a significant factor contributing to the decline and disappearance of bee populations. However, they are not the sole cause; multiple interacting stressors are involved.

4 Combined pesticide exposure severely affects individual- and colony-level traits in bees ✓ Yes

Chronic exposure to two pesticides (neonicotinoid and pyrethroid) impairs natural foraging behavior and increases worker mortality, leading to significant reductions in brood development and colony success.

Observational Study Highly Cited

2012 · 820 Citations · Richard J. Gill et al. · Nature

5 Fungicides, herbicides and bees: A systematic review of existing research and methods -- Unknown

There is little known about the effects of herbicides and fungicides on bees, and there is a need for further research to improve the knowledge base on potential impacts.

Systematic Review Rigorous Journal Highly Cited Ask this paper

2019 · 105 Citations · Merissa G. Cullen et al. · PLoS ONE

6 Frequently encountered pesticides can cause multiple disorders in developing worker honey bees. -- Possibly

Pesticide exposure during larvae development may affect the survival and health of immature honey bees, contributing to overall colony stress or loss.

Non-RCT Trial Animal Trial

Consensus

#conversation (1)

Related

What are the long-term effects of pesticide exposure on bee populations?



Do neonicotinoid pesticides significantly contribute to bee population decline?



How do pesticides impact the behavior and cognitive abilities of bees?



Consensus

Are pesticides responsible for the disappearance of bees?

1 free prompt(s) left. [Start your free trial](#) to get unlimited prompts.

The decline of bee populations has become a pressing environmental concern, with pesticides frequently cited as a significant contributing factor. Research indicates that pesticides, particularly neonicotinoids, have detrimental effects on both honey bees (*Apis mellifera*) and wild bee species. These chemicals can disrupt bee behavior, impair cognitive functions, and lead to increased mortality rates, ultimately threatening pollination services essential for global food production and ecosystem health.

Neonicotinoids, a class of neurotoxic insecticides, have been extensively studied for their impact on bee health. For instance, exposure to neonicotinoids has been shown to affect metabolic physiology and reduce the overall fitness of honey bee colonies (Cook, 2019; Gill et al., 2012). Sublethal doses of neonicotinoids like Imidacloprid can lead to significant adverse effects, including decreased body weight and increased mortality among worker bees (Abbo et al., 2016). Furthermore, studies have demonstrated that these pesticides can impair learning and memory in bumblebees, which are crucial for foraging and navigation (Kaakinen, 2024; Siviter et al., 2018). The cognitive impairments caused by pesticide exposure can hinder a bee's ability to efficiently gather food, thereby affecting colony health and survival (Tosi & Nieh, 2017).

In addition to direct toxic effects, pesticides can also interact synergistically with pathogens, exacerbating their harmful impacts on bee populations. Research has shown that the combination of pesticide exposure and infections from pathogens like *Nosema* can severely compromise honey bee immunity and survival (Grassl et al., 2018; Naharki & Regmi, 2020). This synergistic effect highlights the complexity of factors contributing to bee declines, as both pesticides and pathogens can work together to undermine bee health (Syromyatnikov et al., 2021).

Moreover, the landscape context in which bees operate plays a crucial role in moderating the effects of pesticide exposure. Agricultural practices that rely heavily on pesticides can lead to habitat loss and reduced availability of natural food sources for bees, further compounding the negative impacts of pesticide use (Bloom et al., 2021; Park et al., 2015). The loss of diverse habitats not only increases dependency on chemical inputs but also diminishes the resilience of bee populations against environmental stressors (Bloom et al., 2021).

The evidence linking pesticide use to bee population declines is robust and multifaceted. Studies consistently show that the application of pesticides correlates with reduced bee abundance and diversity, which in turn affects pollination services critical for agricultural productivity (Baron et al., 2017; Bloom et al., 2021). The ongoing use of harmful pesticides, despite growing awareness of their impacts, poses a significant threat to both managed and wild bee populations, necessitating urgent action to mitigate their use and protect these vital pollinators (Stanley et al., 2016; Gill et al., 2012).

In conclusion, pesticides, particularly neonicotinoids, are indeed responsible for contributing to the decline of bee populations through direct toxicity, impaired cognitive functions, and synergistic effects with pathogens. The interplay of these factors, compounded by habitat loss and agricultural practices, underscores the urgent need for sustainable pest management strategies that safeguard bee health and ensure the continued provision of pollination services.

Not what you expected?

Use longer response

Prioritize newer references

Use abstracts only

Use a table

Scite

#conversation (2)

[← Are pesticides responsible for the disappearance of bees?](#)

✦ Answer

Pesticides applied to agricultural crops have a negative impact on bees, with pyrethroid and neonicotinoid insecticide residues posing the highest risk by contact exposure.

Pesticide Residues and Bees – A Risk Assessment

F. Sánchez-Bayo, K. Goka · 9 avr. 2014

Save

Cite

Share

621 Citations

44 Influential Citations

PLoS ONE

Q1 SJR score

Quality indicators

Rigorous Journal

Highly Cited

✦ Study snapshot

Population	Urban areas (80% urban)
Sample size	50
Methods	Observational
Outcomes	Bees' health and population
Results	Residues of pyrethroids and neonicotinoids pose the highest risk to bees

Generate snapshot

PDF

Full text

Semantic Scholar

✦ Key takeaway

Pesticide residues in pollen and honey pose low overall risks to bees, but pyrethroid and neonicotinoid insecticide residues pose the highest risk by contact exposure and their synergistic toxicity with ergosterol inhibiting fungicides.

Abstract

Bees are essential pollinators of many plants in natural ecosystems and agricultural crops alike. In recent years the decline and disappearance of bee species in the wild and the collapse of honey bee colonies have concerned ecologists and apiculturalists, who search for causes and solutions to this problem. Whilst biological factors such as viral diseases, mite and parasite infections are undoubtedly involved, it is also evident that pesticides applied to agricultural crops have a negative impact on bees. Most risk assessments have focused on direct acute exposure of bees to agrochemicals from spray drift. However, the large number of pesticide residues found in pollen and honey demand a thorough evaluation of all residual compounds so as to identify those of highest risk to bees. Using data from recent residue surveys and toxicity of pesticides to honey and bumble bees, a comprehensive evaluation of risks under current exposure conditions is presented here. Standard risk assessments are complemented with new approaches that take into account time-cumulative effects over time, especially with dietary exposures. Whilst overall risks appear to be low, our analysis indicates that residues of pyrethroid and neonicotinoid insecticides pose the highest risk by contact exposure of bees with contaminated pollen. However, the synergism of ergosterol inhibiting fungicides with those two classes of insecticides results in much higher risks in spite of the low prevalence of their combined residues. Risks by ingestion of contaminated pollen and honey are of some concern for systemic insecticides, particularly imidacloprid and thiamethoxam, chlorpyrifos and the mixtures of cyhalothrin and ergosterol inhibiting fungicides. More attention should be paid to specific residue mixtures that may result in synergistic toxicity to bees.

Ask this paper

Consensus

#multilinguisme

Les pesticides sont-ils responsables de la disparition des abeilles ?

Pro

Filter

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Consensus Meter

Yes67%

Possibly33%

No0%

Buta · 6 papers

Les pesticides jouent un rôle significatif dans la disparition des abeilles, bien que d'autres facteurs contribuent également à ce phénomène.

Impact des Pesticides sur les Abeilles

- **Effets Directs et Indirects:** Les insecticides peuvent tuer directement les abeilles, tandis que les herbicides réduisent la diversité des ressources alimentaires.
- **Exposition Chronique et Synergisme:** L'exposition chronique aux pesticides, en particulier aux pyréthroïdes, peut altérer le comportement et le développement des colonies.
- **Effets Sub-Létaux:** À des doses sub-letales, les pesticides peuvent affecter la cognition des abeilles, compromettant également des altérations du développement.

Interactions avec les Pathogènes

- **Suppression Immunitaire:** Les insecticides peuvent affaiblir le système immunitaire des abeilles, les rendant plus vulnérables aux maladies.
- **Interactions Synergiques:** L'exposition aux pesticides, combinée à d'autres stress environnementaux, peut exacerber les effets négatifs sur les abeilles, tant au niveau larvaire qu'adulte.

Autres Facteurs Contributifs

- **Perte d'Habitat et Stress Alimentaire:** La réduction des habitats naturels et la diminution de la diversité floristique contribuent également au déclin des populations d'abeilles.
- **Changements Climatiques:** Les changements climatiques exacerbent les problèmes en augmentant le stress thermique et en modifiant les cycles de floraison.

Results

1Pestioide Residues and Bees – A Risk Assessment

Unknown

Pesticides applied to agricultural crops have a negative impact on bees, with pyrethroid and neonicotinoid insecticide residues posing the highest risk by contact exposure.

Rigorous Journal

Highly Cited

Ask this paper

2014 · 621 Citations · F. Sánchez-Bayo et al. · PLoS ONE

2Are bee diseases linked to pestioidees? - A brief review.

Yes

Insecticides can directly kill bees and indirectly affect their survival and reproduction, leading to colony collapses and bee declines.

Literature Review

Rigorous Journal

Highly Cited

2016 · 360 Citations · F. Sánchez-Bayo et al. · Environment International

3Bee doelines driven by combined stress from parasites, pestioidees, and lack of flowers

Yes

Chronic exposure to multiple interacting stressors, such as habitat loss, pesticides, and parasites, is driving bee colony losses and declines of wild pollinators.

Highly Cited

Consensus

Papers

Are pesticides responsible for the disappearance of bees?

My Searches

Are pesticides responsible for the disappearance of bees?

Save

Standard

High Quality

fr

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Answer from top 5 papers

Le déclin des populations d'abeilles, en particulier des abeilles domestiques, est de plus en plus lié à l'exposition aux pesticides, qui présente des risques importants pour leur santé et leur survie. Les recherches indiquent que les pesticides, en particulier les néonicotinoïdes et les fongicides, ont des effets néfastes sur les colonies d'abeilles, entraînant une augmentation des taux de mortalité et une altération des fonctions des colonies. Les sections suivantes traitent des impacts spécifiques des pesticides sur les abeilles.

Toxicité des pesticides et mortalité des abeilles

- Des études ont montré que les pesticides courants tels que le fipronil et la lambda-cyhalothrine présentent une toxicité élevée pour les larves d'abeilles domestiques, avec des taux de mortalité pouvant atteindre 94 % dans certaines conditions (Waseem & Thakur, 2023).
- Lors d'études semi-terrain, l'exposition à des néonicotinoïdes combinés à des fongicides a entraîné une augmentation de 2.93 fois de la mortalité et une réduction de l'activité des colonies (Shepherd et al., 2024).

Effets subtils sur le comportement et la cognition

- Les pesticides peuvent altérer des comportements essentiels tels que la recherche de nourriture et la communication, affectant ainsi la capacité des abeilles à jouer leur rôle au sein de la colonie (Pesticide Impact on Bee Behavior).

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Create new column

+ Summarize this article in three key points

+ TLDR

+ Conclusions

+ Summarized Abstract

+ Results

+ Summarized Introduction

+ Methods Used

+ Literature Survey

Journal Article · DOI

1. Effects of common co-occurring pesticides (a neonicotinoid and fungicide) on honey bee colony health in a semi-field study

Sebastian Shepherd · 12 more

01 Apr 2024 · Heliyon

Request PDF

1

2

3

L'étude indique que les pesticides couramment utilisés conjointement, en particulier un néonicotinoïde et un fongicide, ont un effet significatif sur la santé des colonies d'abeilles mellifères, entraînant une augmentation de la mortalité, une réduction de l'activité et des niveaux d'infestation plus élevés, ce qui suggère que les pesticides contribuent au déclin des populations d'abeilles.

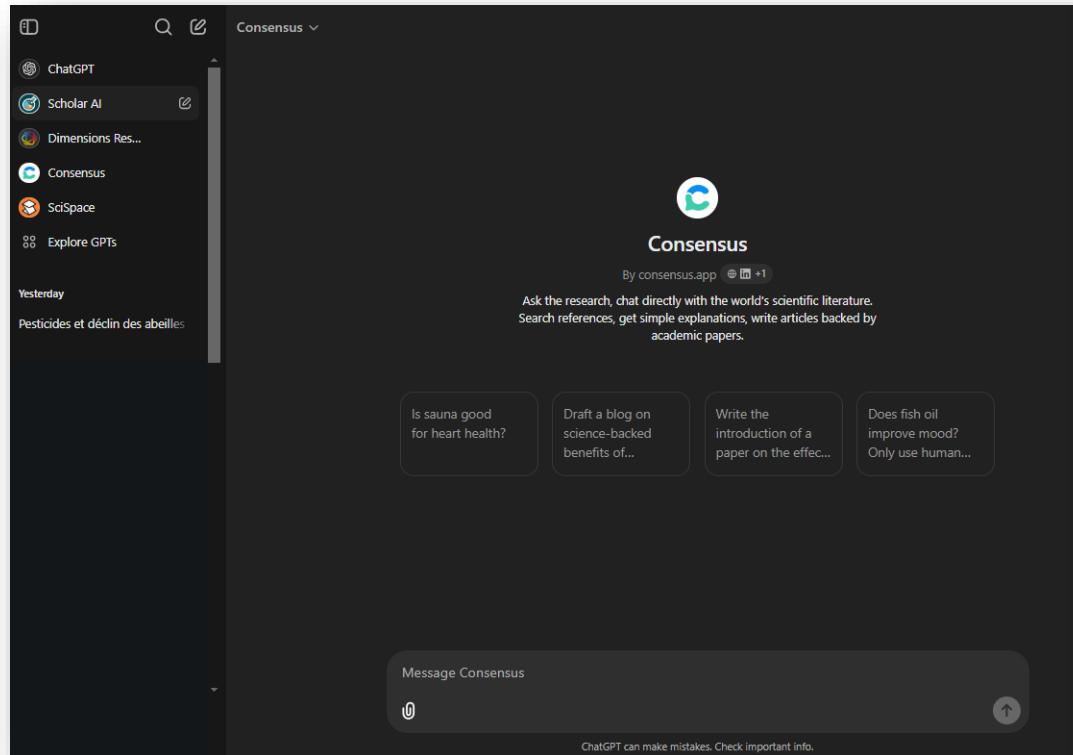
Open access · Book Chapter · DOI

2. Pesticide Impact on Honeybees Declines and Emerging Food Security Crisis

Out, les pesticides sont responsables du déclin des populations d'abeilles. Ils provoquent une toxicité grave, affectent les fonctions

SciSpace

GPTs



Are pesticides responsible for the disappearance of bees?



Talked to chat.consensus.app ▾

Introduction

The disappearance of bees, a phenomenon linked to global declines in pollinator populations, has garnered attention due to its critical impact on ecosystems and agriculture. Research increasingly identifies pesticides, particularly insecticides like neonicotinoids, as contributing factors in bee population declines by impairing bees' health, behavior, and overall colony viability.

Evidence

1. Direct Toxicity and Behavioral Impacts

Pesticides like neonicotinoids and pyrethroids are found in pollen and nectar, exposing bees to sublethal doses that impair their foraging efficiency, cognitive abilities, and pollen collection behavior. Chronic exposure to these substances weakens bees and disrupts colony functions (Gill et al., 2012), (Sánchez-Bayo & Goka, 2014), (Prado et al., 2019).

2. Synergistic Effects with Other Stressors

Pesticides not only weaken bees directly but also interact with other stressors like parasites (e.g., *Nosema ceranae*) and environmental factors to increase vulnerability to disease and mortality. The interaction between pesticides and parasites significantly raises bee mortality and impairs colony health (Goulson et al., 2015), (Doublet et al., 2015).

3. Sublethal Effects on Development and Immune Systems

Sublethal doses of pesticides have been shown to disrupt bees' development, longevity, and immune responses. Studies reveal that pesticide exposure during early life stages harms bee development and gene expression, weakening colonies over time (Christen & Fent, 2017), (Tomé et al., 2019).

4. Exposure to Multiple Residues

Bees in agricultural areas face exposure to numerous pesticide residues, including neonicotinoids in maize pollen, which accumulates within hives and further stresses bee populations. These multi-residue exposures contribute to colony collapse and heighten mortality risks (Krupke et al., 2012).

Conclusion

Overall, pesticides play a significant role in the decline of bee populations by weakening bees, impairing their behaviors, and interacting with other environmental stressors. Reducing pesticide use and exposure, alongside other environmental protections, is crucial to supporting bee populations and, by extension, global ecosystems.

Like our GPT? Try our full AI-powered search engine and academic features for free at consensus.app.



l'IA dans les outils historiques

Scopus AI

The screenshot shows the Scopus AI interface. At the top, there's a navigation bar with 'Search', 'Sources', 'SciVal', and a 'TS' icon. Below this, a 'Start exploring' section encourages users to discover research in one place. A search bar contains the query 'Influence of seismology on civil engineering designs'. The main content area displays an AI-generated overview titled 'Influence of seismology on civil engineering designs'. It includes a numbered list of key points (1-4) and a mind map diagram. The mind map has 'Seismology' at the center, with branches for 'Earthquake monitoring', 'Geotechnical Engineering', 'Earthquake', 'Structural analysis', 'Civil Engineering', and 'Seismic Design'. Each branch has further sub-points. For example, 'Earthquake monitoring' leads to 'Earthquake monitoring' (4), 'Geotechnical Engineering' leads to 'Damage Study' and 'Impact', 'Earthquake' leads to 'Research' and 'Sustainability', 'Structural analysis' leads to 'Innovation', 'Civil Engineering' leads to 'Sustainability', and 'Seismic Design' leads to 'Innovation'. The interface also includes a 'Show all references' link and a 'Rate this summary' button.

Web of Science Research Assistant

The screenshot shows the Web of Science Research Assistant interface. At the top, there's a navigation bar with 'Clarivate', 'Web of Science', 'Search', and 'Research Assistant'. Below this, a 'DOCUMENTS' section features a search bar with the placeholder text 'Search for documents by entering topics, authors, institutions, funders' and a 'Search' button. A 'RESEARCHERS' section is also visible. The main content area is divided into two columns. The left column, titled 'Let Research Assistant talk you through it', promotes the Research Assistant chatbot and includes a 'Get started with Research Assistant' button. The right column, titled 'Sign in to Personalize your experience', lists benefits of signing in, such as saving searches, managing profiles, and receiving alerts. It includes a 'Register now' button. At the bottom, a banner encourages users to jump back into their research and try out the personalized homepage dashboard, with a 'Sign in to access' button.

GenAI Tools for Literature Reviews

3.

Write & Cite



Common activities

- Synthesize findings from various sources
- Write narratives that support the arguments
- Cite references properly

Research tools

Writing

MS Word Overleaf (LaTeX)

Grammar check & Paraphrasing

Grammarly Quillbot

Similarity check

Turnitin iThenticate

Citing references

Zotero EndNote
Mendeley JabRef (LaTeX)

How AI can help

Synthesize findings

Elicit Scite Assistant Poe

Draft the outline & Improve writing

Notion AI ChatGPT
Poe (Claude / GPT-4o)

assistants

dans les navigateurs

Pesticide Residues and Bees – A Risk Assessm... < 1 / 16 > | 86% + | ↻ 🔍 🗨️ 🏠 ⬇️ 🖨️ ⋮

☰ 📄 📁 ⌵

- Abstract
- Introduction
- Materials and Methods
 - Residues Data
 - Toxicity Data
 - Data Analysis
- Results
 - Residue Data
 - Risk by Contact Exposure
 - Risk by Dietary Exposure
 - Risks by Cumulative Toxicity
- Discussion
- Conclusions
- Supporting Information
- Acknowledgments
- Author Contributions
- References

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Pesticide Residues and Bees – A Risk Assessment

Francisco Sanchez-Bayo^{1*}, Koichi Goka²

¹ Faculty of Agriculture and Environment, The University of Sydney, Eveleigh, New South Wales, Australia, ² National Institute for Environmental Sciences, Tsukuba, Ibaraki, Japan

Abstract

Bees are essential pollinators of many plants in natural ecosystems and agricultural crops alike. In recent years the decline and disappearance of bee species in the wild and the collapse of honey bee colonies have concerned ecologists and apiculturalists, who search for causes and solutions to this problem. Whilst biological factors such as viral diseases, mite and parasite infections are undoubtedly involved, it is also evident that pesticides applied to agricultural crops have a negative impact on bees. Most risk assessments have focused on direct acute exposure of bees to agrochemicals from spray drift. However, the large number of pesticide residues found in pollen and honey demand a thorough evaluation of all residual compounds so as to identify those of highest risk to bees. Using data from recent residue surveys and toxicity of pesticides to honey and bumble bees, a comprehensive evaluation of risks under current exposure conditions is presented here. Standard risk assessments are complemented with new approaches that take into account time-cumulative effects over time, especially with dietary exposures. Whilst overall risks appear to be low, our analysis indicates that residues of pyrethroid and neonicotinoid insecticides pose the highest risk by contact exposure of bees with contaminated pollen. However, the synergism of ergosterol inhibiting fungicides with those two classes of insecticides results in much higher risks in spite of the low prevalence of their combined residues. Risks by ingestion of contaminated pollen and honey are of some concern for systemic insecticides, particularly imidacloprid and thiamethoxam, chlorpyrifos and the mixtures of cyhalothrin and ergosterol inhibiting fungicides. More attention should be paid to specific residue mixtures that may result in synergistic toxicity to bees.

Citation: Sanchez-Bayo F, Goka K (2014) Pesticide Residues and Bees – A Risk Assessment. PLoS ONE 9(4): e94482. doi:10.1371/journal.pone.0094482

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Competing Interests: The authors have declared that no competing interests exist.

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Introduction

Growing concern about the impact of pesticides on pollinators is reflected in the enormous literature on the topic in the past few years [1]. In response to this concern, considerable amounts of new data on toxic effects of pesticides on wild bees, in particular bumble bees, have been obtained from laboratory and semi-field experiments [2–3].

A number of reviews on the topic have highlighted the importance of bees as natural pollinators not only for our crops but also for wildflowers and plants of forests and tropical ecosystems [4,5]. That is why the current declining trend of pollinators is worrying [6]. For example, it has been estimated that without bees, some 60 species of crop plants would fail to produce fruit [7]; the economic consequences of this impact are obvious. Importation of bumble bees to make up for the losses of pollinators in the areas affected not only does not solve the issue but also creates more problems by exporting parasites to other regions or countries [8,9] or competing with native species [10].

low levels of pesticides may act as stressors that make bees more prone to biological infections [3,18,19]. Among the pesticides, newly developed systemic insecticides such as fipronil and neonicotinoids have been targeted as the main culprits involved in the collapses since they were launched to the market in the mid-1990s [20,21,22,23].

Biological factors have been responsible for many of the problems that beekeepers have with their bee hives [24], but they are unlikely to be the main cause of disappearance of a number of wild bee species, or the decline of bumble bees in North America and Europe in recent years [12,24]. Although there are scant data on bee populations from other parts of the world to make a proper evaluation, the fact that bee declines have been observed in countries that have a long history of using pesticides in agriculture points to these agrochemicals as one of the important factors underlying wild bee and honey bee colony losses. To resolve this issue, several surveys have been carried out in recent years in North America [26,27,28], France [29,30], Spain [31] and India [32] among others, to find out the amounts and prevalence of

extension Google scholar PDF reader (Chrome)

☰ 📄 📁 ⌵

Introduction

- Describes the growing concern about the decline of bee species.
- Highlights the importance of bees as pollinators and the impact of their decline.
- Mentions factors contributing to honey bee declines, including biological diseases and pesticides.
- Presents the need for comprehensive risk assessments of pollen and honey.

Materials and Methods

- Notes that the assessment focuses on honey bees (*Bombus* spp.)
- Lists sources of data on pesticide residues in pollen and honey.
- Presents sources of acute oral and contact toxicity data for bumble bees.
- Describes the standard risk assessment methods used for pesticide residue detection.
- Discusses the estimation of synergistic effects of multiple pesticides.
- Presents two novel approaches for assessing cumulative risk: approach and the time-cumulative effect.

Results

- Presents the residue data, showing the highest residues in pollen and the most frequent detection in honey.
- Discusses the risk by contact exposure of bees with contaminated pollen, moderate, and low risks for honey bees.
- Discusses the dietary risk to honey bees from contaminated pollen, moderate, and low risks for larvae, nectar, and honey.

dans les traitements de texte

The screenshot displays the Keenious web application. The main interface consists of a text editor on the left and a sidebar on the right. The text editor has a menu bar (File, Edit, View, Insert, Format, Tools, Extensions, Help) and a toolbar with various editing tools. The text "Are pesticides responsible for the disappearance of bees?" is entered into the editor. The sidebar on the right is titled "Keenious" and contains a search bar, a "Sign In" button, and a list of search results. The search results are filtered by "Highlighted 'Are pesticides respo...'" and show 1000 results based on 100% of the document. The results list includes articles, reviews, and their respective citation counts.

Type	Title	Year	Journal	Citations
Article	Past insecticide exposure reduces bee reproduction and population growth rate	2021	Proceedings of the National Academy of Sciences	57
Review	Lethal, sublethal, and combined effects of pesticides on bees: A meta-analysis and new risk assessment tools	2022	The Science of The Total Environment	76
Article	Exposure of native bees foraging in an agricultural landscape to current-use pesticides	2016	The Science of The Total Environment	189
Article	Pesticide exposure of wild bees and honey bees foraging from field border flowers in intensively managed agriculture areas	2022	The Science of The Total Environment	42
Article	Negative effects of pesticides on wild bee communities can be buffered by landscape context			

[extension Keenious](#)

DÉROULÉ

- La recherche bibliographique à l'heure sémantique et conversationnelle
- Une fonctionnalité de plus en plus standard
- **État des lieux actuel**

#risques

AI is expected to bring many benefits

Researchers and clinicians recognise AI's potential. Almost all respondents expect AI to have to some positive impact in key areas. They believe it will help...

95%

A horizontal bar chart with an orange bar representing 95% of the total length. The bar is followed by a grey segment representing the remaining 5%.

Accelerate knowledge discovery.

94%

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Rapidly increase the volume of scholarly and medical research.

92%

A horizontal bar chart with an orange bar representing 92% of the total length. The bar is followed by a grey segment representing the remaining 8%.

Provide cost savings to institutions and businesses.

87%

A horizontal bar chart with an orange bar representing 87% of the total length. The bar is followed by a grey segment representing the remaining 13%.

Increase work quality overall.

Elicit results

1.4 hours

saved per user per week

On average, users say that Elicit saves them 1.4 hours per week. 10% of users say Elicit saves them 5 or more hours per week.

96% recall

screening papers

When screening papers for a systematic review, Elicit achieved 96%+ recall over 5,000 papers. Trained research assistants and staff only achieved 92%.

98% accuracy

for data extraction

In our testing, Elicit was 98% accurate when extracting data. Trained staff were only 72% accurate. When Elicit may not be accurate, we show a flag so that users can double check Elicit's work.

**13-26% more
accurate**

than manual data extraction

Elicit's data extraction accuracy was 13-26% higher (in absolute percentage points) than manual extraction by trained staff.

Note: Accuracy statistics vary by task.

[source](#)

Multiple negative impacts are also expected

While they identify numerous benefits, these are balanced by concerns about potential drawbacks, including misinformation, and causing errors. They believe it has the potential to....

94%

Be used for misinformation.

86%

Cause critical errors or mishaps.

81%

Erode critical thinking skills.

79%

Cause disruption to society.

Artificial intelligence and illusions of understanding in scientific research

[Lisa Messeri](#)  & [M. J. Crockett](#) [Nature](#) **627**, 49–58 (2024) | [Cite this article](#)**48k** Accesses | **61** Citations | **913** Altmetric | [Metrics](#)

Abstract

Scientists are enthusiastically imagining ways in which artificial intelligence (AI) tools might improve research. Why are AI tools so attractive and what are the risks of implementing them across the research pipeline? Here we develop a taxonomy of scientists' visions for AI, observing that their appeal comes from promises to improve productivity and objectivity by overcoming human shortcomings. But proposed AI solutions can also exploit our cognitive limitations, making us vulnerable to illusions of understanding in which we believe we understand more about the world than we actually do. Such illusions obscure the scientific community's ability to see the formation of scientific monocultures, in which some types of methods, questions and viewpoints come to dominate alternative approaches, making science less innovative and more vulnerable to errors. The proliferation of AI tools in science risks introducing a phase of scientific enquiry in which we produce more but understand less. By analysing the appeal of these tools, we provide a framework for advancing discussions of responsible knowledge production in the age of AI.

[L. Messeri et M. J. Crockett, 03/2024](#)

Guest Post – There is More to Reliable Chatbots than Providing Scientific References: The Case of ScopusAI

By [TERESA KUBACKA](#) | FEB 21, 2024 | 2 COMMENTS[ARTIFICIAL INTELLIGENCE](#) | [CONTROVERSIAL TOPICS](#) | [EXPERIMENTATION](#) | [INNOVATION](#) | [RESEARCH](#) | [TECHNOLOGY](#) | [TOOLS](#)

Editor's Note: Today's post is by Teresa Kubacka. Teresa is a senior data scientist in the Knowledge Management Group at the ETH Library (ETH Zurich) and leads a project "Towards Open Bibliometric Indicators". The article reflects her personal experience and opinions. All tests described in the article were performed in October 2023 at a point when ScopusAI was in its Beta version.

Last summer, Scopus announced the release of a new tool, ScopusAI, integrated with their bibliometric database. Citing the [documentation](#), "Scopus AI is an AI-driven research tool that uses the Scopus peer-reviewed research repository to help users understand and navigate unfamiliar academic content". The tool consists of a chatbot interface, which accepts prompts in natural language and provides several sentence-long answers with citations drawn from the Scopus database. Users can type a follow-up question or pick a suggested question from a list. Additionally, the tool creates a visualization of keywords, a functionality not rolled out fully at the time of writing this article.

How does ScopusAI work in the background? From the [official documentation](#), we can infer that ScopusAI follows a Retrieval-Augmented Generation (RAG) architecture and consists of two machine learning (ML) components. One component retrieves relevant documents published between 2018 and 2023 and indexed in Scopus. It is built differently than the default Scopus search: it is used to match the user input with single sentences contained in available abstracts. It is suggested that [other article metadata are also being used to rank the results](#). Once the few best-matching abstracts are identified, another ML component – a generative large language model (LLM) [likely from a GPT family](#) – rephrases them into an answer to the original question.

OFFICIAL BLOG OF:



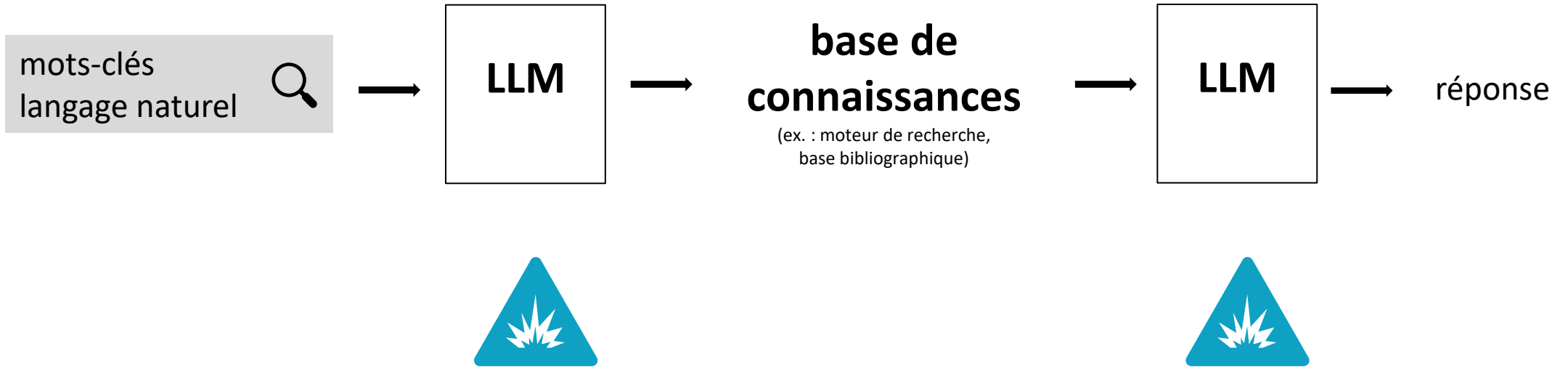
THE CHEFS

[T. Kubacka, 02/2024](#)

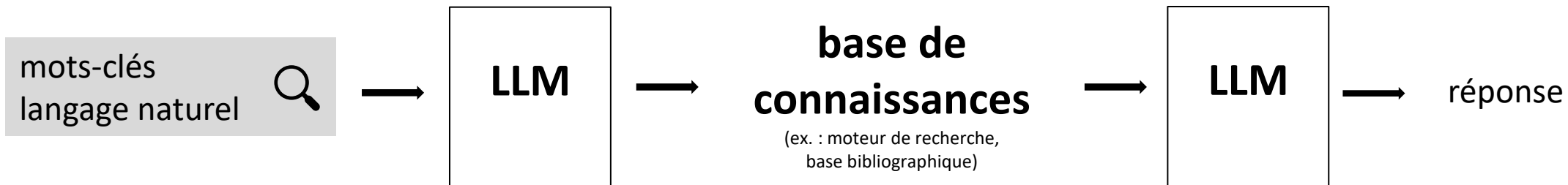
#What could possibly go wrong?

RAG (*retrieval augmented generation*)

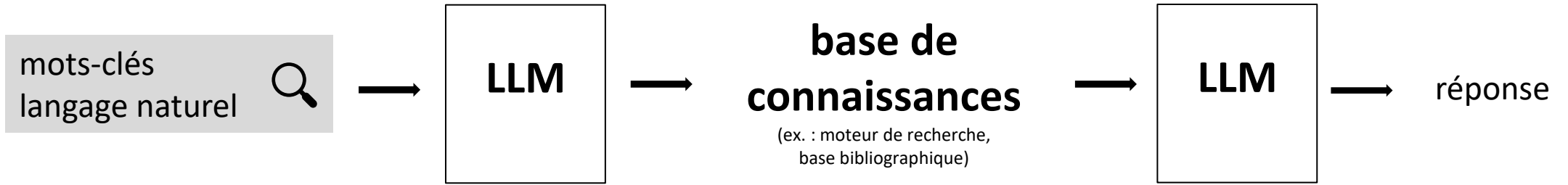




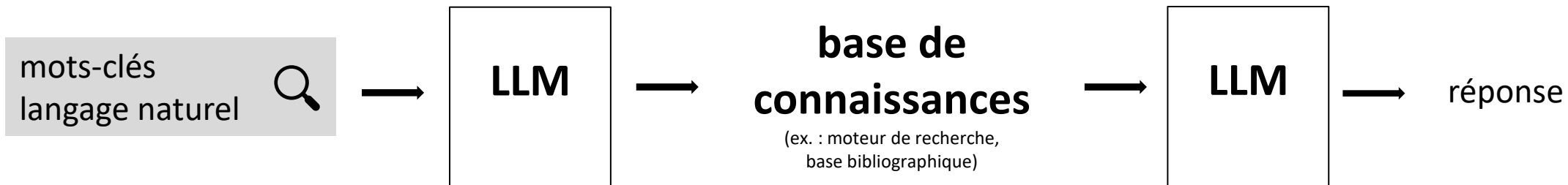
#données d'entraînement des LLM
#hallucinations
#boîtes noires



#données couvertes
#données utilisées
#jardins fermés



#construction de la requête
~~#prompt~~



#classement
#représentativité
#fiabilité

Est-ce que le karaté peut améliorer le bien-être ?



Talked to ai-api.dimensions.ai ▾

La pratique du karaté peut améliorer le bien-être, comme le montrent plusieurs études récentes. Une étude menée par Jansen et al. (2016) a révélé que l'entraînement au karaté améliore la santé mentale subjective et réduit l'anxiété chez les adultes plus âgés (Jansen, 2016). De même, une autre étude a démontré des effets positifs sur le bien-être émotionnel des personnes âgées, incluant une amélioration de l'estime de soi et de la performance cognitive après un entraînement de karaté (Jansen, 2012).

En conclusion, le karaté est associé à une amélioration du bien-être émotionnel, du contrôle de soi et de la qualité de vie à travers diverses populations, avec plus de 9 000 publications disponibles sur ce sujet.

Can karate improve well-being?



Talked to ai-api.dimensions.ai ▾

Karate has been shown to improve well-being in various populations. Studies indicate that karate training enhances emotional well-being, reduces anxiety, and boosts cognitive performance, especially in older adults (Jansen, 2016). It can also positively impact life satisfaction by improving self-control and emotional regulation (Potoczny, 2022). Additionally, karate improves mood and balance, making it beneficial even for individuals with Parkinson's disease (Dahmen-Zimmer, 2017).

In conclusion, karate offers several mental and physical benefits, with over 9,300 relevant publications affirming its positive effects on well-being.

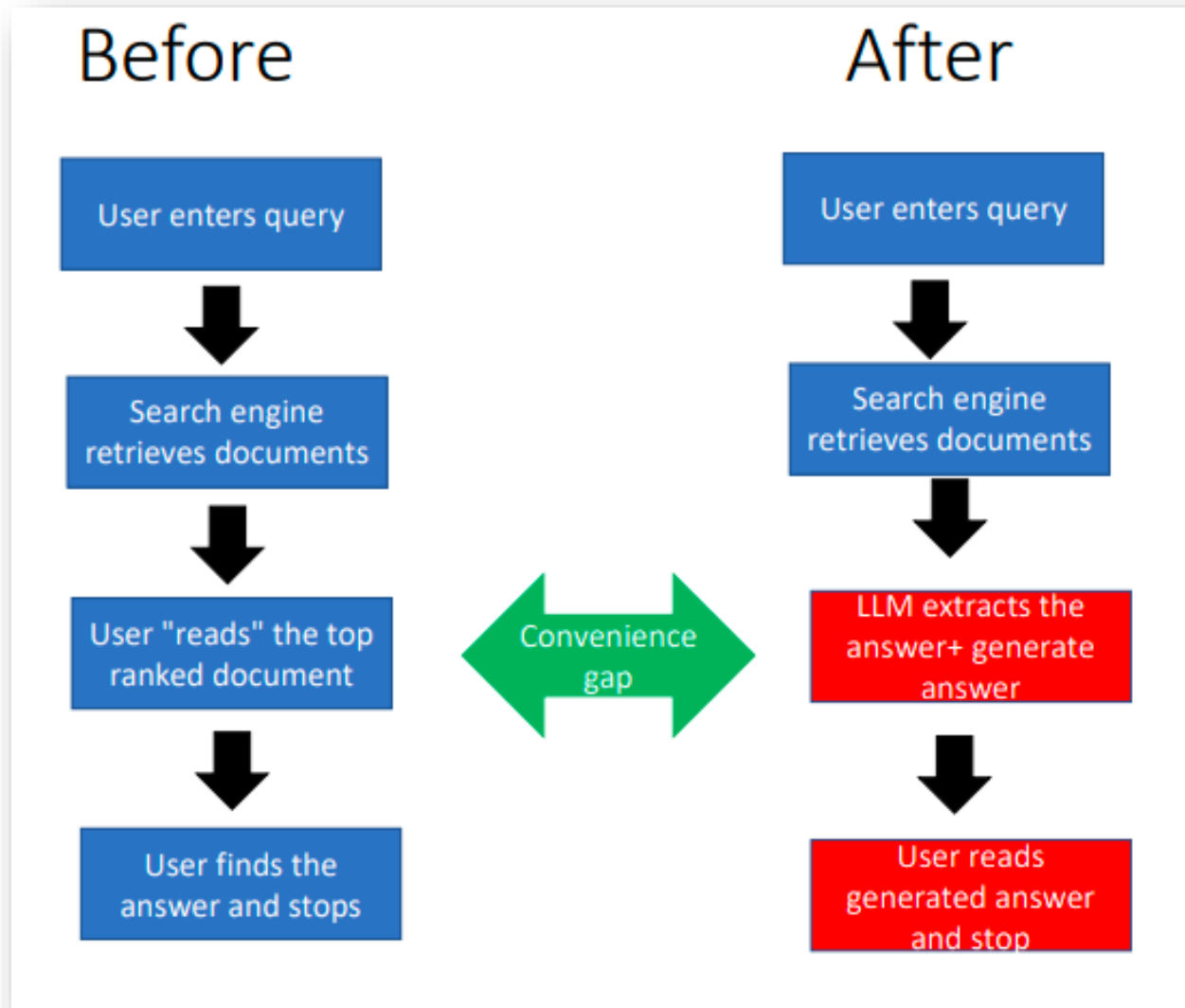
#risques épistémiques

« *epistemic trespassing* »

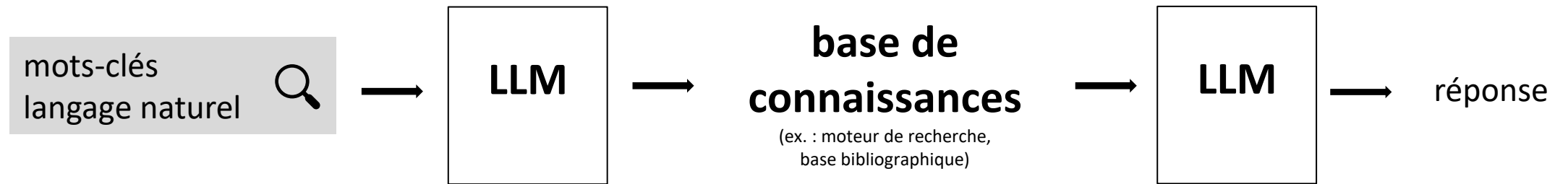
« *illusions of understanding* »

« *cherry picking* »

#changements de méthodes ?



RAG (*retrieval augmented generation*)



- 
- sélection de l'outil
 - définition de la question
 - **réflexion scientifique**
 - **instructions (assistant)**

- 
- évaluation
 - interactions avec l'outil
 - diversification des outils
 - **responsabilité des usages**

The use of generative AI and AI-assisted technologies in writing for Elsevier

Policy for Book and Commissioned Content Authors

This policy aims to provide greater transparency and guidance to authors, readers, reviewers, editors in relation to generative AI and AI-assisted technologies. Elsevier will monitor this development and will adjust or refine this policy when appropriate. Please note the policy only refers to the writing process, and not to the use of AI tools to analyze and draw insights from data as part of the research process.

Where authors use AI and AI-assisted technologies in the writing process, these technologies should only be used to improve readability and language of the work and not to replace key authoring tasks such as producing scientific, pedagogic, or medical insights, drawing scientific conclusions, or providing clinical recommendations. Applying the technology should be done with human oversight and control and all work should be reviewed and edited carefully, because AI can generate authoritative-sounding output that can be incorrect, incomplete, or biased. The authors are ultimately responsible and accountable for the contents of the work.

Authors should disclose in their manuscript the use of AI and AI-assisted technologies and a statement will appear in the published work. Declaring the use of these technologies supports transparency and trust between authors, readers, reviewers, editors, and

« Please note the policy only refers to the writing process, and not to the use of AI tools to analyze and draw insights from data as part of the research process. »

« This policy does not relate to tools such as spelling or grammar checkers. In addition, the policy does not cover reference managers that enable authors to collect, organize, annotate, and use references to scholarly articles – such as Mendeley, EndNote, Zotero and others. These tools can be used by authors without disclosure. This policy is specific to AI and AI-assisted tools, such as Large Language Models, which can generate output that may be used to create original content for publication. »

#Search vs Discovery

The screenshot shows the Web of Science Research Assistant interface. At the top, the Clarivate logo is on the left, and 'Eng' and 'Sig' are on the right. Below the logo, 'Web of Science™' is displayed. A navigation bar contains 'Search' and 'Research Assistant', with the latter highlighted by a red box. On the left side, there is a vertical menu with icons for 'MENU', a document, a clock, a person, and a bell. The main content area is divided into two tabs: 'DOCUMENTS' (active) and 'RESEARCHERS'. Under the 'DOCUMENTS' tab, there is a toggle switch for 'Smart Search BETA' (which is turned off) and 'Advanced Search'. Below this is a search input field with the placeholder text 'Search for documents by entering topics, authors, institutions, funders' and a red 'Search' button. The interface also features several promotional cards. One card titled 'Let Research Assistant talk you through it' describes the 'Advanced technology to help you understand your topic and find resources faster.' and includes a 'Get started with Research Assistant' button. Another card titled 'Sign in to Personalize your experience' lists benefits like saving searches, managing profiles, and receiving alerts, with a 'Register now' button. A third card at the bottom encourages users to 'Jump back into your research - try out our personalized homepage dashboard' and provides a link to 'Register for a new account' if they don't have one, along with a 'Sign in to access' button.

Clarivate

Web of Science™

Search Research Assistant

DOCUMENTS

RESEARCHERS

Smart Search BETA Advanced Search

Search for documents by entering topics, authors, institutions, funders

Search

Let Research Assistant talk you through it

Advanced technology to help you understand your topic and find resources faster.

Get started with Research Assistant

Understand a topic

Literature review

Find a journal

Start a new chat

Sign in to Personalize your experience

- Save searches
- Save and organize documents to lists
- Receive alerts when new publications match your search
- Manage your profile
- Get alerted when your publications are cited
- Get personalized suggested content

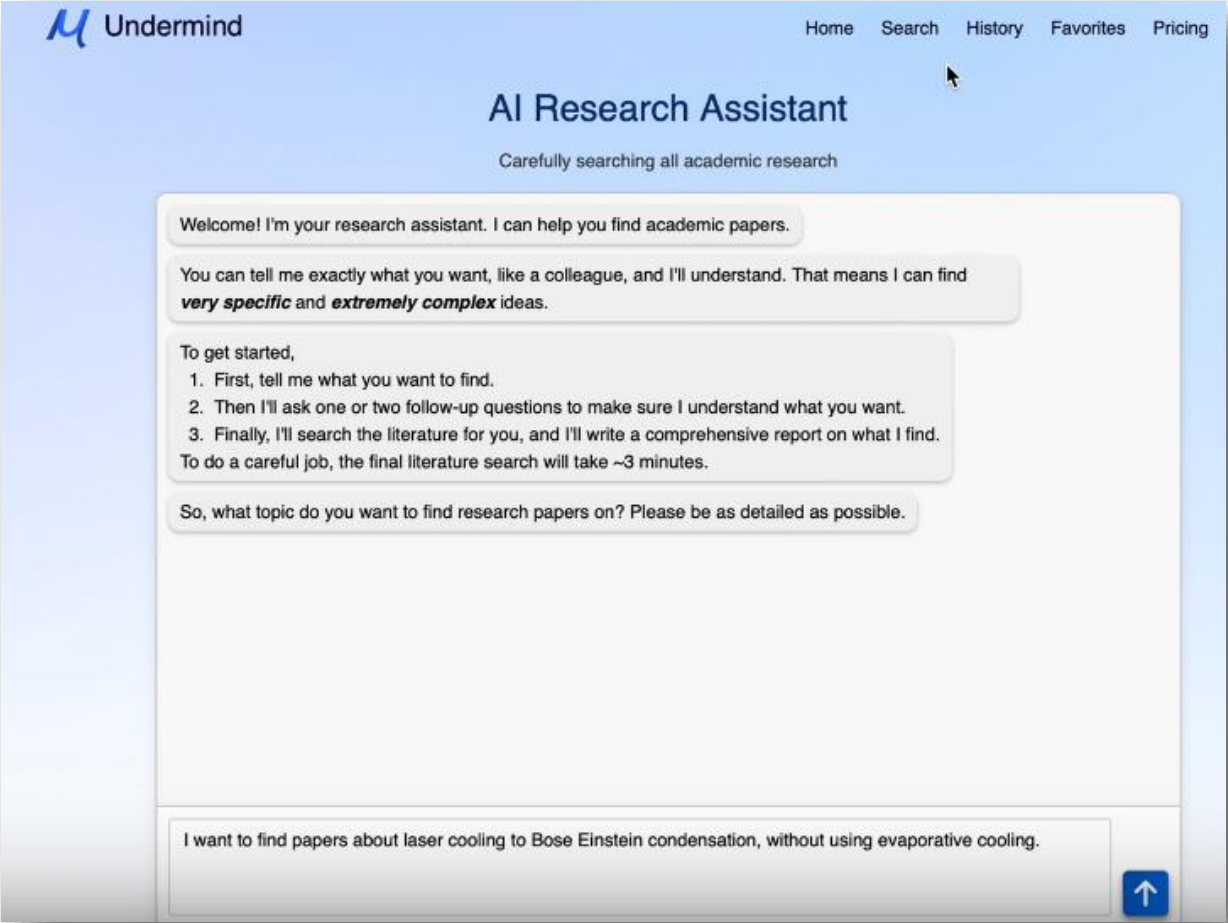
Register now

Jump back into your research - try out our personalized homepage dashboard.

Don't have an account? [Register for a new account](#)

Sign in to access

#L'ère des assistants personnels



<https://undermind.ai/>
(Undermind)

To get started,
1. First, tell me what you want to find.
2. Then I'll ask one or two follow-up questions to make sure I understand what you want.
3. Finally, I'll search the literature for you, and I'll write a comprehensive report on what I find.
To do a careful job, the final literature search will take ~3 minutes.

So, what topic do you want to find research papers on? Please be as detailed as possible.

I want to find papers about laser cooling to Bose Einstein condensation, without using evaporative cooling.

So, you're interested in the non-evaporative paths to achieving Bose-Einstein condensates through laser cooling, which is a pretty innovative approach given the typical reliance on evaporative cooling to achieve sufficiently low temperatures.

Could you specify any particular techniques or methods within laser cooling that you're most interested in? For instance, are you looking for implementations using specific atoms or is there a certain aspect of the method, such as Doppler cooling, that is crucial for your search?

Lastly, are you focusing on theoretical models, experimental results, or a combination of both? Clarifying this will help narrow down whether you need papers that present new experimental data, theoretical frameworks, or comprehensive reviews on the subject.

Research Topic

I want to find papers about laser cooling an ensemble of ultra cold atoms to quantum degeneracy or BEC. Have people accomplished this? Why do people want to do laser cooling instead of using evaporative cooling to reach BEC?

Share this search Save to favorites: How was this search? Excellent Good Ok Bad

Summary

Laser cooling has been successfully used to achieve quantum degeneracy and Bose-Einstein Condensation (BEC) in various atomic species, as demonstrated in multiple studies [1, 2, 3, 4, 5], with significant advantages over evaporative cooling including higher atom numbers, faster cooling times, and minimal atom loss.

- **Direct Achievements of BEC Through Laser Cooling:**
 - **Strontium:** Stellmer et al. (2013) demonstrated BEC in strontium atoms using continuous Doppler cooling on a narrow-linewidth transition, achieving condensates of up to 10^5 atoms [1].
 - **Rubidium-87:** Unvoy et al. (2019) presented a method to produce BEC of ^{87}Rb atoms using Raman cooling in a dipole trap, achieving condensation with 2.5×10^4 atoms at $0.6 \mu\text{K}$ [2]. Similarly, Hu et al. (2017) achieved BEC with ^{87}Rb atoms using a 2D optical lattice and Raman sideband cooling [4].
 - **Machine Learning Optimization:** Xu et al. (2023) utilized polarization gradient cooling along with machine learning to optimize parameters, forming a small BEC of ~250 ^{87}Rb atoms in 40 ms [3]. Vendeiro et al. (2022) also applied machine learning to expedite the BEC formation process by optimizing Raman cooling parameters [21].
- **Sub-Recoil and Advanced Cooling Techniques:**
 - **Narrow-Line Cooling:** Several studies, such as Katori et al. (2000) [11] and Bennetts et al. (2017) [9], have discussed the use of narrow intercombination lines and efficient cooling schemes that approach, but may not directly reach, the quantum degeneracy regime.

So far, I've closely analyzed 220 of the most promising papers, and I've found ~14-27 that are relevant, which is probably **more than 90%** of all that exist.
To get this estimate, we do a statistical [analysis](#) of the discovery process.
I've only analyzed 220 papers. If I keep searching, I may find more that are relevant. If you want, I can analyze 120 more of the next best results for you: [Extend search](#)

References

Toggle all abstracts Export all data Show only: Last 5 years Last 2 years > 1 citation per year > 5 citations per year

Topic Match	Cit./Year	Year	Paper	Paper Relevance Summary
100.0%	11.6	2013	[1] Laser cooling to quantum degeneracy. S. Stellmer, ..., and F. Schreck Physical review letters 2013 - 134 citations - Show abstract - 44 Cite - PDF	Provides evidence of reaching BEC using laser cooling alone. Demonstrates BEC in strontium atoms through continuous Doppler cooling on a narrow-linewidth transition below $1 \mu\text{K}$. Achieves condensates of up to 10^5 atoms, highlighting practical and repeated application within 100 ms.

L'IA GÉNÉRATIVE AU CŒUR DES OUTILS
DE RECHERCHE DE LITTÉRATURE ACADÉMIQUE
ASSISTANCE OU RISQUE POUR LA SCIENCE ?



3 prédictions pour 2027 ([A. Tay](#))

1. la recherche sémantique va devenir si efficace qu'il faudra s'adapter, même si elle est moins transparente
2. l'extraction d'informations sera de plus en plus populaire (dans un 1^{er} ou un 2nd temps de la recherche ?)
3. les agents de recherche commenceront à se développer

“Not for the lazy”
([Elsevier](#))

recherche par mots-clés

mots-clés, booléens



recherche par co-citations

références et
citations d'une publication



recherche sémantique

langage naturel



BIBLIOGRAPHIE

Support issu de :

Au-delà de ChatGPT : recherche d'informations académiques et intelligence artificielle,
<https://urfist.chartes.psl.eu/ressources/au-dela-de-chatgpt-recherche-d-informations-academiques-et-intelligence-artificielle>,
présence d'une bibliographie

complété de :

- Aaron Tay. *Mega databases, AI and semantic searches: magic buzz words or something real there?* Information Retrieval Meeting (IRM 2024), Cologne, 26/04/2024. <https://www.iqwig.de/en/events/information-retrieval-meeting/>.
- Aster Zhao. *Emerging AI Tools for Literature Review*. 11/2024. <https://libguides.hkust.edu.hk/AI-tools-literature-review/overview>. dont support de presentation : <https://libguides.hkust.edu.hk/AI-tools-literature-review/workshop>.

Illustration de conclusion : ChatGPT 4o, prompt “An illustration of multiple researchers in a collaborative, modern office environment using generative AI on computers to search for bibliographic references”, 08/11/2024

