RESEARCH AND ARTICLE

Presented by : Dr. Zohre Eftekhari

Associate Professor , Biotechnology Department,

Pasteur Institute of Iran

RESEARCH?

2

Definition of Research

- Research : the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings.
- The term 'research' combines 're' (again) and 'search' (find), implying a continuous activity of looking for new information or re-examining existing knowledge.
- It is a structured inquiry using acceptable scientific methodology to solve problems and create new, generally applicable knowledge.
- This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes.

❑ **Activities that support the conduct of research and therefore meet the definition of research include:**

✓ professional, technical, administrative or clerical support staff directly engaged in activities essential to the conduct of research

✓ management of staff who are either directly engaged in the conduct of research or are providing professional, technical, administrative or clerical support or assistance to those staff

✓ the activities and training of HDR students enrolled at the Higher Education Programs (HEP)

✓ the development of HDR training and courses

✓ the supervision of students enrolled at the HEP and undertaking HDR training and courses

✓ research and experimental development into applications software, new programming languages and new operating systems (such R&D would normally meet the definition of research)

❑ **Activities that do not support the conduct of research must be excluded, such as:**

✓ scientific and technical information services

✓ general purpose or routine data collection

✓ standardization and routine testing

✓ feasibility studies (except into research and experimental development projects)

✓ specialized routine medical care

✓ commercial, legal and administrative aspects of patenting, copyright or licensing activities

✓ routine computer programming, systems work or software maintenance.

Types of Research

Based on Application

Pure/Basic/Fundamental Research aims to expand existing scientific knowledge and develop theories, often without immediate practical application.

Applied/Decisional Research uses fundamental research to solve specific, practical problems, aiding policy formulation and understanding phenomena.

Based on Objectives

Descriptive Research explains situations, problems, or phenomena, or provides information, often systematic and used to answer '**who, what, when, where, and how**' questions.

Correlational Research measures two variables to assess their statistical relationship without external influence.

Explanatory Research explains why events occur, building or testing theories, and is concerned with showcasing and presenting existing knowledge.

Exploratory Research seeks solutions for problems not clearly studied, establishing priorities, developing operational definitions, and improving research design.

Based on Inquiry Mode

Structured Approach (Quantitative Research) predetermines research objectives, design, sample, and questions, suitable for quantifying variations.

Unstructured Approach (Qualitative Research) allows flexibility, suitable for exploring the nature of a problem without quantifying it.

Other Types

Analytical Research uses existing facts to critically evaluate material.

Quantitative Research measures quantity or amount, applicable to phenomena expressed numerically.

Qualitative Research concerns qualitative phenomena (quality or kind), exploring meanings and understandings of complex social environments.

Conceptual Research is theoretical, used by philosophers to develop new concepts or understand existing ones.

Empirical Research is data-based, relying on experience or observation, and is verifiable through experiment.

❑ Primary vs. Secondary Research:

- **Primary Research:** Involves conducting new studies and collecting original data.
- **Secondary Research:** Involves analyzing and synthesizing data that has already been collected and published, such as systematic reviews and meta-analyses.

❑ Main Areas of Medical Research:

- **Basic/Laboratory Research:** Focuses on the fundamental biological mechanisms of diseases and treatments through experimentation in controlled environments, laying the foundation for other research types.
- **Clinical Research:** Investigates the effects of specific interventions or conditions on individuals, often involving human participants.
- **Epidemiological Research:** Examines the distribution, causes, and control of diseases in human populations, focusing on factors like exposure and risk.

❑ Types of Clinical Research:

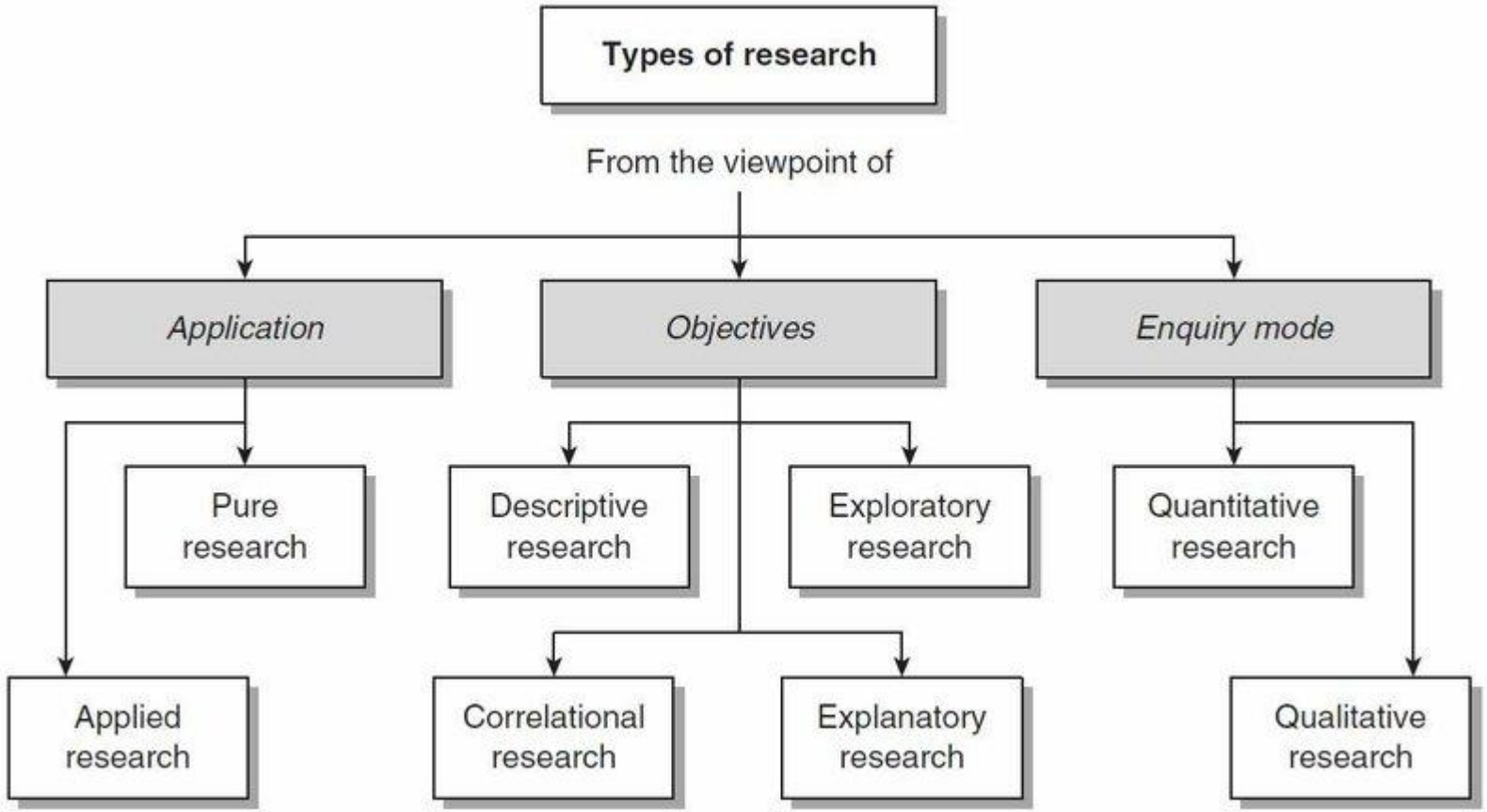
- **Observational Studies:**
- Involve observing and gathering information on human behavior and health data without intervention or new treatments.
- Examples include:
- **Cohort Studies:** Follow a group of individuals over time to observe health outcomes related to specific factors.
- **Case-Control Studies:** Compare individuals with a particular condition (cases) to those without (controls) to identify potential risk factors.
- **Cross-Sectional Studies:** Analyze data from a population at a single point in time to understand the prevalence of conditions and exposures.

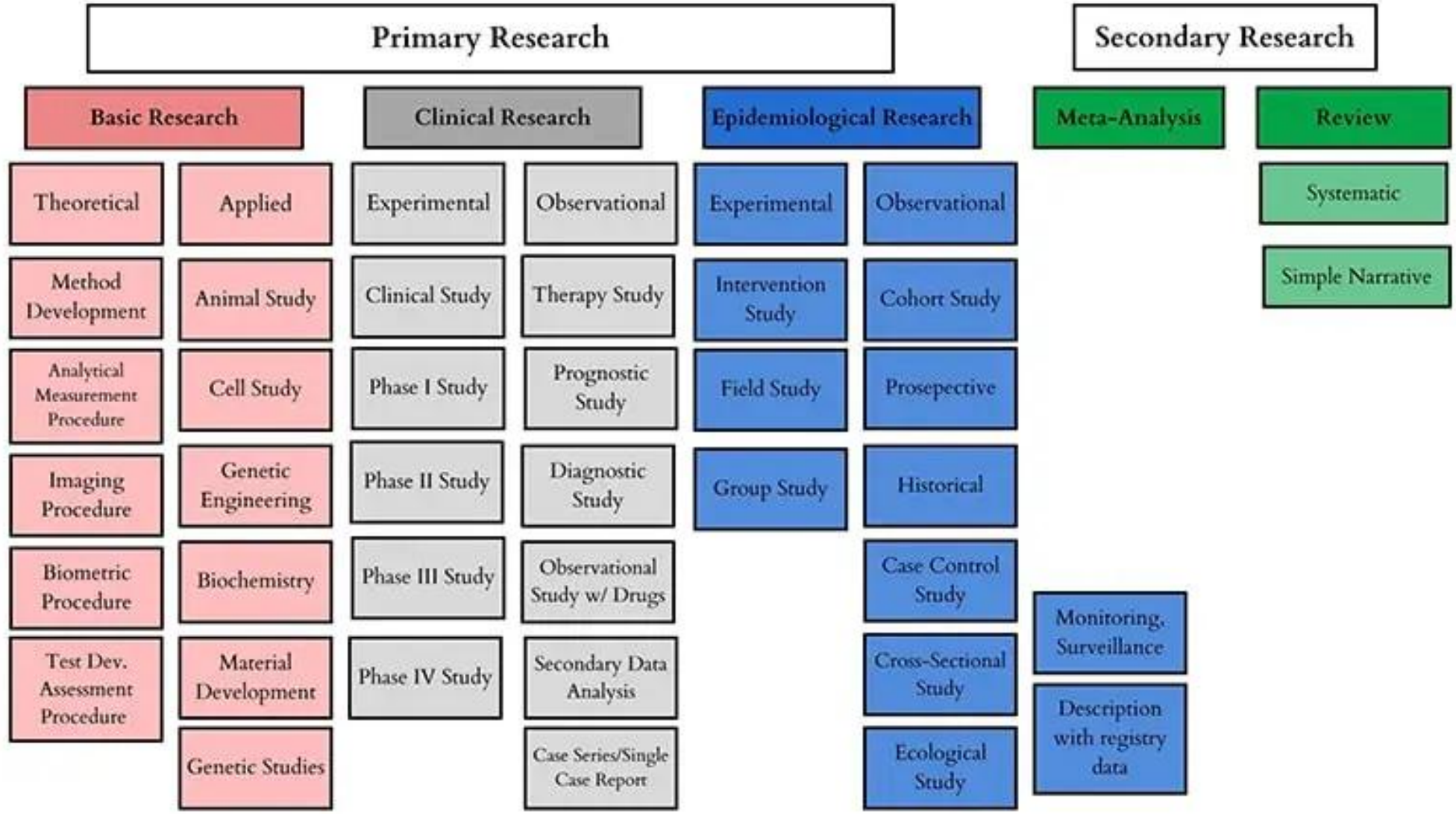
❑ Interventional Studies (Clinical Trials):

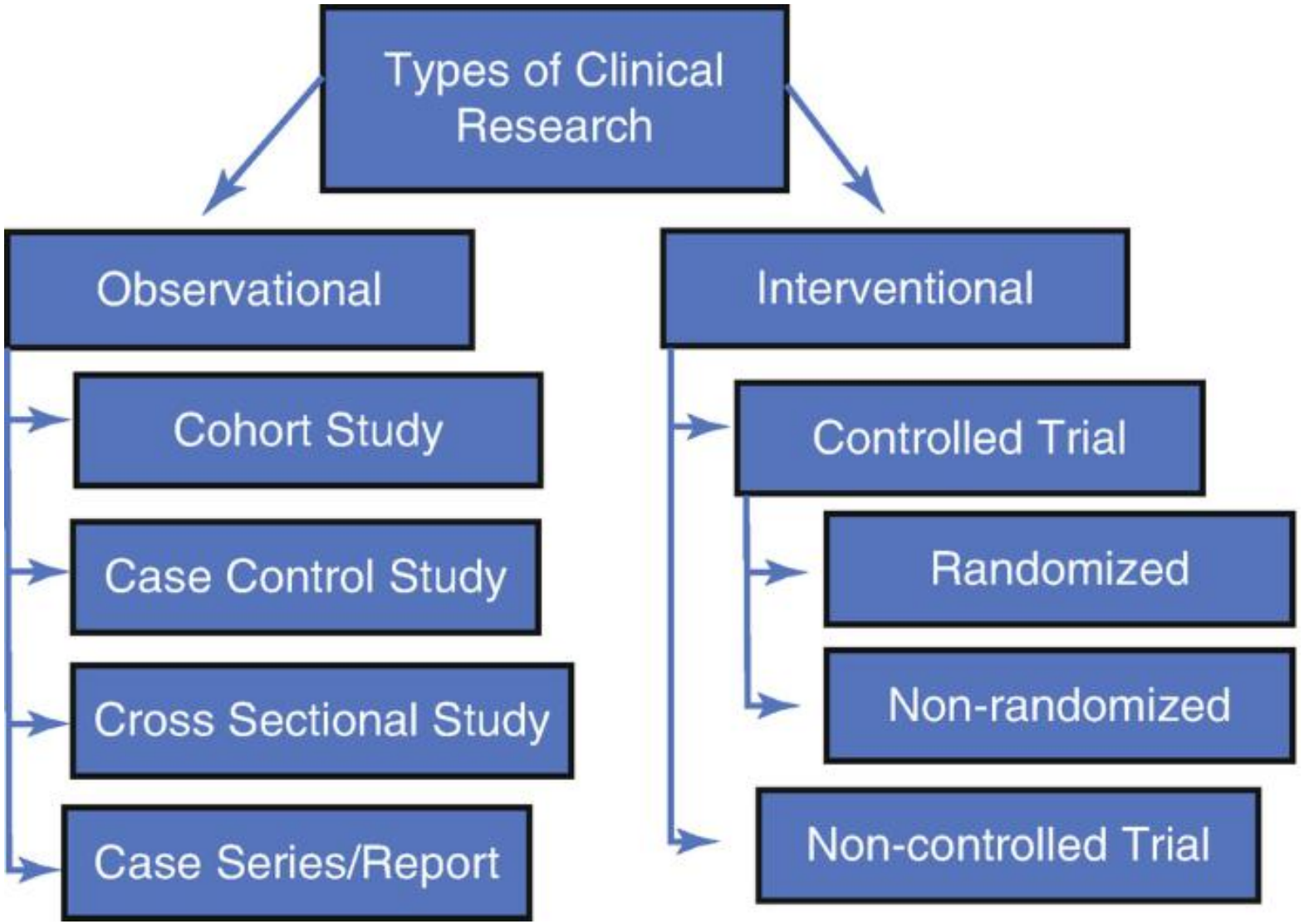
- Involve introducing an intervention to test its effects.
- **Randomized Controlled Trials (RCTs):** Participants are randomly assigned to receive different treatments or a placebo, allowing for a comparison of interventions.
- **Phase I, II, and III Trials:** Specific phases of clinical trials designed to evaluate safety, dosage, and efficacy of new treatments in progressively larger groups of participants.

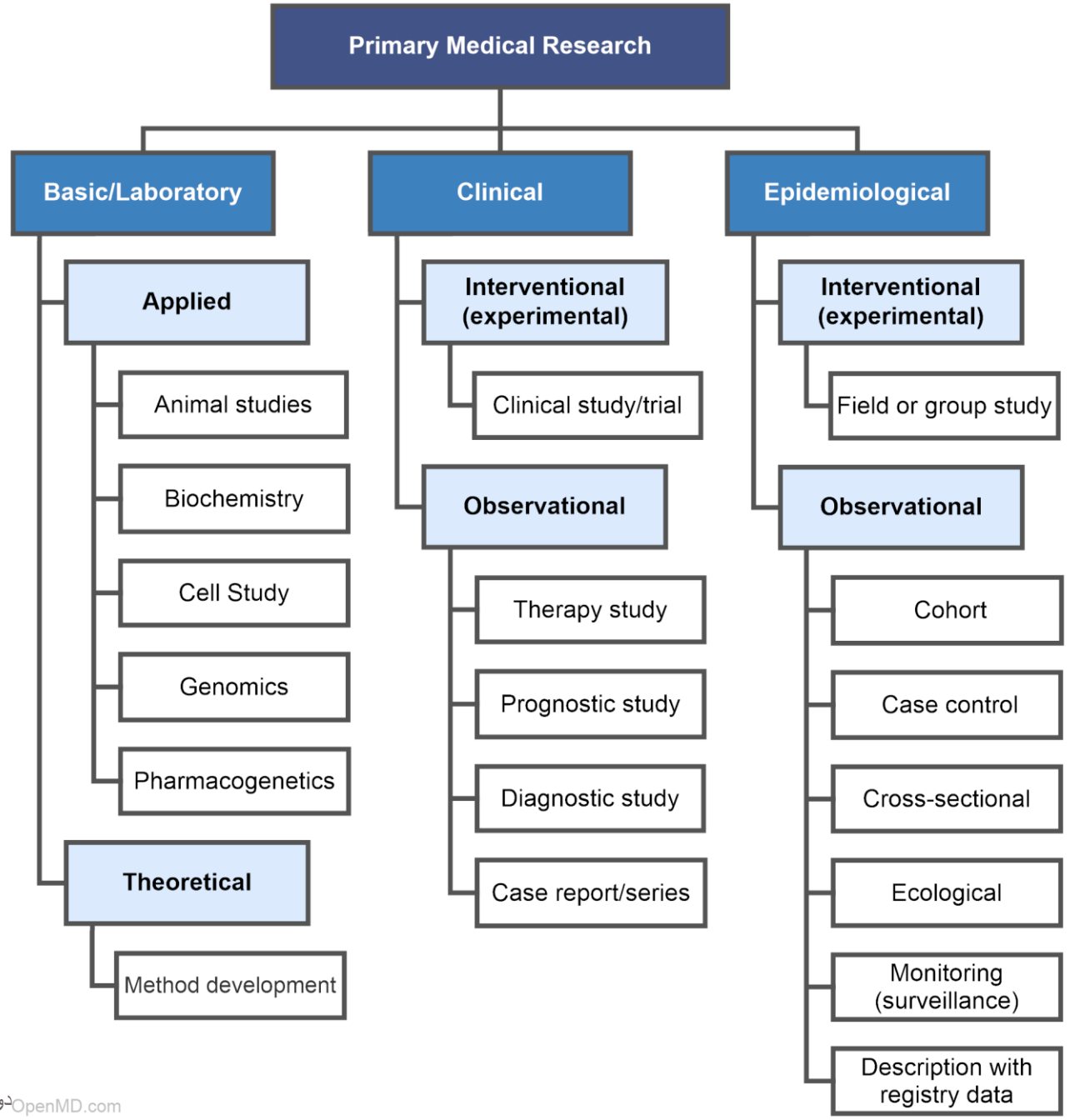
❑ Other Types of Studies:

- **Diagnostic Studies:** Evaluate the accuracy of diagnostic tests.
- **Prognostic Studies:** Track patients to observe disease progression and treatment response.
- **Quality of Life Studies:** Measure the impact of diseases and treatments on patients' well-being.
- **Genetic and Genomic Studies:** Investigate the role of genes and genomes in health and disease.


Types of research
From the viewpoint of
Application
Objectives
Enquiry mode
Pure research
Descriptive research
Exploratory research
Quantitative research
Applied research
Correlational research
Explanatory research
Qualitative research


Primary Research
Secondary Research
Basic Research
Clinical Research
Epidemiological Research
Meta-Analysis
Review
Theoretical
Applied
Experimental
Observational
Experimental
Observational
Systematic
Method Development
Animal Study
Clinical Study
Therapy Study
Intervention Study
Cohort Study
Simple Narrative
Analytical Measurement Procedure
Cell Study
Phase I Study
Prognostic Study
Field Study
Prosepective
Imaging Procedure
Genetic Engineering
Phase II Study
Diagnostic Study
Group Study
Historical
Biometric Procedure
Biochemistry
Phase III Study
Observational Study w/ Drugs
Case Control Study
Monitoring, Surveillance
Test Dev. Assessment Procedure
Material Development
Phase IV Study
Secondary Data Analysis
Cross-Sectional Study
Description with registry data
Genetic Studies
Case Series/Single Case Report
Ecological Study


Types of Clinical Research
Observational
Cohort Study
Case Control Study
Cross Sectional Study
Case Series/Report
Interventional
Controlled Trial
Randomized
Non-randomized
Non-controlled Trial


Primary Medical Research
Basic/Laboratory
Clinical
Epidemiological
Applied
Animal studies
Biochemistry
Cell Study
Genomics
Pharmacogenetics
Theoretical
Method development
Interventional (experimental)
Clinical study/trial
Observational
Therapy study
Prognostic study
Diagnostic study
Case report/series
Interventional (experimental)
Field or group study
Observational
Cohort
Case control
Cross-sectional
Ecological
Monitoring (surveillance)
Description with registry data

Types of Research Methodology

General Category
- Quantitative Research
- Qualitative Research

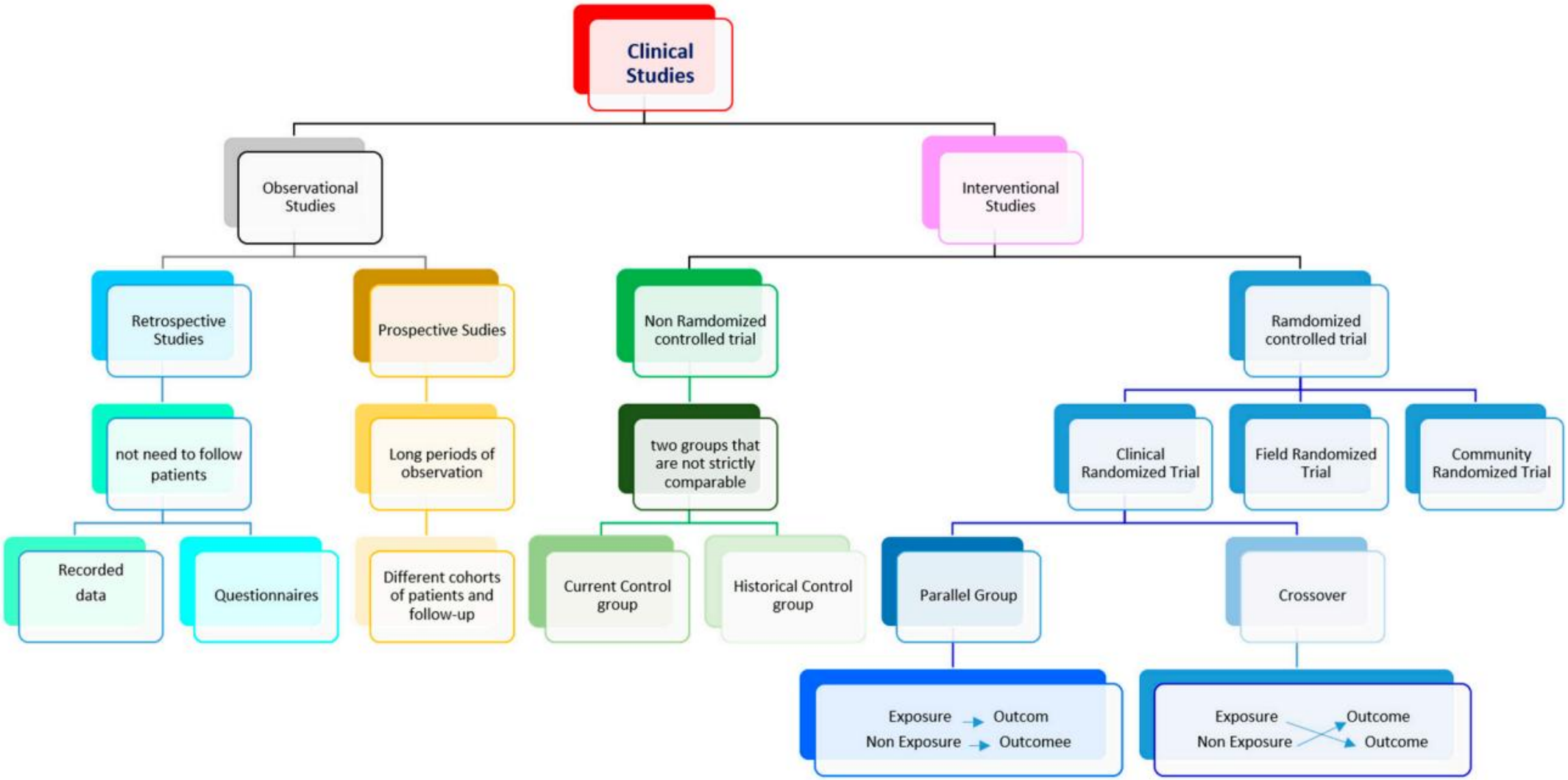
Nature of the Study
- Descriptive Research
- Analytical Research

Purpose of the Study
- Applied Research
- Fundamental Research

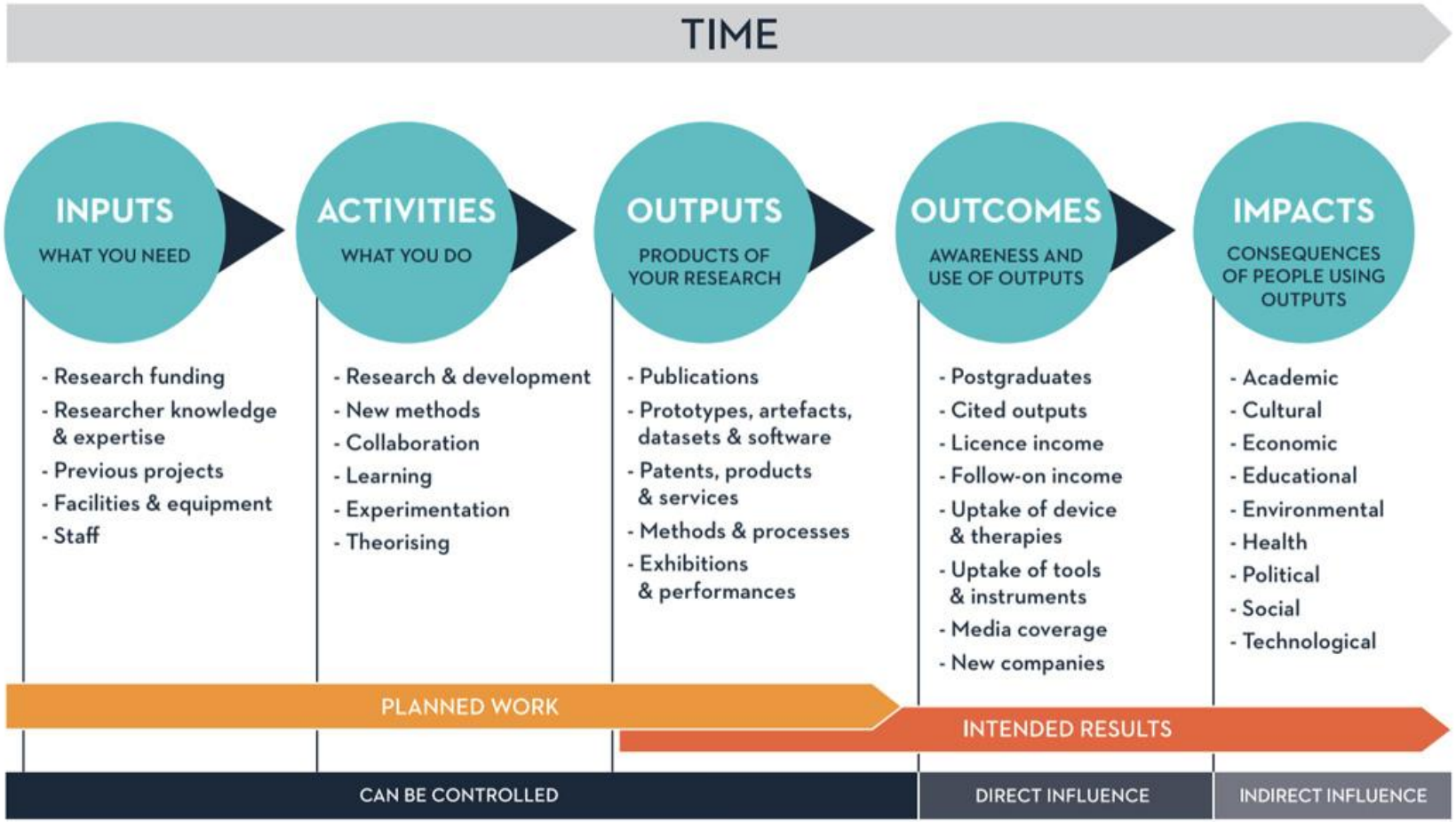
Research Design
- Exploratory Research
- Conclusive Research

Data Type
- Primary Research
- Secondary Research

EDUCBA


Clinical Studies
Observational Studies
Interventional Studies
Retrospective Studies
Prospective Sudies
Non Ramdomized controlled trial
Ramdomized controlled trial
not need to follow patients
Long periods of observation
two groups that are not strictly comparable
Clinical Randomized Trial
Field Randomized Trial
Community Randomized Trial
Recorded data
Questionnaires
Different cohorts of patients and follow-up
Current Control group
Historical Control group
Parallel Group
Crossover
Exposure
Outcom
Non Exposure
Outcomee
Exposure
Outcome
Non Exposure
Outcome

1. ACADEMIC OUTPUTS



Output Type	Description	Audience	Peer-reviewed
Research Article (Journal Paper)	Original findings, typically in peer-reviewed journals	Scholars, scientists	Yes
Review Article	Summary and analysis of existing research	Researchers, academics	Yes
Conference Paper/Abstract	Short presentation of findings at a scientific meeting	Academic community	Varies
Thesis/Dissertation	In-depth report of research for academic degree	Universities, examiners	No (but evaluated)
Book/Monograph	Full-length, in-depth analysis of a topic	Academics, students	Varies

2. APPLIED/PROFESSIONAL OUTPUTS

Output Type	Description	Audience	Peer-reviewed
Technical Report	Detailed methods, data, and results, often for funding agencies or industry	Funders, policymakers	No
Patent	Legal protection of a novel invention	Industry, inventors	No
Policy Brief	Concise summary of research with recommendations	Policymakers, NGOs	No
Standard Operating Procedure (SOP)	Step-by-step protocols developed from research	Laboratories, industry	No
Clinical Guideline	Evidence-based recommendation for healthcare practice	Medical practitioners	Yes (usually)

European Union Programme for Employment and Social Innovation (EaSI) 2014 - 2020[1]

FINAL TECHNICAL REPORT TEMPLATE

1) Title of the action:	
2) Reference number (grant agreement/contract):	

3) Main objectives:
4) Policy themes:

5) Summary of the implementation of the activities[2]**:**	
Planned	**Implemented**
Changes	

6) Were th following target groups involved ?(more than one group possible):	**Yes/No**
(a) national, regional and local authorities	
(b) employment services	
(c) specialist bodies provided for under Union law	
(d) the social partners	
(e) non-governmental organisations	
(f) higher education institutions and research institutes	
(g) experts in evaluation and in impact assessment	
(h) national statistical offices	

[1] REGULATION (EU) No 1296/2013
[2] To be introduced for each key activity

How is Covid-19 affecting gender inequality in low-income countries?

Madison Levine, Niccolo Meriggi, Ahmed Mushfiq Mobarak, Vasudha Ramakrishna, and Maarten Voors

Gender disparities in social and economic outcomes, already larger in the developing world than in the rich countries, have been exacerbated by the pandemic. Policy action is vital to address the compounding of existing inequalities and to protect the most vulnerable women.

Covid-19 has exacerbated the existing inequalities between men and women in terms of economic, health and educational outcomes. Examples of the disproportionately negative effects of the crisis on women are seen around the world (Alon et al, 2020; Adams-Prassl et al, 2020). But women in low- and middle-income countries have faced specific, additional challenges.

For example, in Sierra Leone, families where the male head of household is absent due to divorce, death or long-distance migration were more vulnerable even before the pandemic. Early on in the crisis, households headed by women were less likely to be well informed about the disease, as a result of weaker access to sources of information and social networks. During the crisis, they have elevated rates of food insecurity compared with male-headed households, with the gender differences even starker among the poorest families.

Policies in response to the pandemic need to take account of such gender disparities both to prevent the compounding of existing inequalities and to protect the women who are most vulnerable.

What has been the experience of women in low- and middle-income countries?

Globally, 40% of employed women work in services and labor-intensive segments of manufacturing, such as garment production. These sectors have been among the most adversely affected by the pandemic.

Women also constitute a majority of healthcare, social and domestic workers, jobs characterized by limited protections, but also greater risk of infection (International Labour Organization, ILO, 2020). They are also more likely than men to reduce their paid working hours or leave their jobs due to the increasing burdens of unpaid work — caring for children and the elderly.

Such gender disparities are likely to be exacerbated in low and middle-income countries, where gender gaps in social and economic outcomes are greater (Jayachandran, 2015). In these countries, the gendered nature of work is typically accompanied by less progressive attitudes towards women working in the labor force (Jayachandran, 2015). In addition, a large share of women in developing countries are self-employed, and they may have to divert family money and resources away from their own micro-enterprises during times of crisis.

Many women in low and middle-income countries perform most of the household chores and provide care for children. In South Asia, the Middle East and North Africa, the share of women in unpaid work is as high as 80-90% (McKinsey, 2020). School closures and mobility restrictions during the pandemic have further increased the burden of domestic work and constrained the hours available for compensated work.

There are limited data available on how the Covid-19 crisis is specifically affecting women. A UN Women Report expects the pandemic to deepen gender poverty gaps, especially in already-impoverished regions such as sub-Saharan Africa and South Asia. To make up for the lack of data on vulnerable populations in low- and middle-income countries, researchers are using phone surveys to collect data over time for representative samples (see examples from Bangladesh, Nepal, Kenya and Sierra Leone).

In addition to experiencing economic consequences, women are at increased health risks. The pandemic restricts women's access to maternal healthcare, as resources are reallocated to Covid-19 patients. This was also the case during the Ebola outbreak of 2014–16, when the increased burden

STANDARD OPERATING PROCEDURE

QUANTIMETRIX PERSONNEL HIRING AND TRAINING

Supersedes Document/Revision No.:	SOP-02-001/Rev.007	Revision Date:	04/05/05

The following departments require training:
MFG, QC, Int. Sale, HR, PURCH, EPH, R&D, MKTG, ACCT and QA/RA

1. PURPOSE

1.1. To provide a procedure to define the general guidelines to ensure the hiring and training of Quantimetrix Corporation personnel.

2. SCOPE

2.1. This procedure applies to all Quantimetrix Corporation personnel. Individuals will be hired, trained and instructed on procedures, techniques and equipment as his/her specific job requires. This procedure outlines the minimum requirements.

3. RESPONSIBILITIES

3.1. It is the responsibility of all Quantimetrix supervisors, managers, training coordinators and employees from each department to follow the procedures and guidelines outlined in this Standard Operating Procedure.(SOP-02-001)

4. BACKGROUND, DEFINITIONS & ABBREVIATIONS

4.1. **Background**

4.1.1. §820.20 Management Responsibility
Responsibility and authority. Each manager shall establish the appropriate responsibility, authority and interrelation of all personnel who they supervise, perform and assess work affecting product(s) and provide the independence and authority necessary to perform these tasks.

4.1.2. §820.25 Personnel
General. Each department shall have sufficient personnel with the necessary education, background, training, and experience to assure that all activities required by this department are correctly performed.

4.1.3. Training. Each department shall establish procedures for identifying training needs and ensure that all personnel are trained to adequately perform their assigned responsibilities. Training shall be documented.

4.1.4. As part of their training, personnel shall be made aware of the implications and consequences which may occur from the improper performance of their specific jobs.

3. PUBLIC COMMUNICATION OUTPUTS

Output Type	Description	Audience	Peer-reviewed
Infographic / Poster	Visual summary of data or findings	Public, conferences	No
Press Release	Simplified summary for media use	Journalists, public	No
Science Blog / Podcast	Informal explanation of research	General public	No
Social Media Posts	Short updates or insights based on research	Broad public	No

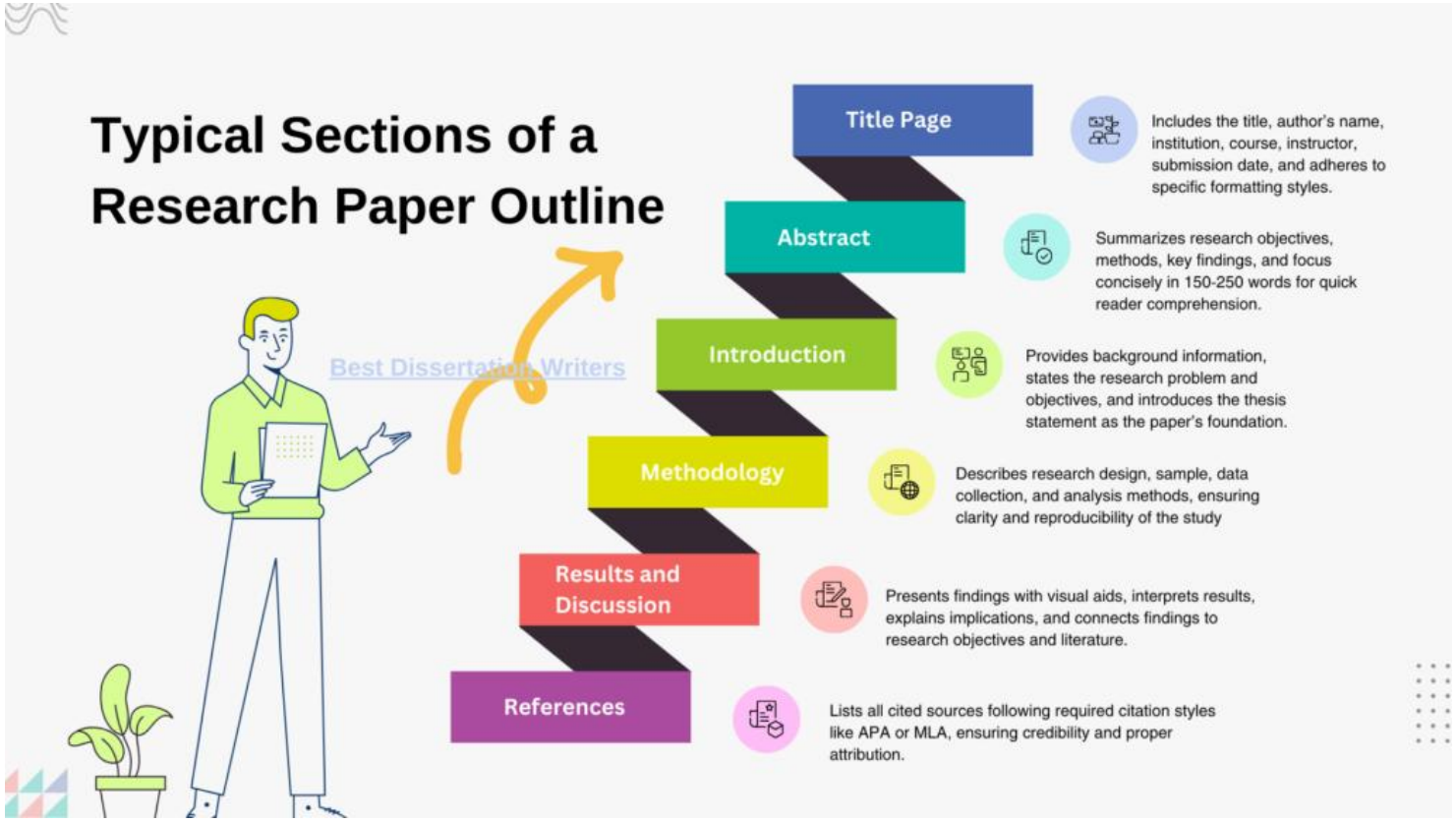
4. DATA & SOFTWARE OUTPUTS

Output Type	Description	Audience	Peer-reviewed
Dataset / Database	Raw or processed research data in shareable formats	Researchers, data analysts	Yes (if published)
Software / Code Repository	Scripts, models, or tools developed in the research process	Developers, researchers	/ Varies
Preprint	**Early version of research shared before peer review**	**Academic community**	**No (yet public)**

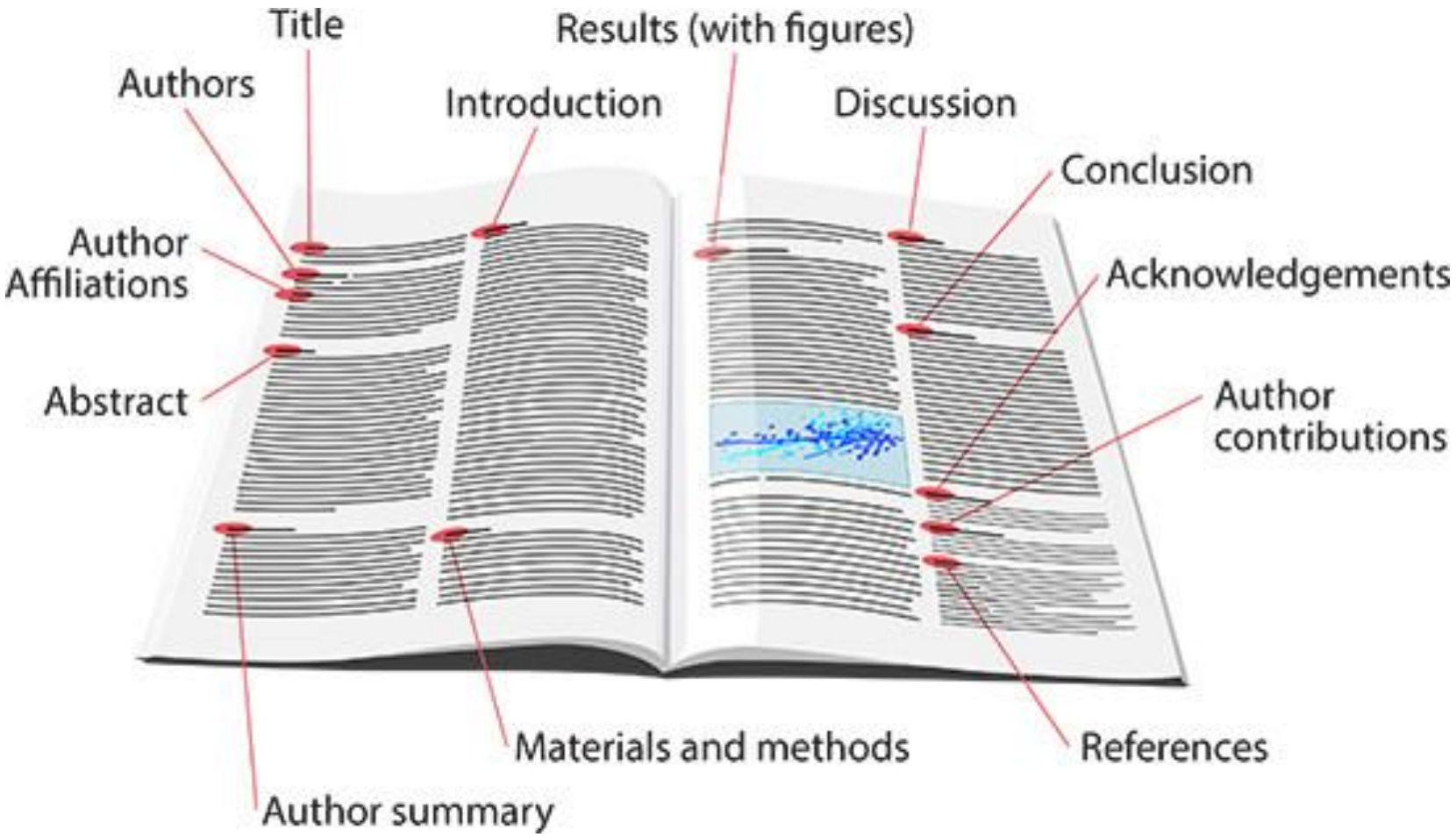
SUMMARY TABLE: RESEARCH OUTPUT BY FUNCTION

Purpose	Common Outputs
Share scientific knowledge	Journal article, review, preprint, thesis
Translate to practice	SOP, clinical guideline, technical report, patent
Support policy or advocacy	Policy brief, white paper, working paper
Engage public or media	Blog, infographic, press release, podcast
Support future research	Dataset, code, open-access software, research protocol

WHAT IS A SCIENCE ARTICLE?



- A **scientific article** presents research findings written by researchers and scientists.
- They are generally considered primary sources and are written for other researchers.
- The most recent articles will contain the most recent work in the field, with references to previously published works in the field of study.
- The most important reason to publish a research article is to add your results to the permanent domain of scientific knowledge—the scientific record. Unlike a slide presentation or poster presentation, the work published in a research article is enduring and immutable. Your published work is always available for anyone to access—now, 20 years from now, perhaps even hundreds of years from now.
- Research articles represent the ultimate, final product of a scientific study.
- A published paper shows that you have completed a research project, from beginning to end, and the peer-reviewed results are indefinitely available for anyone in the world to access.


Title
Authors
Introduction
Results (with figures)
Discussion
Conclusion
Author
Affiliations
Acknowledgements
Abstract
Author
contributions
Materials and methods
References
Author summary

•**Primary articles** (original research articles, case reports/case series, and technical notes)

•**Secondary articles** (narrative review articles and systematic reviews)

•**Special articles** (letters to the editor, correspondences, short communications, editorials, commentaries, and pictorial essays)

•**Tertiary and grey literature.**

Book review

- Many academic journals publish book reviews, which aim to provide insight and opinion on recently published scholarly books.
- Writing book reviews is often a good way to begin academic writing. It can help you get your name known in your field and give you valuable experience of publishing before you write a full-length article.
- If you’re keen to write a book review, a good place to start is looking for journals that publish or advertise the books they have available for review.

Book Reviews in 2024

Article Type: Book Review (77)

Year: 2024 (77)

Book Review
19 Dec 2024

Humanity's noise is the natural world's enemy

People have profoundly altered the planet's soundscape. It's time to quieten down so that other species can thrive.

Alix Soliman

Book Review
19 Dec 2024

Are you what you eat? How food shapes self-image

For centuries we've linked what we consume to how we feel about ourselves.

Lizzie Collingham

Book Review
19 Dec 2024

How to beat the biases harming women's mental health

A commanding examination of the factors that play into women's mental ill health should prompt soul searching by readers of all stripes.

Case report

- A medical case report – also sometimes called a clinical case study – is an original short report that provides details of a single patient case.
- Case reports include detailed information on the symptoms, signs, diagnosis, treatment, and follow-up of an individual patient. They remain one of the cornerstones of medical progress and provide many new ideas in medicine.
- Depending on the journal, a case report doesn’t necessarily need to describe an especially novel or unusual case as there is benefit from collecting details of many standard cases.

Wiley
Case Reports in Medicine
Volume 2024, Article ID 4506082, 4 pages
https://doi.org/10.1155/carm/4506082

WILEY

Case Report

Cartilaginous Choristoma of the Oral Cavity: A Rare Presentation in the Nasopharynx

Maryam Al-Ali and Anastasios Hantzakos

Department of Otolaryngology, Head and Neck Surgery, Cleveland Clinic Abu Dhabi, Abu Dhabi, UAE

Correspondence should be addressed to Maryam Al-Ali; m-2503@hotmail.com

Received 31 August 2024; Accepted 28 November 2024

Academic Editor: Viswanatha Borlingegowda

Objective: This case report describes a rare presentation of a cartilaginous choristoma of the oral cavity within the tonsillar fossa, emphasizing the importance of recognizing and differentiating this uncommon entity from more frequently encountered oral lesions.

Methods: A comprehensive clinical and histopathological examination was conducted on a 30-year-old male patient who presented with a painless mass in the nasopharynx. An excisional biopsy was carried out, and a histopathological analysis was conducted to establish a definitive diagnosis.

Results: Histopathological examination demonstrated a cartilaginous choristoma, characterized by the presence of mature hyaline cartilage surrounded by the connective tissue. The patient underwent surgical excision of the lesion, and follow-up assessments indicated a favorable postoperative outcome without recurrence.

Conclusion: Cartilaginous choristomas in the oral cavity are exceedingly rare. Awareness of this entity is crucial for accurate diagnosis and appropriate management, as it can mimic other more common oral lesions. This case report contributes to the limited literature on oral cartilaginous choristomas and underscores the significance of considering this entity in the differential diagnosis of oral mucosal masses.

Keywords: cartilaginous choristoma; nasopharynx; oral cavity; tonsil; tumor

Clinical study

- In medicine, a clinical study report is a type of article that provides in-depth detail on the methods and results of a clinical trial. They're typically similar in length and format to original research articles.
- Most journals now require that you register protocols for clinical trials you're involved with in a publicly accessible registry. A list of eligible registries can be found on the **WHO International Clinical Trials Registry Platform (ICTRP)**. Trials can also be registered at **clinicaltrials.gov** or the **EU Clinical Trials Register**. Once registered, your trial will be assigned a clinical trial number (CTN).
- Before you submit a clinical study, you'll need to include clinical trial numbers and registration dates in the manuscript, usually in the abstract and methods sections.

European Society for Paediatric Research
Society for Pediatric Research
www.nature.com/pr

CLINICAL RESEARCH ARTICLE OPEN

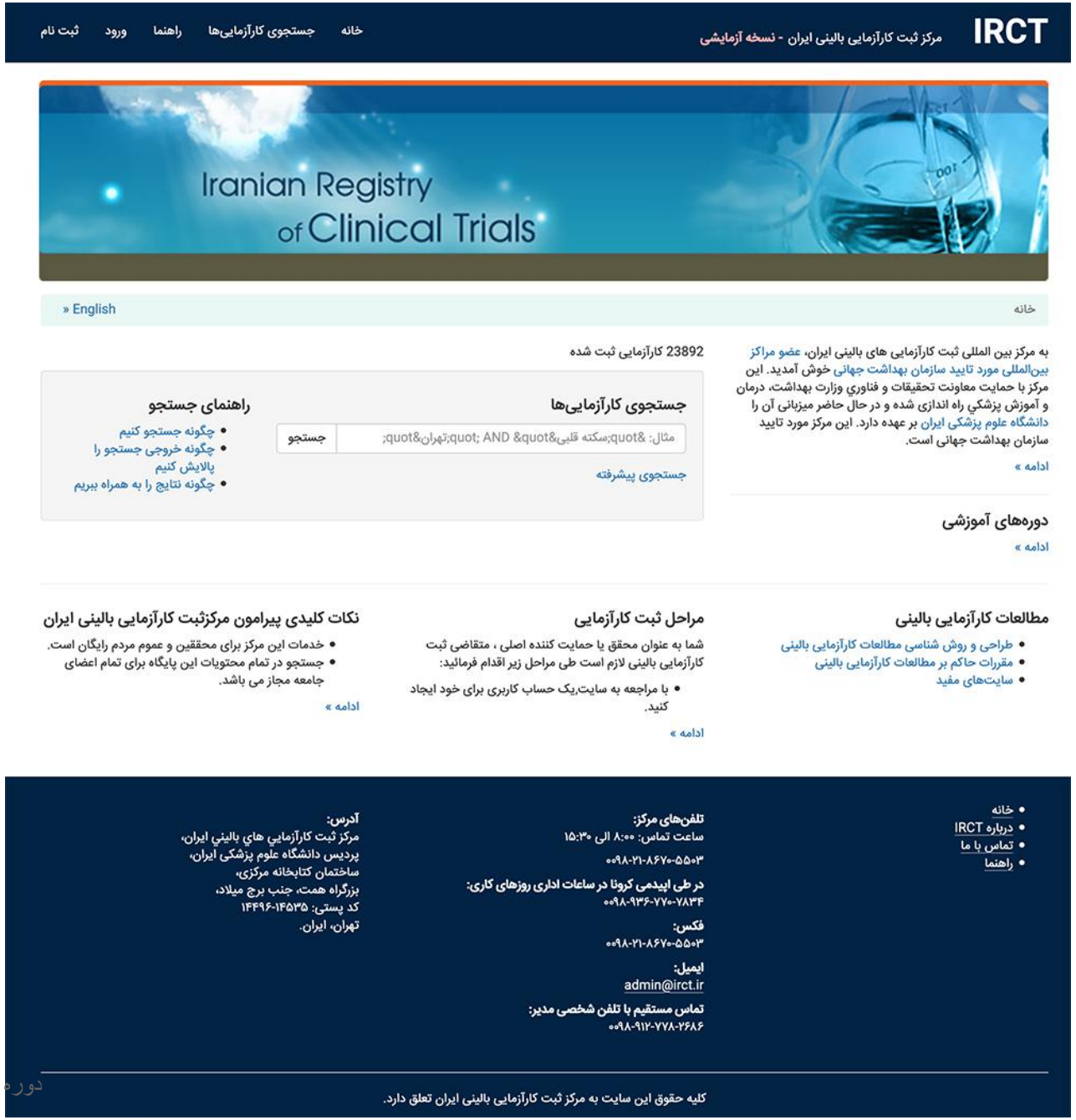
Check for updates

Platelet characteristics in extremely preterm infants after fatty acid supplementation: a randomized controlled trial

Pia Lundgren[1,2]✉, Aldina Pivodic[1,2], Anders K. Nilsson[1], Gunnel Hellgren[1,3], Hanna Danielsson[4,5], Dirk Wackernagel[6,7], Ingrid Hansen Pupp[8], David Ley[8], Karin Sävman[9,10], Mattias Uhlén[11,12], Lois E. H. Smith[13] and Ann Hellström[1,2]

BACKGROUND: Two risk factors for severe retinopathy of prematurity (ROP) in extremely preterm infants are thrombocytopenia and low levels of arachidonic acid (AA) and docosahexaenoic acid (DHA). To date, these risk factors have not been linked.
METHOD: Infants born < 28 weeks gestational age (GA) from 2016 to 2019 were randomized to postnatal enteral AA/DHA supplementation or standard care (controls). Levels of AA and DHA, platelet counts ($< 100 \times 10^9$/L defined as thrombocytopenia) and platelet-related proteins in the infants' first four weeks of life were evaluated for their association with severe ROP.
RESULTS: The mean birthweight of 178 included infants was 806 ± 200 grams, and the mean GA was 25.6 ± 1.4 weeks. During the first four postnatal weeks, 20.2% of AA/DHA-supplemented infants had thrombocytopenia versus 27.7% of controls ($p = 0.29$). In infants with thrombocytopenia, fewer AA/DHA-supplemented infants developed severe ROP than non-supplemented controls, 29.4% (5/17) versus 65.4% (17/26) ($p = 0.031$). Thrombocytopenia and serum levels of AA and DHA correlated with several platelet-related proteins involved in angiogenesis and ROP, such as platelet-derived growth factor subunits A and B and vascular endothelial growth factor.
CONCLUSIONS: AA and DHA supplementation is associated with less severe ROP in thrombocytopenic infants, possibly by modulating platelet activation and function.

Pediatric Research, https://doi.org/10.1038/s41390-024-03775-3


IRCT
مرکز ثبت کارآزمایی بالینی ایران - نسخه آزمایشی
خانه
جستجوی کارآزمایی‌ها
راهنما
ورود
ثبت نام
Iranian Registry of Clinical Trials
خانه
» English
به مرکز بین المللی ثبت کارآزمایی های بالینی ایران، عضو مراکز بین‌المللی مورد تایید سازمان بهداشت جهانی خوش آمدید. این مرکز با حمایت معاونت تحقیقات و فناوري وزارت بهداشت، درمان و آموزش پزشكي راه اندازی شده و در حال حاضر میزبانی آن را دانشگاه علوم پزشکی ایران بر عهده دارد. این مرکز مورد تایید سازمان بهداشت جهانی است.
ادامه »
23892 کارآزمایی ثبت شده
جستجوی کارآزمایی‌ها
مثال: "سکته قلبی" AND "تهران"
جستجو
جستجوی پیشرفته
راهنمای جستجو
چگونه جستجو کنیم
چگونه خروجی جستجو را پالایش کنیم
چگونه نتایج را به همراه ببریم
دوره‌های آموزشی
ادامه »
مطالعات کارآزمایی بالینی
طراحی و روش شناسی مطالعات کارآزمایی بالینی
مقررات حاکم بر مطالعات کارآزمایی بالینی
سایت‌های مفید
مراحل ثبت کارآزمایی
شما به عنوان محقق یا حمایت کننده اصلی ، متقاضی ثبت کارآزمایی بالینی لازم است طی مراحل زیر اقدام فرمائید:
با مراجعه به سایت،یک حساب کاربری برای خود ایجاد کنید.
ادامه »
نکات کلیدی پیرامون مرکزثبت کارآزمایی بالینی ایران
خدمات این مرکز برای محققین و عموم مردم رایگان است.
جستجو در تمام محتویات این پایگاه برای تمام اعضای جامعه مجاز می باشد.
ادامه »
خانه
درباره IRCT
تماس با ما
راهنما
تلفن‌های مرکز:
ساعت تماس: ۸:۰۰ الی ۱۵:۳۰
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LETTER TO THE EDITOR OPEN

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Heat acclimation in mice requires preoptic BDNF neurons and postsynaptic potentiation

Cell Research (2025) 35:224–227; https://doi.org/10.1038/s41422-024-01064-6

Dear Editor,

Heat acclimation (HA) is a key adaptive response in mammals to repeated heat exposure, essential for fitness and survival.[1,2] HA improves cardiovascular function, thermal comfort, and exercise capacity.[3,4] However, the lack of a genetically tractable model has hindered understanding of the molecular and neural mechanisms underlying HA. Here, we show that 10 days of daily 38 °C exposure lowers core body temperature (T_{core}) and reduces anxiety during subsequent heat exposures in mice. HA increases brain-derived neurotrophic factor (BDNF) expression in the medial preoptic area (MPO). BDNF-expressing MPO (MPO^{BDNF}) neurons show increased intrinsic heat sensitivity after HA. These neurons orchestrate downstream targets in the dorsomedial hypothalamus (DMH) and rostral raphe pallidus (rRPa) to mediate HA effects. BDNF, acting through its receptor tropomyosin-related kinase B (TrkB) in the DMH, facilitates the anxiolytic effect of HA by enhancing excitatory synaptic connections between MPO^{BDNF} and DMH neurons. This study provides new insights into HA mechanisms, setting the stage for future research on heat stress reduction and exercise optimization.

Without HA, heat exposure (38 °C) increased anxiety but did not impair novel object recognition in male C57 mice, as assessed in the open field test (OFT) and Y-maze test (Supplementary information, Fig. S1a, b). To establish an effective HA protocol, we evaluated three different protocols. Neither daily exposures to 35 °C for 3 h over 14 days nor daily exposures to 35–38 °C for 3 h over 20 days impacted T_{core} during subsequent 38 °C exposures (Supplementary information, Fig. S1c, d). However, consecutive 10-day exposures to 38 °C for 2 h significantly improved heat tolerance, as marked by a moderate rise in T_{core} during subsequent 38 °C exposures (Supplementary information, Fig. S1e). Thus, we established an effective HA protocol. Under this protocol, food intake decreased while water intake significantly increased during the 2-h heat exposure. Over the full 10-day acclimation period, water consumption increased significantly, while no changes were observed in body weight or food intake (Supplementary information, Fig. S1f–l).

After HA, we re-exposed the mice to 38–40 °C to systematically assess the adaptive effects (Fig. 1a). HA mice displayed extended T_{core} tolerance in the heat tolerance test (HTT) at 40 °C, which lasted three times longer than that in the non-HA group, as measured by the latency for T_{core} to reach 41.5 °C (a critical thermal limit[5]) (Fig. 1b). In addition, HA mice exhibited increased open arm exploration in the elevated plus maze (EPM) (Fig. 1c) and central exploration during OFT (Supplementary information, Fig. S2a, b), indicative of reduced anxiety. However, HA did not influence thermal preference or nociceptive heat perception (Supplementary information, Fig. S2c, d). While physical activity remained constant during heat exposure at 38 °C, energy expenditure (EE) reduced (Supplementary information, Fig. S2e, f). This reduction in EE aligned with decreased mRNA levels of uncoupling protein 1 (UCP1) in brown adipose tissue (Supplementary information, Fig. S2g). HA did not affect the time spent or the number of entries into the closed arms in the Y-maze (Supplementary information, Fig. S2h). HA also enhanced thermoregulatory behaviors, as characterized by longer grooming time (Supplementary information, Fig. S2i) and faster, longer body postural extension during heat exposures (Supplementary information, Fig. S2j). Similarly, HA training in female mice also enhanced T_{core} tolerance and reduced heat-induced anxiety (Supplementary information, Fig. S3a–c). Thus, HA significantly improves heat tolerance and alleviates anxiety by reducing thermogenesis and bolstering thermoregulatory capacity, without affecting cognitive and pain perception functions.

Building on previous findings that BDNF neurons in the preoptic area (POA) are crucial for heat defense and that acute heat exposure significantly increases POA BDNF expression,[6,7] we hypothesized that BDNF plays a role in HA. In line with this, HA mice showed elevated *Bdnf* mRNA expression after subsequent 38 °C exposure (Fig. 1d). Considering the importance of intrinsic thermosensitivity in heat defense[8,9] and its proposed role in HA,[10,11] we first recorded the basal firing rates at 36 °C and found that HA notably increased the firing rates of MPO^{BDNF} neurons. We further found that the thermosensitivity of MPO^{BDNF} neurons increased significantly after HA, resulting in a rise in the proportion of warm-sensitive neurons (WSNs, defined as neurons with thermosensitivity > 0.8 imp/s/°C). The proportion increased from 22.7% to 43.3% (Fig. 1e), exceeding the overall increase in MPO neurons (from 27.3% to 36.7%; Supplementary information, Fig. S4a). Taken together, these results highlight that HA increases MPO BDNF expression, and intrinsic thermosensitivity of MPO^{BDNF} neurons.

To determine the roles of MPO^{BDNF} neurons in HA, we inhibited them using tetanus neurotoxin (TeNT) (Fig. 1f). Consistent with their reported role in heat defense,[7] this inhibition impaired basal heat defense function, leading to a rise in T_{core} at 38 °C during the first day of HA training (Supplementary information, Fig. S4b, c). Notably, this inhibition nearly abolished the HA effect on T_{core} tolerance, with T_{core} rapidly increasing to 41.5 °C during the HTT (Fig. 1g). Concurrently, the anxiety-reducing effect of HA was also negated (Fig. 1h; Supplementary information, Fig. S4d). Thus, MPO^{BDNF} neurons are required for the HA effects on T_{core} and anxiety.

To ascertain whether MPO^{BDNF} neural activation could induce an HA effect without HA training, we employed optogenetic activation using ChR2 (Fig. 1i). Intriguingly, optostimulation at 1 Hz over three consecutive days elicited a pronounced HA effect, as evidenced by a 2-fold increase in the time taken to reach 41.5 °C in the HTT compared with GFP controls (Fig. 1j). To identify downstream targets of MPO^{BDNF} neurons, we considered the

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BMC Research Notes

DATA NOTE Open Access

SNP profiling of *Elaeis oleifera* (H.B.K) Cortes germplasm in Ucayali, Peru using Genotyping-by-Sequencing (GBS)

Alina Camacho-Villalobos[1*], Orson Mestanza[2], Rosa M. Cabrera-Pintado[3], Glendy Sanchez Sunción[4] and Jorge Bendezu[5]

Abstract

Objectives *Elaeis oleifera*, commonly known as the American oil palm, plays a crucial role in the agricultural economies of Central and South America due to its unique oil characteristics and resistance to certain diseases. Despite its importance, limited available genetic information has hindered the effective utilization of this species in breeding programs aimed at improving oil yield and disease resistance. This study employed Genotyping-by-Sequencing (GBS) to profile polymorphisms within *Elaeis oleifera* populations, the unique germplasm bank for Peru, located in Ucayali, Peru, aiming to characterize the gene pool.

Data description The GBS analysis successfully identified 22,703 informative single-nucleotide polymorphisms (SNPs) across the twelve-year-old plant genomes ($n=42$). Observed heterozygosity (Ho = 0.3086) and expected heterozygosity index (He = 0.3385) were quantified. The fixation index (Fst = 0.0048) indicated low genetic differentiation within the germplasm. However, the presence of two genetic clusters (C_1 and C_2) distributed homogenously within the studied population has been detected; the origin of these clusters could be mainly associated with the initial management of the germplasm nucleus within Peru. The extensive SNP dataset provides a comprehensive genetic map that is invaluable for the conservation and enhancement of *Elaeis oleifera* in our region.

Keywords *Elaeis oleifera*, American oil palm, SNP, Germplasm, Cluster, Genetic diversity

RESEARCH NOTE Open Access

Evaluating the accuracy of HIV-1 viral load testing using near point of care Xpert HIV-1 system at Solwezi general hospital, Zambia

Keembe Siakantu[1†], David Chisompola[2*] and Aaron Tembo Konzani[3†]

Abstract

Objective HIV-1 Viral Load Testing plays a crucial role in the management of HIV/AIDS patients by quantifying the presence of HIV-1 RNA in the blood, which directly relates to viral replication and disease progression. Monitoring viral load enables healthcare professionals to evaluate the effectiveness of Anti-Retroviral Therapy, adapt treatment strategies, and assess the overall health status of individuals with HIV. This was a cross-sectional study to evaluate analytical performance (accuracy, precision and linearity) of the near point of care Xpert HIV-1 viral load.

Results The analytical performance of the GeneXpert assay to the conventional Hologic Panther system was strong. Specifically, the GeneXpert demonstrated a sensitivity, specificity, and accuracy of 87.6%, 100%, and 98.5%, respectively, when compared to the Hologic Panther. A strong correlation between the two assays was evident ($r = 0.97$, $p < 0.0001$). Additionally, precision, as indicated by the coefficient of variation (CV), for high viral load was 1.38% for GeneXpert while for low viral load, it was 2.59%. In the linearity analysis, all data points remained within acceptable ranges, yielding correlation coefficients ≥ 0.99 for both assays.

Conclusion The Xpert HIV-1 viral load assay demonstrates high efficacy in accurately identifying and quantifying HIV-1 viral loads, making it a valuable tool for HIV diagnosis and monitoring. This reliability makes it particularly suitable for critical populations requiring timely and accurate viral load monitoring.

Keywords Accuracy, Diagnosis, GeneXpert, HIV-1, Hologic panther, Solwezi, Zambia

Introduction

Background

The Human Immunodeficiency Viruses (HIV) has a significant global impact, and it has been estimated that 38 million people worldwide are living with HIV/AIDS in 2020 [1]. In Africa, particularly in Zambia, the burden of HIV remains alarmingly high. As of 2020, approximately 1.2 million people in the country were receiving treatment for HIV, highlighting the ongoing public health challenge and the critical need for sustained intervention efforts [2].

Zambia has been significantly impacted by the HIV-1 epidemic, with approximately 11.0% of the population

†Keembe Siakantu and Aaron Tembo Konzani these authors contributed equally to this work.

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METHODOLOGY

Recovery of mouse growth hormone from *E. coli* inclusion bodies using a mild solubilisation and repeated freeze–thaw approach

Minah Kim[1] · Ries J. Langley[2,3] · Jo K. Perry[1,3] · Yue Wang[1,3]

Received: 16 April 2025 / Accepted: 3 June 2025

Abstract

Background Recombinant mouse GH (mGH) is a critical tool for investigating GH-GH receptor (GHR) interactions in rodent models. However, while numerous methods exist for producing human GH, detailed protocols for the expression and purification of recombinant mGH remain scarce in the literature.

Methods We developed a method for refolding mGH from inclusion bodies produced in *Escherichia coli* (*E. coli*). Recombinant mGH was fused with a N-terminal thioredoxin (Trx) tag and was expressed as inclusion body proteins in *E. coli* when induced at 30 °C. Inclusion bodies were isolated and solubilised under mild conditions (50 mM Tris–HCl, 2 M urea, pH 10.5) and freeze-thawed.

Results Three rounds of freeze-thawing improved solubilisation when compared to a single round. Subsequently, recombinant mGH underwent Trx-tag removal and was purified using anion exchange chromatography to achieve a purity of 98%. Purified mGH displayed circular dichroism spectral profiles comparable to that of commercially sourced mGH, confirming the preservation of the secondary structure in refolded mGH. Bioactivity was confirmed using a Ba/F3-mGhr cell viability assay and showed that refolded mGH had comparable bioactivity to commercially sourced mGH. Bioactivity was also assessed by measuring activation of mGH receptor signal transduction in B16-F10 mouse melanoma cells by phosphorylated STAT5 western blot analysis.

Conclusions We present an efficient and cost-effective protocol for mGH production. This repeated freeze–thaw approach may have broad application for other proteins expressed in the form of inclusion bodies for which low yields are observed following a single round of freeze–thaw.

Keywords Recombinant protein expression · Mouse growth hormone · Inclusion body · Mild solubilisation

Introduction

Growth hormone (GH) is a 22 kDa pituitary-secreted hormone critical for a multitude of physiological processes, including promotion of longitudinal growth, regulating metabolism, and maintaining muscle mass [1]. In addition to actions in normal physiology, its involvement in the pathogenesis of various diseases and conditions, such as cancer, diabetes, and aging, has become increasingly evident [2–4].

Recombinant GH can be produced in *Escherichia coli* (*E. coli)* and eukaryotic expression systems. Production and purification methods for GH from numerous species (including human, bovine, and fish) have been widely reported [4]. However, to date, there is a paucity of published literature detailing large-scale production and purification of recombinant mouse GH (mGH). mGH has been produced utilising fed-batch fermentation methods. However, when expressed in *E. coli*, soluble expression is poor, with most protein in the form of inclusion bodies [5, 6]. Although providing the benefit of enriching for the recombinant protein-of-interest, often at high concentration and purity, inclusion bodies can also hinder efficient recombinant protein production by necessitating additional steps to denature and refold the

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REGISTERED REPORT

The Bangla Big Five Inventory-2: a comprehensive psychometric validation

Mushfiqul Anwar Siraji[2], Fahria Karim[2], Christopher J. Soto[3] & Shamsul Haque[1]✉

The Big Five Inventory-2 (BFI-2) is a widely recognized tool for assessing personality traits across five domains and fifteen facets. However, its psychometric properties in non-Western cultures like Bangladesh remain unexplored. This study aimed to validate the Bangla BFI-2 (BFI-2-B) within a Bangladeshi community sample to provide a culturally adapted personality assessment tool. A cross-sectional survey was conducted on 1,095 participants, where 646 participants (59%; 358 female; Age_{mean} = 24.25 years, SD = 4.47) passed all attention checks. Participants responded to a demographic questionnaire, Bangla Big Five-2 (BFI-2-B), and Bangla NEO Five-Factor Inventory (NEO FFI). The domain-level structural validity was analyzed using Exploratory Structural Equation Modeling (ESEM). A series of five different latent models were tested by Confirmatory Factor Analysis (CFA) for facet-level structural validity. Full Measurement invariance across gender, education level, and language were tested. The item quality was assessed using Item Response Theory analysis (IRT). Convergent and discriminant validity were assessed by correlating the BFI-2-B domains with the NEO-FFI. The BFI-2-B demonstrated high internal consistency across domains (> 0.70) and facets (> 0.60; except *energy level*, *intellectual curiosity*, and *respectfulness*). ESEM confirmed structural validity at the domain level (*CFI* & *TLI* = 0.96). CFA analysis revealed that at the facet level, a three-facet structure with an acquiescence factor yielded the most acceptable fit ($CFI \& TLI \geq 0.95$; $RMSEA \leq 0.06$; $SRMR \leq 0.08$). Full measurement invariance was established across gender and educational levels, but only weak invariance was found across languages, indicating linguistic challenges. The similar domains of BFI-2-B and NEO-FFI had strong correlations ($r \geq 0.59$), and distinct domains exhibited low correlations, indicating strong convergent and discriminant validity. IRT analysis showed that most items had high to moderate discrimination. The BFI-2-B is a reliable and valid tool for assessing personality in the Bangladeshi context, with robust psychometric properties across domains and most facets. Addressing linguistic nuances and testing in more diverse samples can further enhance its cross-cultural applicability.

The stage 1 protocol for this Registered Report was accepted in principle on 24/09/24. The protocol, as accepted by the journal, can be found at: 10.17605/OSF.IO/7DTQG.

Personality traits are relatively enduring patterns of thoughts, emotions, and behaviors guiding an individual's tendency to respond in a certain way under a given circumstance[1]. There is a consensus in the literature that personality traits robustly influence our health and wellness[2], job performance[3], and academic achievement[4]. Hence, it is critically important to measure personality traits precisely. In that vein, a major psychometric theory in the personality field- *Big Five (BF) theory*[5–7] was brought to light, which categorized personality traits into five independent bipolar dimensions: *Extraversion, Neuroticism or Negative Emotionality, Agreeableness, Consciousness,* and *Open mindedness*. In addition to this five-domain model of the BF, literature has extended its support to the hierarchical nature of the BF domains with several facets nested under each domain[8–10]. The main difference between domain and facet is the degree of conceptual breadth they cover. Each personality trait domain of the BF (e.g., *BF-Extraversion*) enjoys a higher bandwidth of conceptual breadth and represents a large amount of behavioral information[7]. In contrast, personality trait facets are narrowly defined (e.g., the "sociable" facet under the "*BF-Extraversion*" domain) and provide a specific description of behaviors.

Rooted in the BF theory, several personality assessment tools were developed, including the NEO Personality Inventory-revised[11], International Personality Item Pool-NEO[8], and Big Five Aspect Scale[12]. These long, in-

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Current Pharmaceutical Design, XXXX, XX, 1-10

RESEARCH ARTICLE

Improving Vaccine Response through Probiotics and Micronutrient Supplementation: Evaluating the Role of TLR5 in Adult Female BALB/c Mice

Zohre Eftekhari[1,*], Delaram Doroud[2], Maryam Tajabadi-Ebrahimi[3] and Fatemeh Kazemi-Lomedasht[4]

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ARTICLE HISTORY

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Abstract: ***Background*:** The role of probiotics and micronutrients in improving immune system function and response to vaccination has been proven. Hence, this study aimed to investigate the effects of probiotics enriched with micronutrients on the immunogenicity of PastoCovac® vaccine.

***Methods*:** The probiotic supplement BioBoost® and PastoCovac® vaccine, which contain six expressed Receptor-binding Domains (RBD) and conjugated with tetanus toxin, were administered concurrently. The safety and efficacy were assessed by determining Immunoglobulin G (IgG) antibody titers to RBD and cytokines, mRNA expression of Toll-like Receptors (TLRs) 5, and clinical symptoms.

***Results*:** Results revealed that the administration of the probiotics enriched with micronutrients and vitamins for 14 days before the first vaccine dose, followed by continued supplementation for 14 days after the first dose, and in conjunction with the second vaccine dose, yielded the most significant elevation in Interleukin 4 (IL-4), Tumor Necrosis Factor-alpha (TNF alpha), Interferon-gamma (IFN-gamma), and anti-SARS-CoV-2 RBD IgG levels within the supernatant samples collected from spleen cultures with the highest expression of TLR5 genes in intestinal samples, compared to the control group.

***Conclusion*:** Our results indicated that the inclusion of probiotics enriched with micronutrients and vitamins significantly enhanced the immunogenicity of the PastoCovac® vaccine. Based on the recommendation to administer third and fourth vaccine doses, particularly for vulnerable and elderly individuals, the utilization of supplements containing probiotics is expected to favorably influence immune responses.

Keywords: Probiotic, micronutrients, immunogenicity, PastoCovac® vaccine, COVID-19, immune system.

1. INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) pandemic emerged as a consequence of the worldwide spread of the coronavirus disease 2019, attributed to the novel coronavirus SARS-CoV-2. The virus had spread to numerous countries and was causing significant infection and death worldwide [1]. The emergence of the infection required immediate vaccination efforts, leading to the exploration of various platforms, such as adenovirus-vectored, nucleic acid-based, recombinant protein-based, and inactivated virus-based vaccines. In 2023, the effects of the COVID-19 pandemic were expected to persist due to the potential emergence of new virus variants, which could cause further disruption [2, 3].

Protein subunit vaccines have a proven track record of safety and effectiveness [4]. The spike protein of SARS-CoV-2 comprises two distinct segments: S1 and S2. The S1 segment encompasses the Receptor-binding Domain (RBD), which is responsible for binding to the host cell receptor angiotensin-converting Enzyme 2 (ACE2). On the other hand, the S2 segment facilitates the fusion of viral and host cell membranes. This alternative vaccine approach hinges on utilizing specific components of the SARS-CoV-2 protein, such as the spike protein's S1 and RBD. This strategy demonstrates notable advantages in terms of safety, immunogenicity, and cost-effectiveness. Several recent studies suggest that RBD-based SARS-CoV-2 vaccines yield promising outcomes in healthy individuals [5-7].

In recent years, there has been much focus on the role of microbiota in shaping immune system development due to their impact on immune cell signaling and differentiation, as they are involved in driving both innate and acquired immunity. Several lines of evidence support the role of factors, including nutritional status and gut microbiota, in the immunogenicity of vaccines [8]. The gut microbiota is a critical determinant of the adaptive immune response to vaccination. It plays a critical role in shaping vaccine efficacy and is influenced by factors such as diet, antibiotic use, and probiotics. Vaccine efficacy could be enhanced using natural adjuvants, such as probiotics targeting the gut microbiota [9, 10].

The microbiome can influence the microbial composition itself and the vaccine responses through various mechanisms so that bacterial Deoxyribonucleic Acid (DNA), Lipopolysaccharide (LPS), proteins, and flagellin can activate the Toll Like Receptor (TLR) pathways and, in turn, drive the Dendritic Cell (DC) responses. In particular, probiotic bacteria can activate TLRs, leading to Nuclear Factor kappa B (NF-κB) in immune cells [11, 12]. Previous studies revealed that consumption of probiotics caused an increase in the

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A quantitative, formal, epidemiological study design used to systematically assess the results of previous research to derive conclusions about that body of research. Typically, but not necessarily, a meta-analysis study is based on randomized, controlled clinical trials.

Molecular Therapy
Nucleic Acids
Review

Advancements and challenges in mRNA and ribonucleoprotein-based therapies: From delivery systems to clinical applications

Zohre Eftekhari,[1,4] Horieh Zohrabi,[1,4] Akbar Oghalaie,[1] Tahereh Ebrahimi,[2] Fatemeh Sadat Shariati,[3] Mahdi Behdani,[1] and Fatemeh Kazemi-Lomedasht[1]

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The use of mRNA and ribonucleoproteins (RNPs) as therapeutic agents is a promising strategy for treating diseases such as cancer and infectious diseases. This review provides recent advancements and challenges in mRNA- and RNP-based therapies, focusing on delivery systems such as lipid nanoparticles (LNPs), which ensure efficient delivery to target cells. Strategies such as microfluidic devices are employed to prepare LNPs loaded with mRNA and RNPs, demonstrating effective genome editing and protein expression *in vitro* and *in vivo*. These applications extend to cancer treatment and infectious disease management, with promising results in genome editing for cancer therapy using LNPs encapsulating Cas9 mRNA and single-guide RNA. In addition, tissue-specific targeting strategies offer potential for improved therapeutic outcomes and reduced off-target effects. Despite progress, challenges such as optimizing delivery efficiency and targeting remain. Future research should enhance delivery efficiency, explore tissue-specific targeting, investigate combination therapies, and advance clinical translation. In conclusion, mRNA- and RNP-based therapies offer a promising avenue for treating various diseases and have the potential to revolutionize medicine, providing new hope for patients worldwide.

INTRODUCTION

Background on mRNA and ribonucleoprotein therapies

In vitro transcription (IVT) of mRNA involves utilizing linearized plasmid DNA or PCR templates, which necessitate a promoter and the corresponding mRNA construct sequence.[1–3] Polymerases such as T7, T3, or SP6 are added to facilitate IVT, but additional capping is necessary to prevent rapid degradation of uncapped mRNA by RNase, which contains a 5′-ppp group causing heightened immune stimulation.[4,5] Capping can be achieved through two methods: co-transcriptional and post-transcriptional capping.[6] Co-transcriptional capping involves incorporating cap dinucleotide mixtures at the 5′ end of RNA during transcription, allowing coordinated transcription with mRNA capping.[7] However, this method encounters challenges such as the competitive incorporation of GTP nucleosides, which can impact capping efficiency. Initially, GTP binds to RNA chains through a 5′-5′ triphosphate bond and undergoes 7-methylation at the 5′ terminal guanosine during post-transcriptional capping.[8] Capping enzymes derived from vaccinia virus are efficient in capping mRNA, producing cap 0, while cap-specific 2′-O methyltransferase can further modify cap 0 to cap 1 or cap 2, reducing mRNA immunogenicity.[9,10] However, capping can lead to the formation of m7GpppGpG in a reversed linkage, hindering mRNA translation. Anti-reverse cap analogs are synthesized to enhance translation efficiency by modifying the m7G part of caps.[11,12] Poly(A) tails in IVT mRNAs can be encoded in the DNA template or added enzymatically, with the former method providing more precise control.[8,13,14] Linearization of plasmid templates using type II restriction enzymes can lead to overhangs at the 3′ end of poly(A) tails, affecting translational efficacy, necessitating the use of type IIS restriction enzymes to avoid this issue.[1,15]

In-vitro-transcribed mRNAs necessitate purification to eliminate immunostimulatory contaminants, free ribonucleotides, as well as short mRNA and DNA templates.[16–19] DNase is typically used to degrade excess DNA templates, followed by commercial purification kits and precipitation methods using ethanol or isopropanol to obtain high-purity mRNA. Chromatographic methods such as molecular exclusion chromatography, ion-exchange chromatography, or affinity chromatography can further purify mRNA, while reversed-phase HPLC is effective in removing dsRNA contaminants but may not be scalable for large-scale production.[18,19] Alternatively, RNase III has been proposed for the removal of dsRNA contaminants, and cellulose chromatography has shown promise in purifying IVT mRNAs efficiently and on a larger scale. Gel electrophoresis can also be employed to remove short RNAs and separate long RNAs. Ultimately, the choice of purification method depends on the specific purity requirements and scale of production, with stringent quality control being essential for maximizing the benefits of mRNA therapeutics.[18]

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CORRECTION

Correction: The correlation of fibrinogen-like protein-1 expression with the progression and prognosis of hepatocellular carcinoma

Nanni Hua[1,2] · Anxian Chen[3] · Chen Yang[4] · Hui Dong[5] · Xianglei He[6] · Guoqing Ru[6] · Xiangmin Tong[2] · Feifei Zhou[7] · Shibing Wang[2]

Correction to: Molecular Biology Reports (2022) 49:7911–7919
https://doi.org/10.1007/s11033-022-07624-6

In this article, Fig. 2D appeared incorrectly and has now been corrected in the original publication. For completeness and transparency, the correct and old incorrect versions are displayed below.

The original article has been corrected.

The original article can be found online at https://doi.org/10.1007/s11033-022-07624-6.

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HOW TO READ AND UNDERSTAND A SCIENTIFIC PAPERS

How to Interpret a Study

Six questions to ask when you are reading a study

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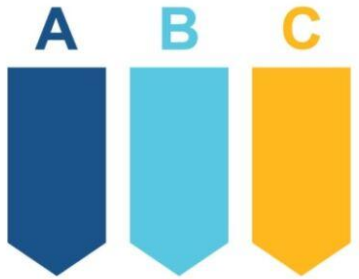
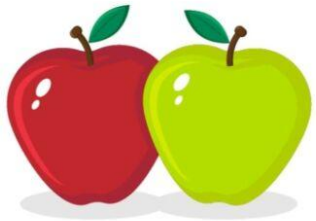
2. When was the study published?



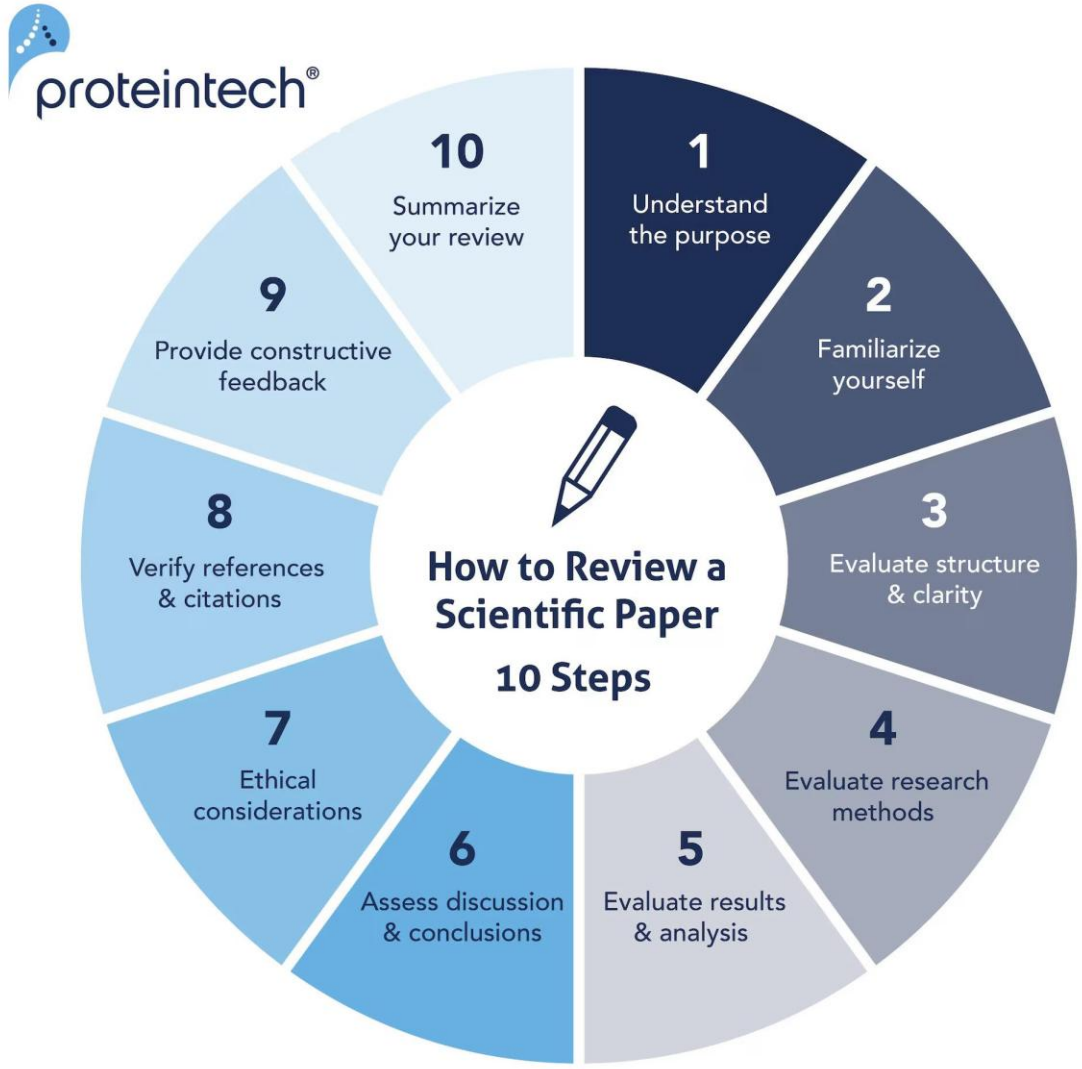
3. What type of study is it?



4. Are you comparing apples to apples?

5. What is the p-value and how was the data collected?

6. What are the limitations of the study?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How to Review a Scientific Paper
10 Steps

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Read the title, abstract, and conclusions:

This provides a concise summary of the paper's purpose, methods, and main findings, giving you the "beginning" and "end" of the story.

Review figures and captions:

Visual elements often convey key information more effectively than text and can help you quickly grasp the high-level story.

Check the publication date:

This helps understand the recency of the research and its place within the broader field.

2. Active Reading & Comprehension:

Read the introduction:

Understand the background information, previous research, and the rationale for the current study.

Focus on the "what" and "why":

As you read, ask yourself what the authors are trying to understand, why they chose their approach, and what the significance of the work is within the field.

Engage with the methods and results:

Understand the experiments conducted and the data generated. Pay attention to the methods' appropriateness and the data's suggestions.

Critical assessment of conclusions:

Evaluate the authors' interpretations of the results and draw your own conclusions, comparing them with the authors'.

Take notes and summarize:

Highlight important information, mark key points, and use your own words to summarize sections or the entire paper to solidify your understanding.

Address challenging vocabulary and concepts:

If you encounter unfamiliar terms or complex ideas, look them up and consult references if necessary.

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Re-reading the paper, perhaps in a different order (e.g., chronological order after an initial skim), can enhance comprehension.

Connect to your research:

If applicable, consider how the paper's findings or methods could inform your own research interests.

AI IN WRITING THE ARTICLE

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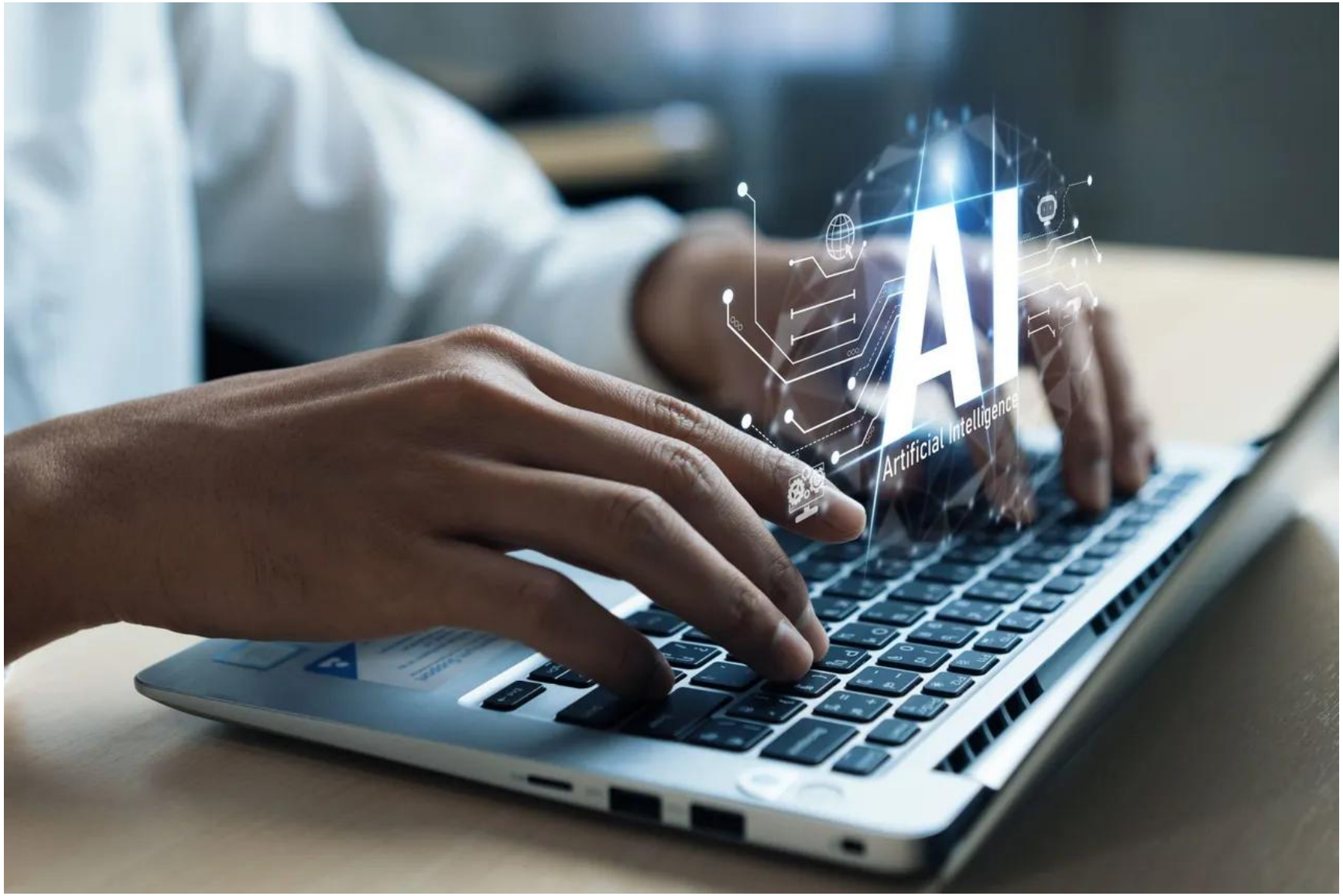
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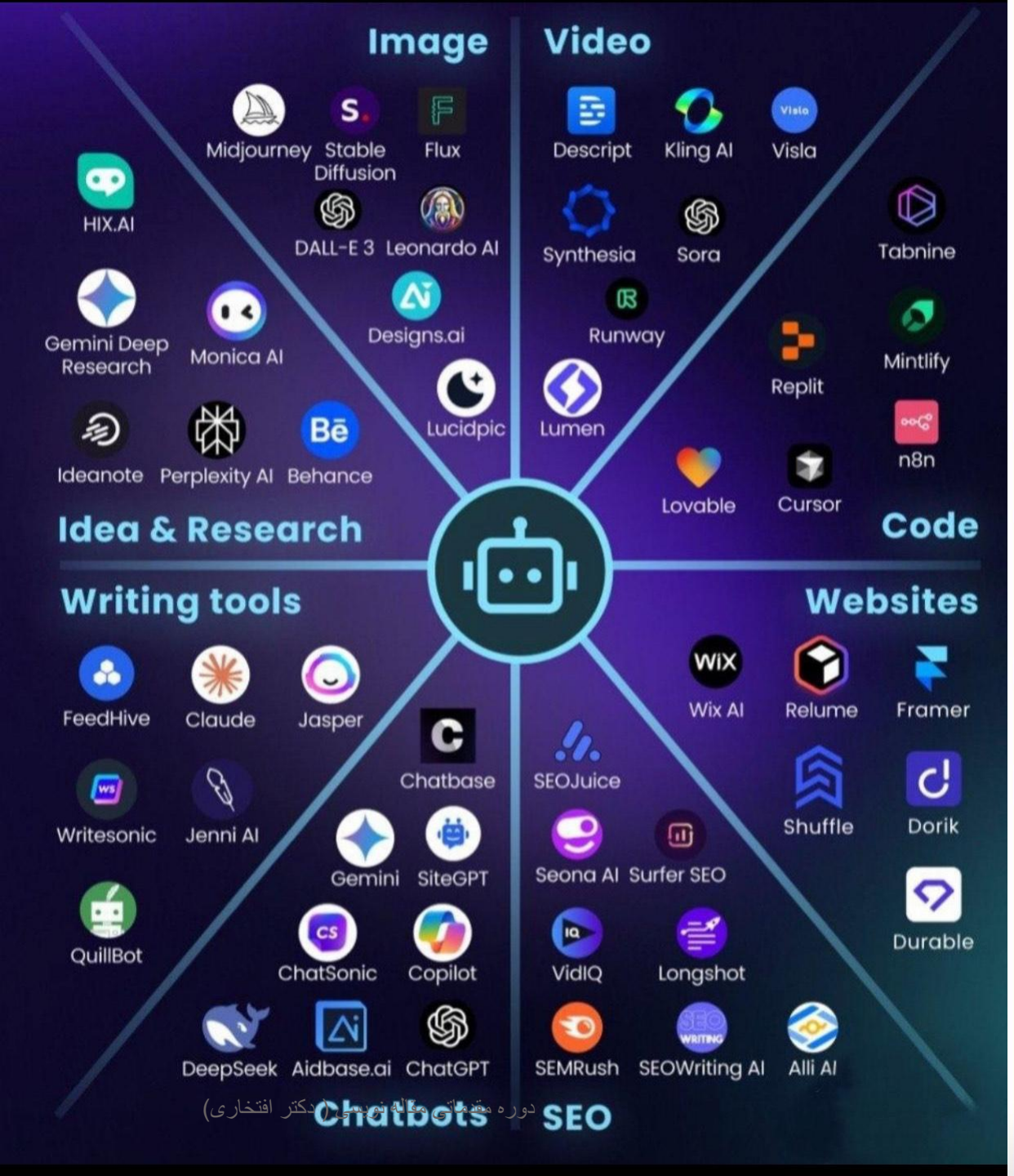

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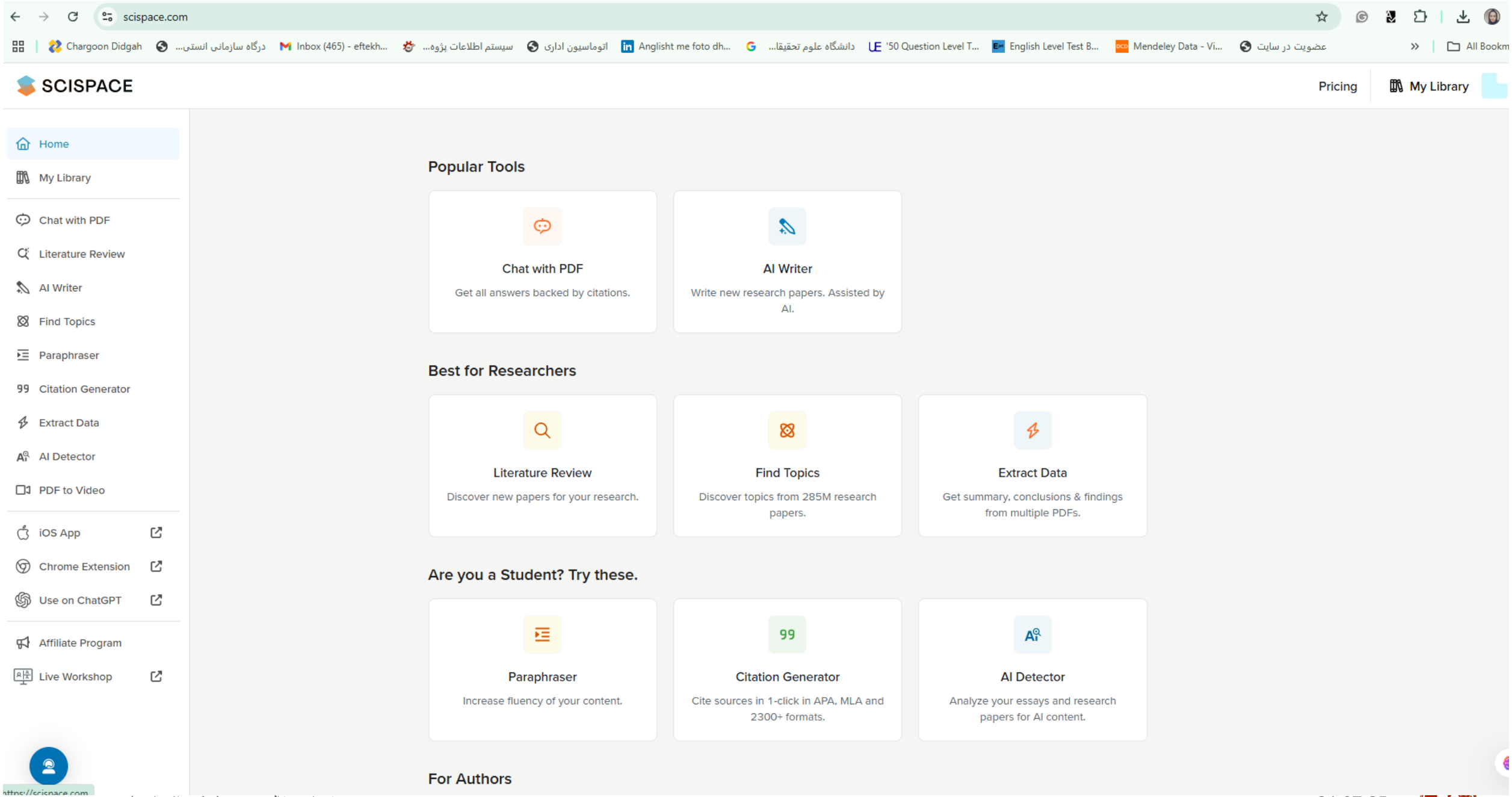
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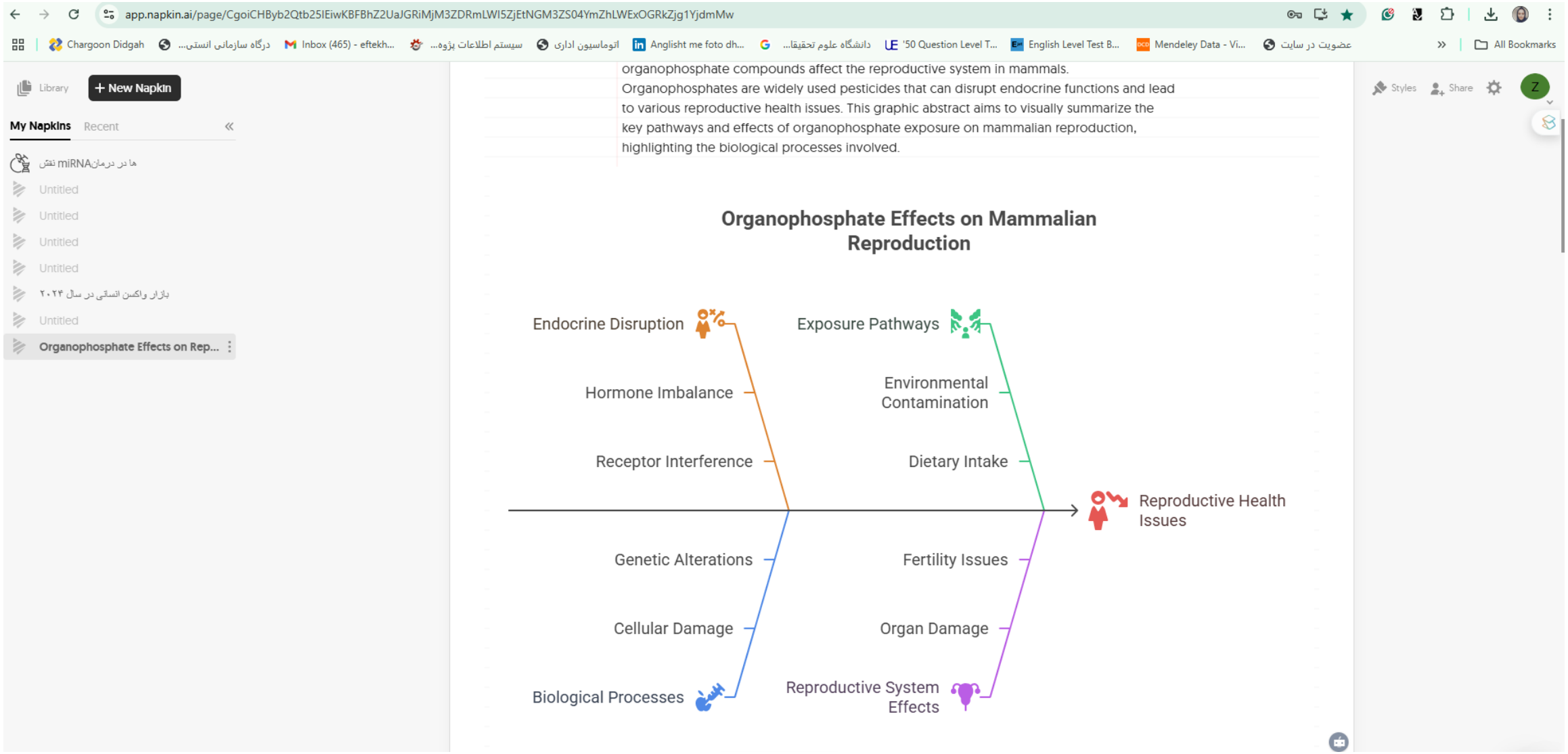
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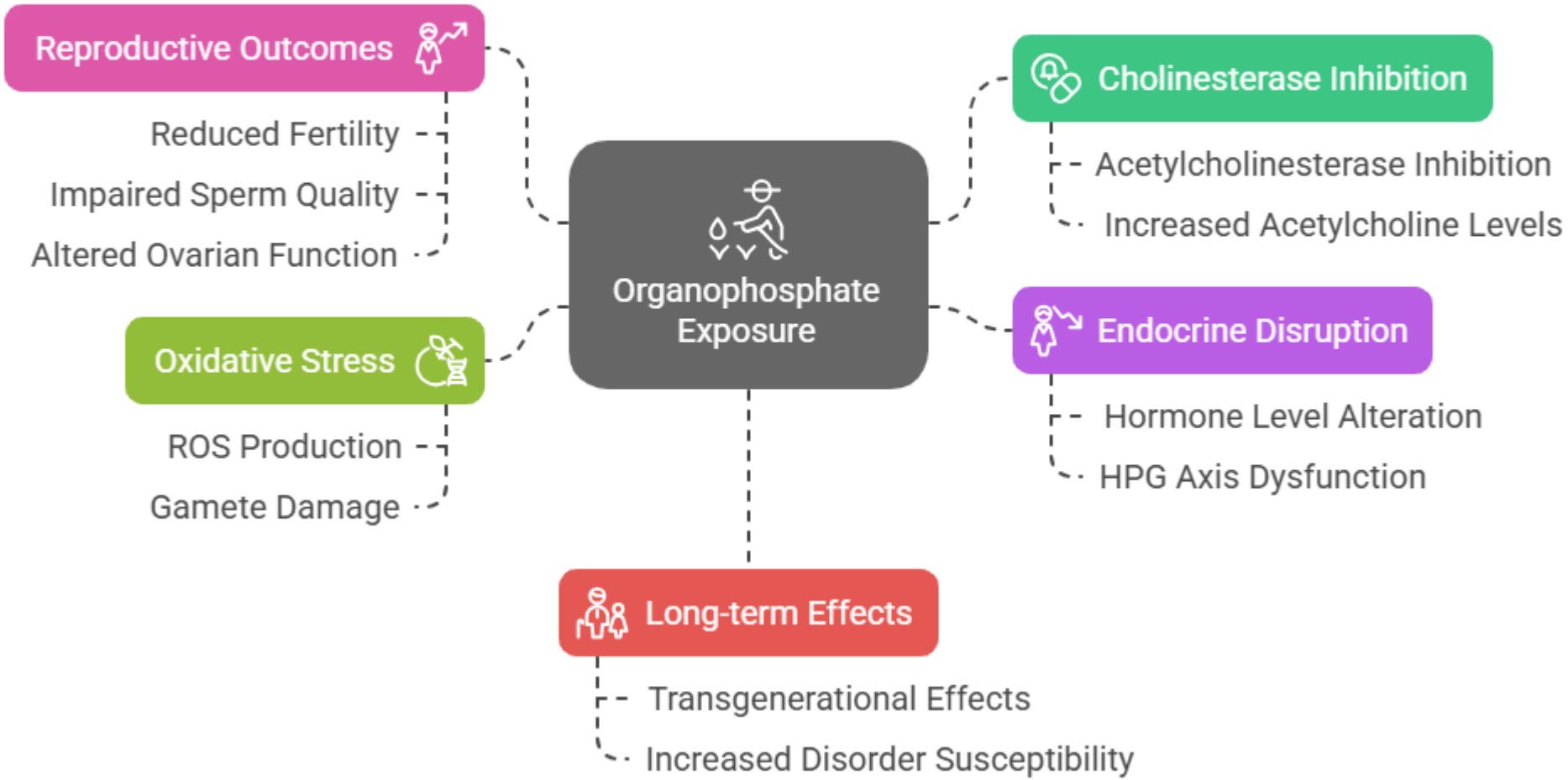
Organophosphate Exposure and Reproductive Health



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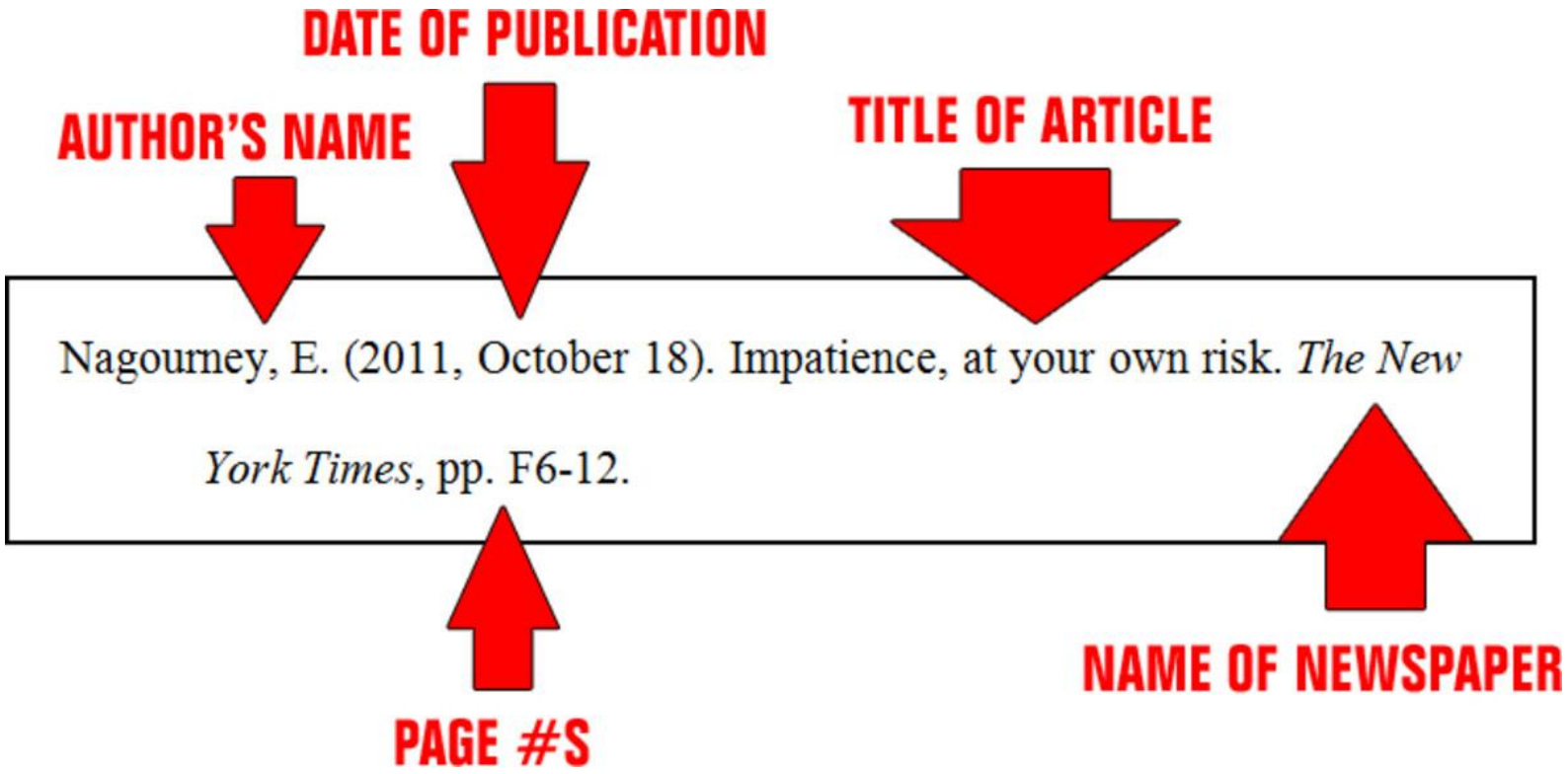
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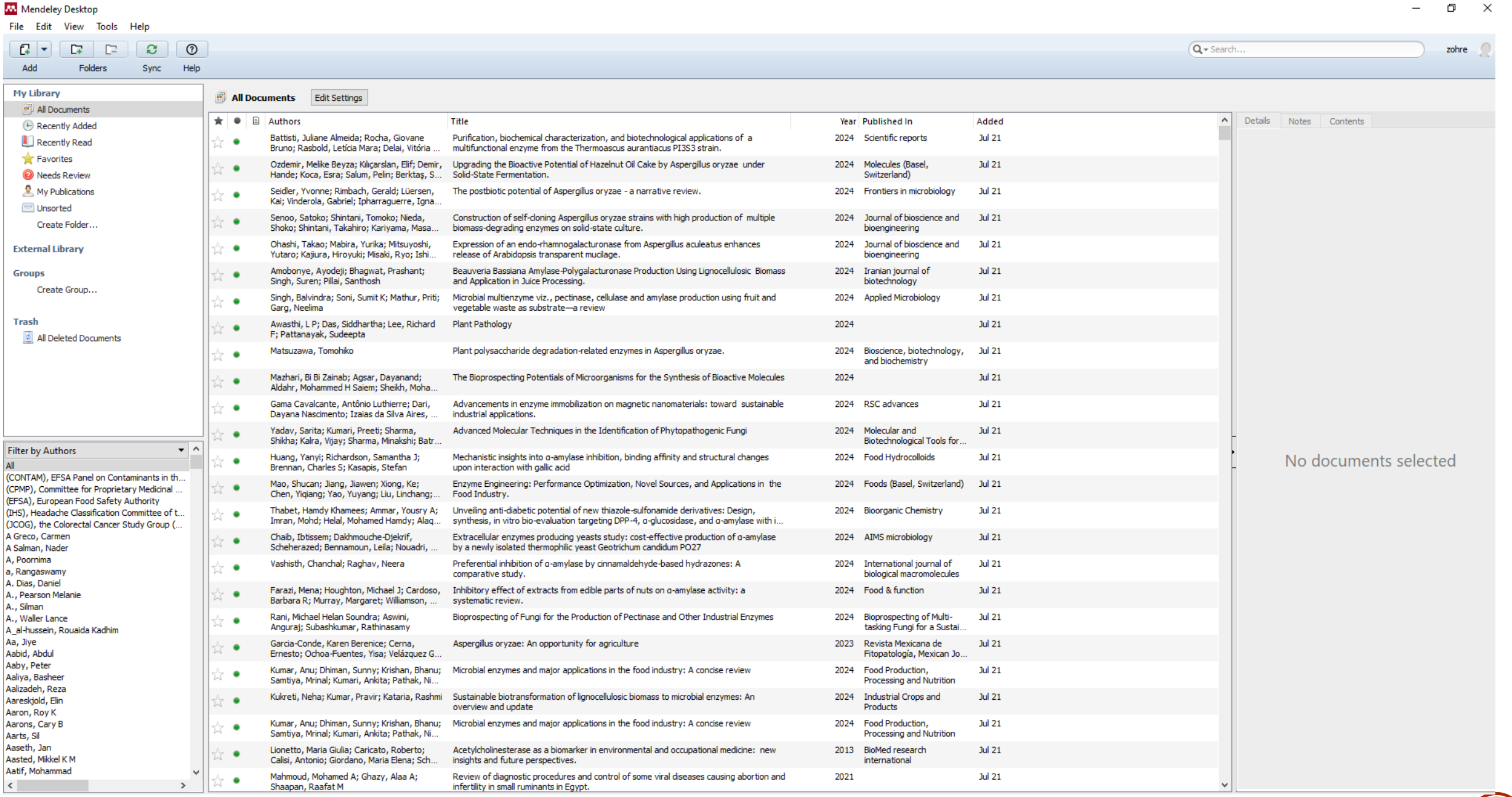
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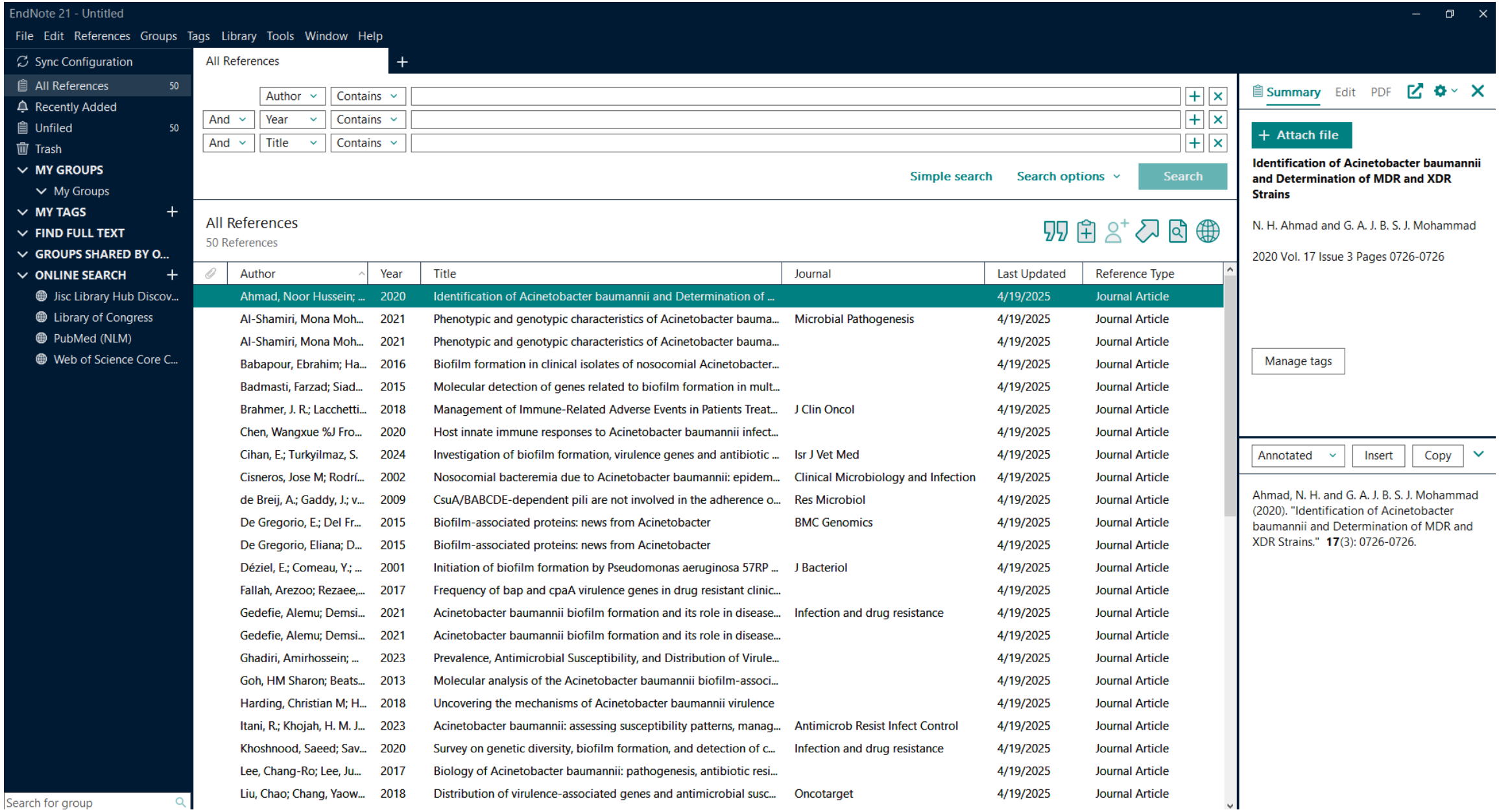
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Al-Shamiri, Mona Moh... 2021 Phenotypic and genotypic characteristics of Acinetobacter bauma... Microbial Pathogenesis 4/19/2025 Journal Article
Al-Shamiri, Mona Moh... 2021 Phenotypic and genotypic characteristics of Acinetobacter bauma... 4/19/2025 Journal Article
Babapour, Ebrahim; Ha... 2016 Biofilm formation in clinical isolates of nosocomial Acinetobacter... 4/19/2025 Journal Article
Badmasti, Farzad; Siad... 2015 Molecular detection of genes related to biofilm formation in mult... 4/19/2025 Journal Article
Brahmer, J. R.; Lacchetti... 2018 Management of Immune-Related Adverse Events in Patients Treat... J Clin Oncol 4/19/2025 Journal Article
Chen, Wangxue %J Fro... 2020 Host innate immune responses to Acinetobacter baumannii infect... 4/19/2025 Journal Article
Cihan, E.; Turkyilmaz, S. 2024 Investigation of biofilm formation, virulence genes and antibiotic ... Isr J Vet Med 4/19/2025 Journal Article
Cisneros, Jose M; Rodrí... 2002 Nosocomial bacteremia due to Acinetobacter baumannii: epidem... Clinical Microbiology and Infection 4/19/2025 Journal Article
de Breij, A.; Gaddy, J.; v... 2009 CsuA/BABCDE-dependent pili are not involved in the adherence o... Res Microbiol 4/19/2025 Journal Article
De Gregorio, E.; Del Fr... 2015 Biofilm-associated proteins: news from Acinetobacter BMC Genomics 4/19/2025 Journal Article
De Gregorio, Eliana; D... 2015 Biofilm-associated proteins: news from Acinetobacter 4/19/2025 Journal Article
Déziel, E.; Comeau, Y.; ... 2001 Initiation of biofilm formation by Pseudomonas aeruginosa 57RP ... J Bacteriol 4/19/2025 Journal Article
Fallah, Arezoo; Rezaee,... 2017 Frequency of bap and cpaA virulence genes in drug resistant clinic... 4/19/2025 Journal Article
Gedefie, Alemu; Demsi... 2021 Acinetobacter baumannii biofilm formation and its role in disease... Infection and drug resistance 4/19/2025 Journal Article
Gedefie, Alemu; Demsi... 2021 Acinetobacter baumannii biofilm formation and its role in disease... 4/19/2025 Journal Article
Ghadiri, Amirhossein; ... 2023 Prevalence, Antimicrobial Susceptibility, and Distribution of Virule... 4/19/2025 Journal Article
Goh, HM Sharon; Beats... 2013 Molecular analysis of the Acinetobacter baumannii biofilm-associ... 4/19/2025 Journal Article
Harding, Christian M; H... 2018 Uncovering the mechanisms of Acinetobacter baumannii virulence 4/19/2025 Journal Article
Itani, R.; Khojah, H. M. J... 2023 Acinetobacter baumannii: assessing susceptibility patterns, manag... Antimicrob Resist Infect Control 4/19/2025 Journal Article
Khoshnood, Saeed; Sav... 2020 Survey on genetic diversity, biofilm formation, and detection of c... Infection and drug resistance 4/19/2025 Journal Article
Lee, Chang-Ro; Lee, Ju... 2017 Biology of Acinetobacter baumannii: pathogenesis, antibiotic resi... 4/19/2025 Journal Article
Liu, Chao; Chang, Yaow... 2018 Distribution of virulence-associated genes and antimicrobial susc... Oncotarget 4/19/2025 Journal Article
Summary Edit PDF
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Identification of Acinetobacter baumannii and Determination of MDR and XDR Strains
N. H. Ahmad and G. A. J. B. S. J. Mohammad
2020 Vol. 17 Issue 3 Pages 0726-0726
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Ahmad, N. H. and G. A. J. B. S. J. Mohammad (2020). "Identification of Acinetobacter baumannii and Determination of MDR and XDR Strains." 17(3): 0726-0726.

HOW AI HELPS IN WRITING SCIENTIFIC ARTICLES

Best AI Tools

Content Creation

copy.ai
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frase
Peppertype.ai
AI-WRITER
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AI Tools for Marketing & Sales

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descript
Otter

Stage of Writing	How AI Helps
1. Idea Generation	Suggests topics, keywords, and research questions
2. Outlining	Creates structured outlines for articles, reviews, or reports
3. Drafting	Generates paragraphs or sections (e.g., Introduction, Abstract)
4. Language Editing	Improves grammar, flow, tone, and clarity (especially for non-native English speakers)
5. Summarization	Summarizes long texts (useful for literature reviews or abstracts)
6. Paraphrasing	Rewrites technical text while preserving meaning
7. Citation Assistance	Finds sources, formats references, or inserts citations
8. Translation	Converts scientific text across languages (e.g., English ↔ Persian)

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Use Cases in Scientific Fields

Field	AI Application Example
Biomedicine	Summarizing large datasets, generating patient cohort descriptions
Computer Science	Writing methods/code descriptions, LaTeX integration
Social Sciences	Summarizing interviews, organizing themes
Pharmaceutical R&D	Drafting regulatory reports, literature reviews
Public Health	Generating policy briefs, risk communication summaries

Ethical Guidelines for AI Use in Scientific Writing

Guideline	Why It Matters
Do not list AI as an author	AI lacks accountability; journals (e.g., Nature, Science) forbid it
Disclose AI assistance	Transparency builds trust (e.g., “AI-assisted language editing”)
Avoid AI hallucinations	Always fact-check generated content — AI may invent references
Do not plagiarize via AI	Paraphrased content still needs proper citation
Check journal policies	Some restrict AI-generated content or require disclosure

SEARCH THE ARTICLE

89

Methods for Finding Articles:

- Using Search Engines and Databases:

General Search Engines: Try using **Google Scholar** for scholarly articles, or even a general search engine with precise keywords.

Library Databases: Your university or local library likely subscribes to various databases that offer access to academic journals, newspapers, and magazines. Look for options like "Easy Search" or "Online Journals and Databases" on your library's website.

Specialized Databases: Beyond general search engines, consider databases like **PubMed Central** for medical research, **Microsoft Academic Search**, or **Worldcat**.

- Search Strategies:

Keywords: Start with relevant keywords from your topic and refine your search terms.

Advanced Search: Utilize advanced search features within databases to specify fields (like title or subject) and use Boolean operators (AND, OR, NOT) for more precise results.

Quotation Marks or Parentheses: For exact phrases, enclose your search terms in quotation marks or parentheses (e.g., "climate change" or (global warming)).

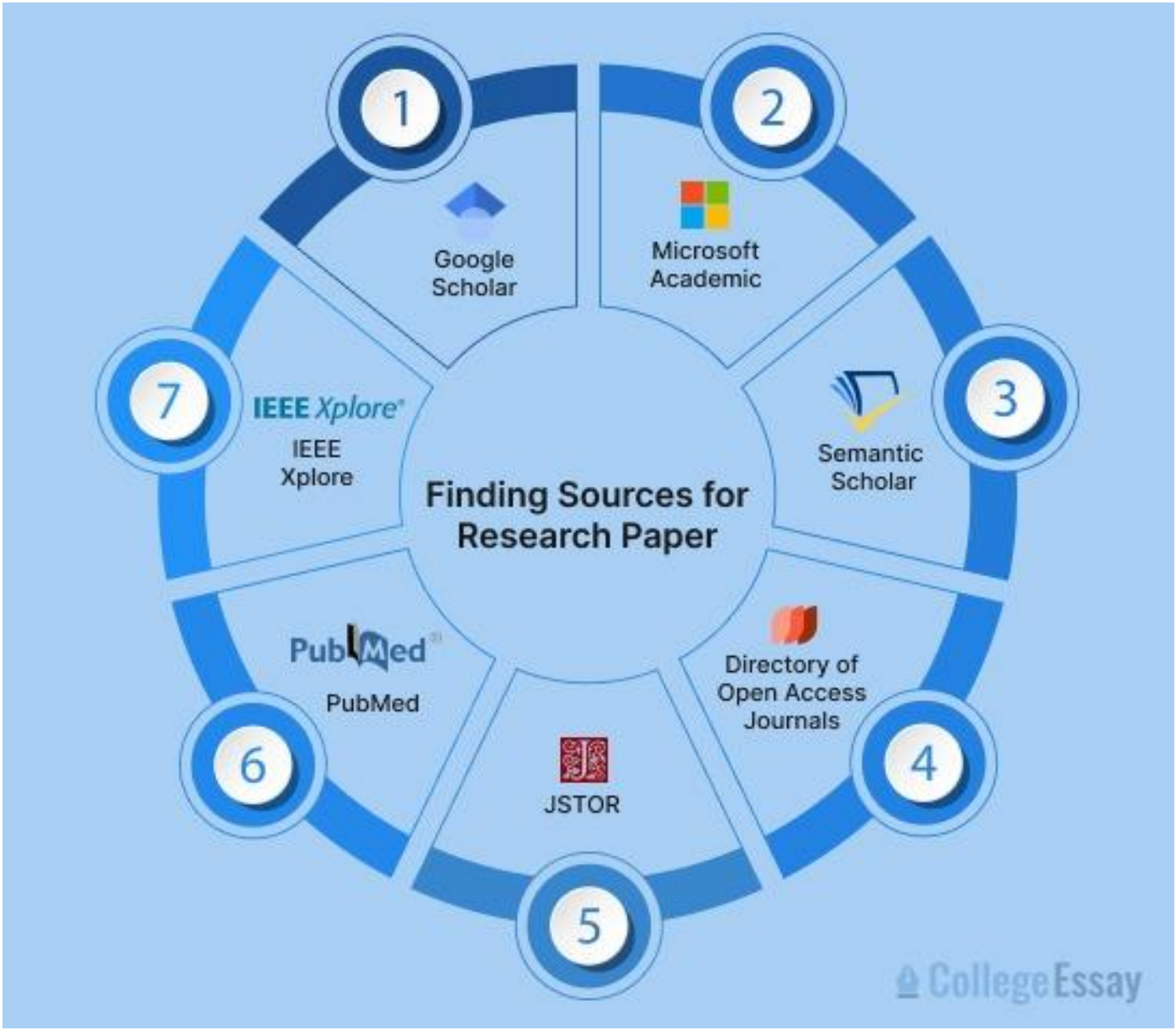
- Searching within an Article:

Find Function (Ctrl+F):

Once you have an article open in a browser or PDF viewer, press Ctrl+F (on Windows/Linux) or Command+F (on Mac) to open a search box within the document.

Type and Search:

Enter the word or phrase you're looking for in the search box and press Enter.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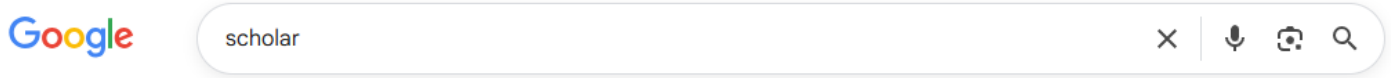

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Semantic Scholar
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Semantic Scholar | AI-Powered Research Tool

Semantic Scholar uses groundbreaking AI and engineering to understand the semantics of scientific literature to help Scholars discover relevant research.

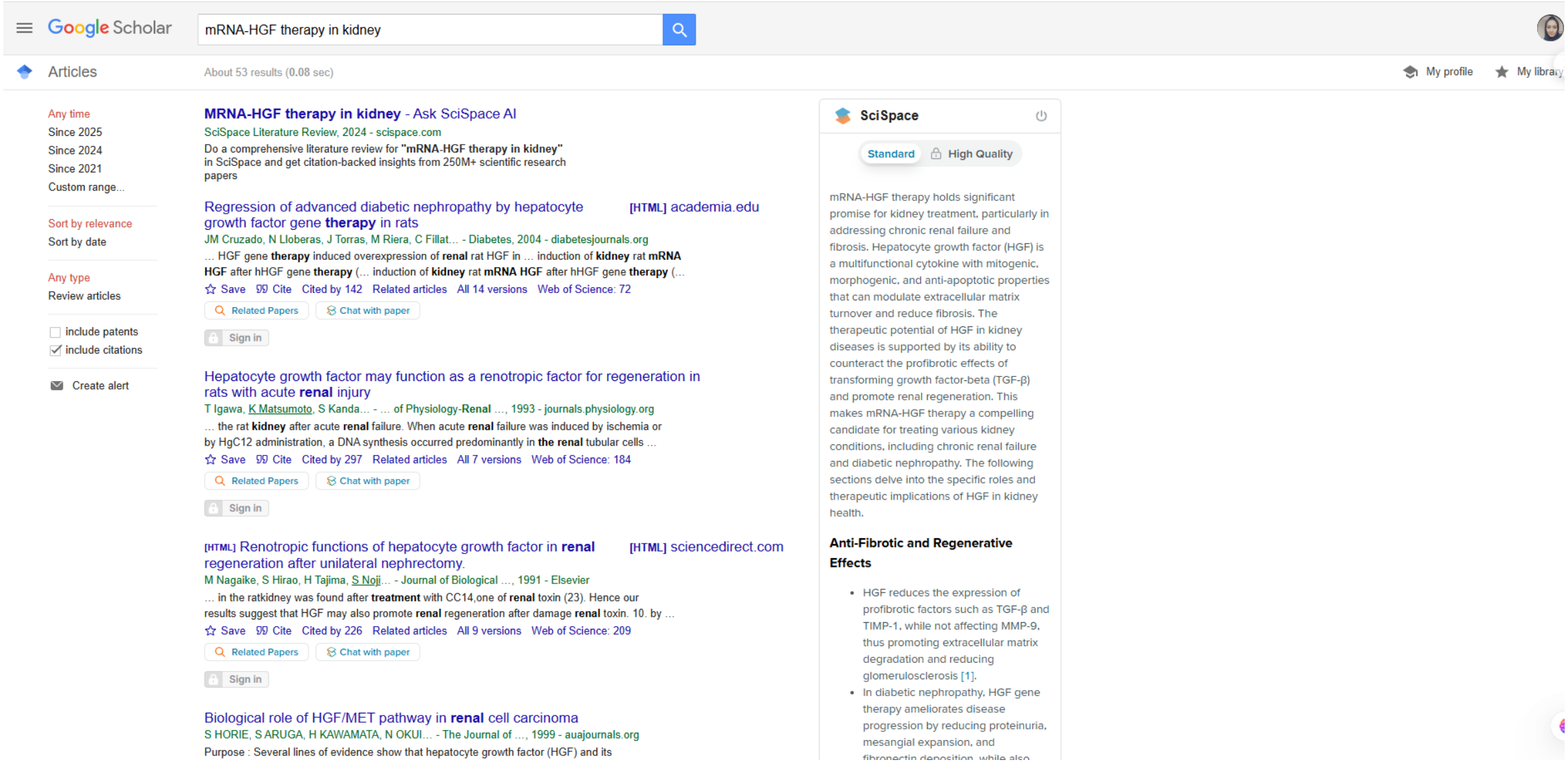
Sider

Sider Fusion | GPT-4o

Google Scholar and Semantic Scholar are platforms used to search scholarly literature across various disciplines. They provide access to articles, theses, and other sources. Semantic Scholar utilizes AI to understand the context of research. Both tools help scholars discover relevant research and compare data. Various functions are available to extract and compare citation data. These platforms are designed to facilitate and broaden the scope of academic research.

Related questions:

How does Semantic Scholar's AI work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SciSpace Literature Review, 2024 - scispace.com
Do a comprehensive literature review for "mRNA-HGF therapy in kidney" in SciSpace and get citation-backed insights from 250M+ scientific research papers
Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats
[HTML] academia.edu
JM Cruzado, N Lloberas, J Torras, M Riera, C Fillat... - Diabetes, 2004 - diabetesjournals.org
... HGF gene therapy induced overexpression of renal rat HGF in ... induction of kidney rat mRNA HGF after hHGF gene therapy (... induction of kidney rat mRNA HGF after hHGF gene therapy (...
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Hepatocyte growth factor may function as a renotropic factor for regeneration in rats with acute renal injury
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... the rat kidney after acute renal failure. When acute renal failure was induced by ischemia or by HgC12 administration, a DNA synthesis occurred predominantly in the renal tubular cells ...
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M Nagaike, S Hirao, H Tajima, S Noji... - Journal of Biological ..., 1991 - Elsevier
... in the ratkidney was found after treatment with CC14,one of renal toxin (23). Hence our results suggest that HGF may also promote renal regeneration after damage renal toxin. 10. by ...
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Biological role of HGF/MET pathway in renal cell carcinoma
S HORIE, S ARUGA, H KAWAMATA, N OKUI... - The Journal of ..., 1999 - auajournals.org
Purpose : Several lines of evidence show that hepatocyte growth factor (HGF) and its
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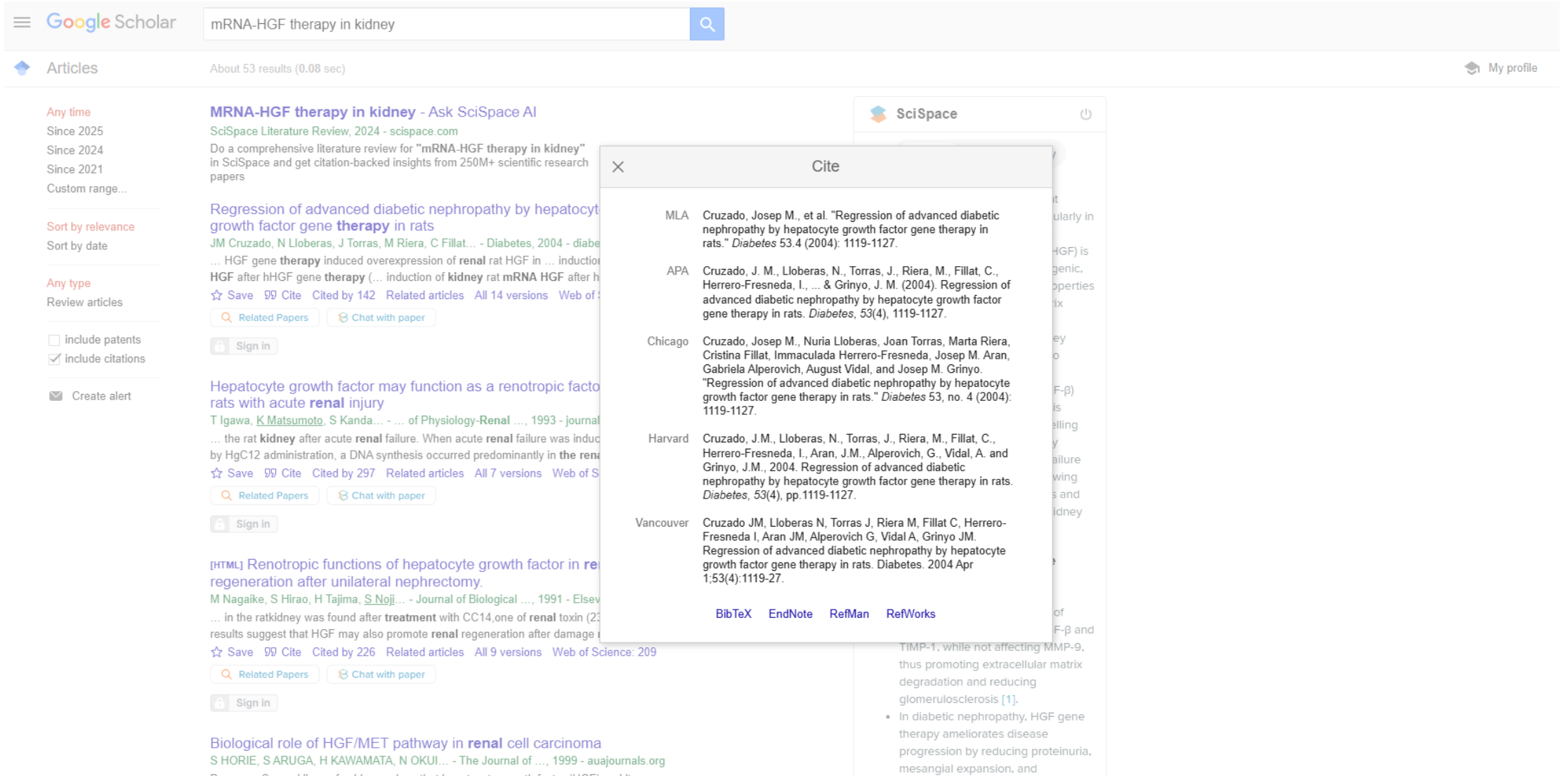
mRNA-HGF therapy holds significant promise for kidney treatment, particularly in addressing chronic renal failure and fibrosis. Hepatocyte growth factor (HGF) is a multifunctional cytokine with mitogenic, morphogenic, and anti-apoptotic properties that can modulate extracellular matrix turnover and reduce fibrosis. The therapeutic potential of HGF in kidney diseases is supported by its ability to counteract the profibrotic effects of transforming growth factor-beta (TGF-β) and promote renal regeneration. This makes mRNA-HGF therapy a compelling candidate for treating various kidney conditions, including chronic renal failure and diabetic nephropathy. The following sections delve into the specific roles and therapeutic implications of HGF in kidney health.
Anti-Fibrotic and Regenerative Effects
HGF reduces the expression of profibrotic factors such as TGF-β and TIMP-1, while not affecting MMP-9, thus promoting extracellular matrix degradation and reducing glomerulosclerosis [1].
In diabetic nephropathy, HGF gene therapy ameliorates disease progression by reducing proteinuria, mesangial expansion, and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MRNA-HGF therapy in kidney - Ask SciSpace AI
SciSpace Literature Review, 2024 - scispace.com
Do a comprehensive literature review for "mRNA-HGF therapy in kidney" in SciSpace and get citation-backed insights from 250M+ scientific research papers
Regression of advanced diabetic nephropathy by hepatocyt
growth factor gene therapy in rats
JM Cruzado, N Lloberas, J Torras, M Riera, C Fillat... - Diabetes, 2004 - diabe
... HGF gene therapy induced overexpression of renal rat HGF in ... induction
HGF after hHGF gene therapy (... induction of kidney rat mRNA HGF after h
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Hepatocyte growth factor may function as a renotropic facto
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T Igawa, K Matsumoto, S Kanda... - ... of Physiology-Renal ..., 1993 - journal
... the rat kidney after acute renal failure. When acute renal failure was induc
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M Nagaike, S Hirao, H Tajima, S Noji... - Journal of Biological ..., 1991 - Elsev
... in the ratkidney was found after treatment with CC14,one of renal toxin (2
results suggest that HGF may also promote renal regeneration after damage
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S HORIE, S ARUGA, H KAWAMATA, N OKUI... - The Journal of ..., 1999 - auajournals.org
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MLA Cruzado, Josep M., et al. "Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats." Diabetes 53.4 (2004): 1119-1127.
APA Cruzado, J. M., Lloberas, N., Torras, J., Riera, M., Fillat, C., Herrero-Fresneda, I., ... & Grinyo, J. M. (2004). Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats. Diabetes, 53(4), 1119-1127.
Chicago Cruzado, Josep M., Nuria Lloberas, Joan Torras, Marta Riera, Cristina Fillat, Immaculada Herrero-Fresneda, Josep M. Aran, Gabriela Alperovich, August Vidal, and Josep M. Grinyo. "Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats." Diabetes 53, no. 4 (2004): 1119-1127.
Harvard Cruzado, J.M., Lloberas, N., Torras, J., Riera, M., Fillat, C., Herrero-Fresneda, I., Aran, J.M., Alperovich, G., Vidal, A. and Grinyo, J.M., 2004. Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats. Diabetes, 53(4), pp.1119-1127.
Vancouver Cruzado JM, Lloberas N, Torras J, Riera M, Fillat C, Herrero-Fresneda I, Aran JM, Alperovich G, Vidal A, Grinyo JM. Regression of advanced diabetic nephropathy by hepatocyte growth factor gene therapy in rats. Diabetes. 2004 Apr 1;53(4):1119-27.
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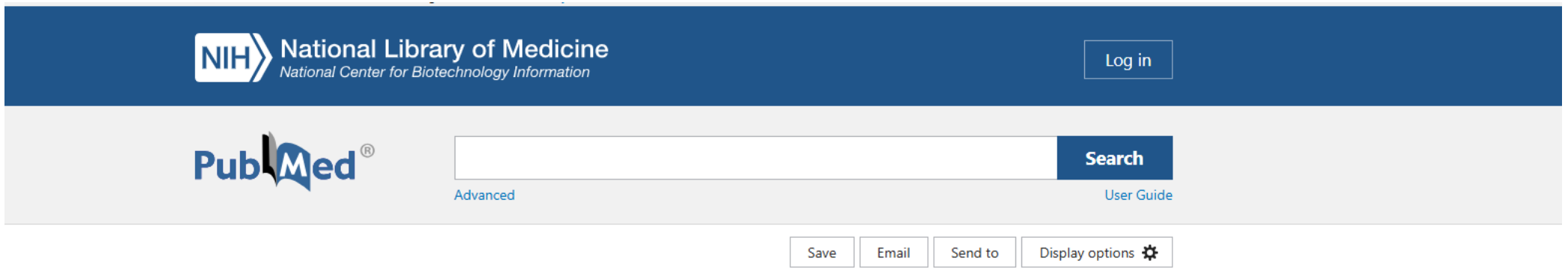

Am J Physiol. 1993 Jul;265(1 Pt 2):F61-9. doi: 10.1152/ajprenal.1993.265.1.F61.

Hepatocyte growth factor may function as a renotropic factor for regeneration in rats with acute renal injury

T Igawa [1], K Matsumoto, S Kanda, Y Saito, T Nakamura

Affiliations + expand

PMID: 8342615 DOI: 10.1152/ajprenal.1993.265.1.F61

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Abstract

Hepatocyte growth factor (HGF), a potent mitogen for mature hepatocytes, possesses mitogenic and morphogenic activities for renal epithelial cells. To examine the renotropic function of HGF, we

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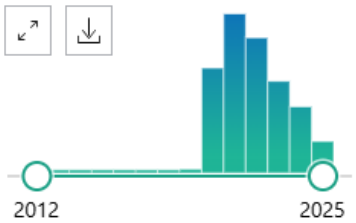

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Liakopoulos V, Roumeliotis S, Papachristou S, Papanas N.

Int Urol Nephrol. 2022 May;54(5):1053-1057. doi: 10.1007/s11255-021-02976-7. Epub 2021 Aug 12.

PMID: 34383205 Free PMC article. Review.

Although **coronavirus** disease (**COVID-19**) is primarily a respiratory disease, the **kidney** may be among the target organs of infection with **severe acute respiratory syndrome coronavirus 2** (**SARS-COV-** ...

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Kidney involvement in COVID-19 and its treatments.

Han X, Ye Q.

J Med Virol. 2021 Mar;93(3):1387-1395. doi: 10.1002/jmv.26653. Epub 2020 Nov 22.

PMID: 33150973 Review.

The lungs are the most commonly affected organ by **severe acute respiratory syndrome coronavirus 2** (**SARS-CoV-2**), but the **kidneys** are also frequently affected. ...**Kidney** involvement in **SARS-CoV** ...

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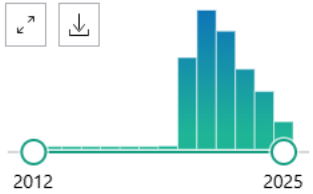

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PMID: 33150973 Review.

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COVID-19 and **kidney** disease: insights from epidemiology to inform clinical practice.

Mahalingasivam V, Su G, Iwagami M, Davids MR, Wetmore JB, Nitsch D.

Nat Rev Nephrol. 2022 Aug;18(8):485-498. doi: 10.1038/s41581-022-00570-3. Epub 2022 Apr 13.

PMID: 35418695 Free PMC article. Review.

Over the course of the **COVID-19** pandemic, numerous studies have aimed to address the challenges faced by patients with **kidney** disease and their caregivers. ...However, the ability to draw meaningful conclusions from these studies has in some instances been ch ...

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2012

New species of Limipolycystis Schilke, 1970 (Rhabdocoela: Kalyptorhynchia: Polycystididae) from the Western Mediterranean

T. Artois, W. Willems, N. Revis, P. Martens, E. Schockaert • 2012 • Corpus ID: 90223553

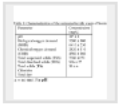
Five new species of Limipolycystis Schilke, 1970 are described and their morphology is compared to that of the only spe-cies... Expand

2011

Evaluation of Microbial Systems for Biotreatment of Textile Waste Effluents in Nigeria: Biodecolourization and Biodegradation of textile Dye

S. Agarry, A. Ajani • 2011 • Corpus ID: 32043293

The evaluation of some microbial species for the decolourization and degradation of textile dye has been investigated. Six... Expand



FINDING THE SUBJECT OF ARTICLE

IDENTIFY THE CORE ELEMENTS OF YOUR STUDY

- Ask yourself:

✓What is the main topic or problem you addressed?

✓What is your main method or approach?

✓What are the main findings or contributions?

✓What is the model or system (e.g., cell line, animal model, disease, etc.)?

DECIDE ON TITLE TYPE

- There are three common types of titles:
- ✓Descriptive: States what the paper is about.
- ✓Example: “Characterization of Kv1.3 Channel Inhibition by a Scorpion-Derived Peptide in Breast Cancer Cells”
- ✓Declarative: States the main finding.
- ✓Example: “A Scorpion Toxin Inhibits Kv1.3 Channels and Suppresses Angiogenesis in EMT-Induced Breast Cancer Cells”
- ✓Question-based: Less common in experimental research.
- ✓Example: “Can a Scorpion Peptide Be Used to Inhibit Kv1.3 and Tumor Progression?”

STRUCTURE THE TITLE

- Common elements to include:
  - ✓Key target (e.g., Kv1.3 channel)
  - ✓Main method/tool (e.g., peptide inhibitor, nanoparticles)
  - ✓Biological system (e.g., breast cancer cells, rat model of arthritis)
  - ✓Outcome or goal (e.g., therapeutic potential, gene expression, angiogenesis)

AI Tools for Generating Article Titles from Keywords

Jenni AI –Title Generator

•Link: https://jenni.ai/tools/title-generator

- Input: Keywords or topic
- Output: Multiple title suggestions instantly
- Strength: Fast, intuitive, and tailored for research or academic writing

Scribbr Title Generator

•Link: https://www.scribbr.com/academic-essay/title-generator/

- Input: Keywords + topic
- Output: 10 –5titles
- Use: Better for structured academic titles (may need refinement for scientific tone)

Rytr.me

•Link: https://rytr.me

- Input: Keywords + tone + writing type (e.g., blog, research, idea)
- Output: AI-generated titles, summaries, or intros
- Note: Select “Idea ”or “Research ”in the template section

Title Generator by INK AI

•Link: https://inkforall.com/ai-writing-tools/title-generator/

- Input: Just enter your keywords or phrase
- Output: Title suggestions with various tones
- Good for both technical and non-technical writing

FUNDAMENTALS OF WRITING A SCIENTIFIC ARTICLE

TITLE

- The title should be precise, clear, and appropriate.
- It should seek the attention of the reader.
- It should reflect the setting or procedure of the study and result if possible.
- Do not exaggerate the subject of the title.
- It should be self-explanatory, yet not too lengthy.

- Creating a strong title for your scientific article is important — it should be concise, informative, and reflect the core findings of your research.
- **A good title usually includes:**

✓What was studied (e.g., a peptide, nanoparticle, or disease model)

✓How it was studied (e.g., in vitro, in vivo, in cancer or inflammation models)

✓What was found or implied (e.g., inhibition, therapeutic potential)

- **Title Formula Options**

1. Descriptive + Mechanism

A Scorpion-Derived Peptide Inhibits Kv1.3 Channels and Suppresses Breast Cancer Cell Invasiveness and Inflammation

2. Therapeutic Angle + Model

Nanoparticle-Delivered Kv1.3 Blocker MeuKTx Attenuates Inflammation and Cancer Cell Migration: A Dual-Action Strategy

3. Structure + Application

Chitosan-Encapsulated Scorpion Toxin MeuKTx Targets Kv1.3 Channels in Breast Cancer and Arthritis Models

4. General + Specific

Targeting Kv1.3 with a Scorpion Peptide: Anti-Cancer and Anti-Inflammatory Effects Enhanced by Chitosan Nanoparticles

- **Suggested Titles Based on Your Study**
- Here are 3 tailored title suggestions for your research:
  - **Option 1 (Balanced, direct):**

Dual Anti-Cancer and Anti-Inflammatory Effects of the Kv1.3-Blocking Peptide MeuKTx Encapsulated in Chitosan Nanoparticles

  - **Option 2 (More technical):**

Kv1.3 Channel Inhibition by Nanoparticle-Delivered Scorpion Peptide MeuKTx Suppresses EMT Phenotype and Inflammation

  - **Option 3 (For a broader audience):**

A Scorpion Peptide Nanomedicine Targeting Kv1.3 for Breast Cancer and Inflammatory Joint Disease

ABSTRACT

- Most of the readers prefer to read the abstract rather than reading a full article.
- Hence, the abstract should include important summary features of the study.
- It should begin with background knowledge and lacunae in the literature.
- It should reflect material and methods and main results with a concluding line.
- The abstract is of three main types:
- (a) Structured abstract that is grouped into foreground, objectives, material and methods, results, conclusion, and clinical significance;
- (b) indicative abstract is written as a single paragraph;
- (c) informative abstract that forms an integral part of an original article.

✓**Background**

✓Voltage-gated potassium channel Kv1.3 is implicated in the regulation of both immune cell activation and cancer cell behavior. Targeting Kv1.3 has shown therapeutic promise in autoimmune diseases, but its role in cancer, particularly in epithelial-to-mesenchymal transition (EMT)-driven breast cancer, remains underexplored.

✓**Objective**

✓This study aimed to evaluate the therapeutic potential of MeuKTx, a scorpion venom-derived peptide that selectively blocks Kv1.3, in breast cancer and inflammatory models, and to enhance its delivery using chitosan nanoparticles.

✓**Methods**

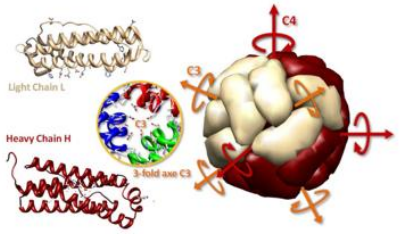
✓MeuKTx was chemically synthesized and encapsulated in chitosan nanoparticles via ionic gelation. Cytotoxicity, migration, invasion, and angiogenesis assays were performed on MCF-7 and MCF-7/EMT cells and HUVEC cells. Expression of Kv1.3 was analyzed using qPCR and Western blotting. An in vivo neonatal rat model of rheumatoid arthritis was used to assess anti-inflammatory effects. Histological evaluation and expression of inflammatory markers were conducted.

✓ Results

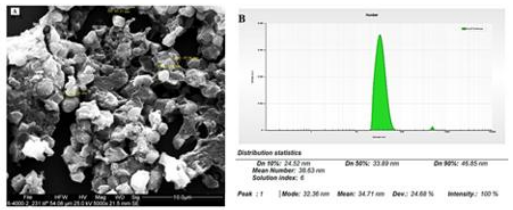
✓ Encapsulated MeuKTx showed higher cellular uptake and cytotoxicity compared to the free peptide. It significantly downregulated Kv1.3 expression, reduced migration and invasion in EMT-induced breast cancer cells, and inhibited angiogenesis in vitro. In the arthritis model, both free and encapsulated MeuKTx reduced joint inflammation, suppressed proinflammatory cytokines (TNF-α, IL-6), and downregulated Kv1.3 and NF-κB expression.

✓ Conclusion

✓ These findings highlight MeuKTx as a dual-action peptide therapeutic with anti-cancer and anti-inflammatory properties. Chitosan nanoparticle encapsulation enhances its bioactivity, offering a promising strategy for targeted Kv1.3 inhibition in oncology and immunotherapy.

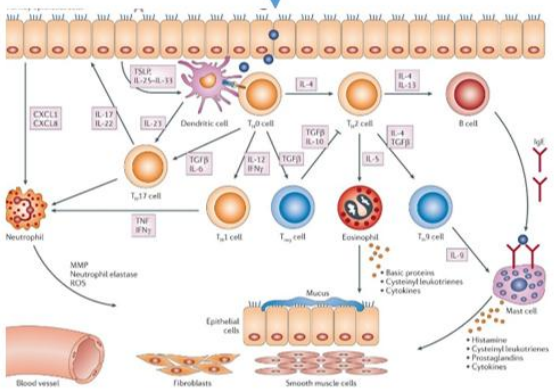


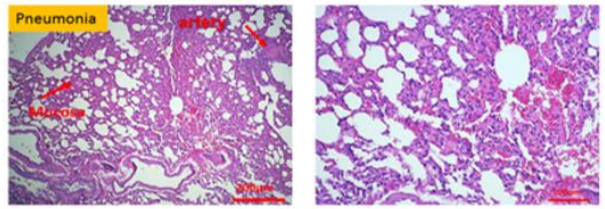
Glycyrrhiza glabra Saponin encapsulated with Ferritin



Encapsulated saponin by ferritin nanoparticles

Pneumonia induction with *Streptococcus pneumonia*





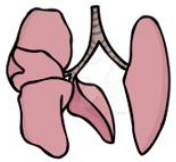
Pathological damages of lung

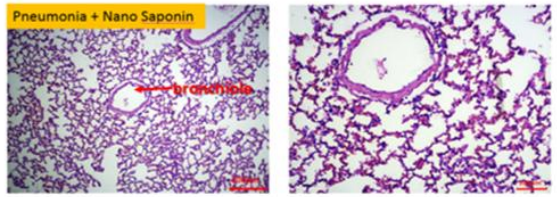
Nano Saponin

↓Cox2 Pr expression,

↓Tnf-α Gene expression

↓IL-4 sera level





Protective effect of NanoSaponin

The following points should always be featured

- **Purpose:** This is where you explain 'why' you undertook this study. If you are presenting new or novel research, explain the problem that you have solved. If you are building upon previous research, briefly explain why you felt it was important to do so. This is your opportunity to let readers know why you chose to study this topic or problem and its relevance. Let them know what your key argument or main finding is.
- **Study design/methodology/approach:** This is 'how' you did it. Let readers know exactly what you did to reach your results. For example, did you undertake interviews? Did you carry out an experiment in the lab? What tools, methods, protocols or datasets did you use?
- **Findings:** Here you can explain 'what' you found during your study, whether it answers the problem you set out to explore, and whether your hypothesis was confirmed. You need to be very clear and direct and give exact figures, rather than generalise. It's important not to exaggerate or create an expectation that your paper won't fulfil.
- **Originality/value:** This is your opportunity to make a clear and succinct case for the value of your results. It's a good idea to ask colleagues whether your analysis is balanced and fair and again, it's important not to exaggerate. You can also reflect on what future research steps could be.

KEYWORDS

- This section consists of nouns (words) or 2–4 phrases extracted from the research article that helps the reader to find your article when he/she conducts a search on the relevant topic.
- Avoid too long keywords (phrases).

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Visit our Annual MeSH Processing (AMP) page to see all recent MeSH developments including the most recent ones listed below

- 2025 MeSH files are now in production
  - MeSH Browser now displays 2024 and 2025 MeSH vocabularies
  - Reports of MeSH changes now appear on our Annual MeSH Processing (AMP) page
  - All 2025 MeSH files are now available on the MeSH Download Page
- MeSH in Resource Description Format(RDF)
  - MeSH RDF FTP now contain 2025 MeSH in RDF format
  - An open MeSH API is available for retrieving MeSH data

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Related MeSH Efforts

- RxNorm: A drug vocabulary used for e-prescribing, formulary, medication history, government reporting, drug compendia mapping, and other uses
- Daily Med: Provides trustworthy information about marketed drugs in the United States
- Unified Medical Language System (UMLS®) Metathesaurus: A collection of biomedical names and codes grouped as sets of synonyms, derived from over 150 medical vocabulary sources.
- NLM Classification: A NLM vocabulary used for the arrangement of library materials in the field of medicine and related sciences.

User Input and Suggestions

Suggestions for Finding Author Keywords using MeSH Tools

The following are general suggestions for authors of journal articles who are interested in selecting MeSH descriptors (terms) as key words for their articles. Instructions to Authors vary for different journals; the specific journal should be consulted before selecting keywords. The NLM is not able to provide individual assistance in selecting keywords for journal articles; individual, personalized assistance should be sought from your local medical library.

MeSH Tools for finding Keywords

MeSH provides two tools to help authors select MeSH descriptors as key words for articles.

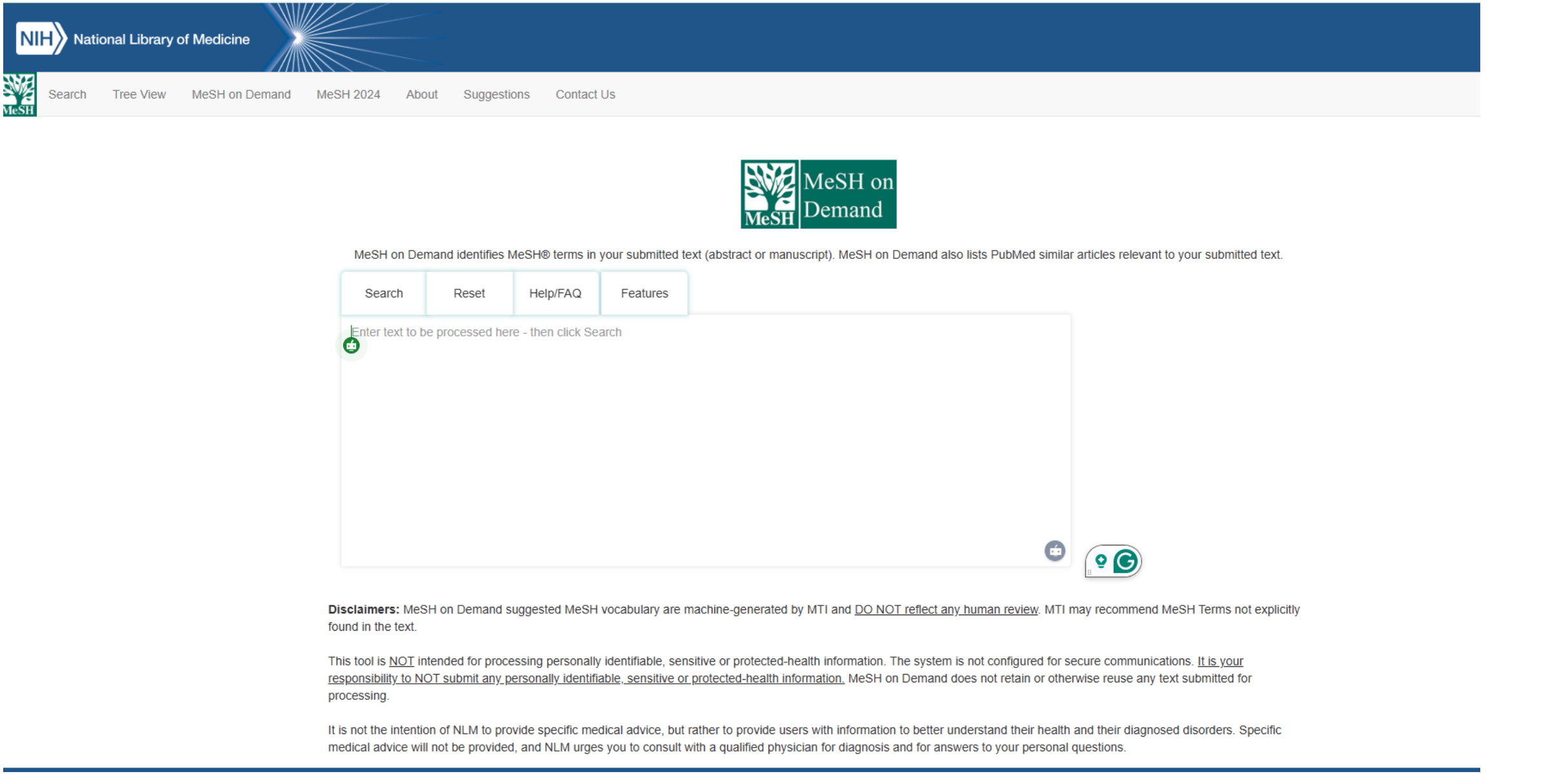
MeSH on Demand

MeSH on Demand is a tool that can automatically identify relevant MeSH terms from text such as an abstract or grant summary. It uses natural language processing (NLP) and the NLM Medical Text Indexer (MTI) to find MeSH terms. While the results will be different from human-generated indexing, MeSH on Demand does find relevant MeSH terms that can help jump-start finding MeSH terms in your search area. Note that these MeSH terms are machine generated by MTI and do not reflect any human review. This tool has been developed in close collaboration among the MeSH Team, NLM Indexers, and the Lister Hill National Center for Biomedical Communications.

The MeSH Browser

This tool allows users to search directly for MeSH terms, and conduct text-word searches of the Annotation, and Scope Note fields of records. The Registry Number (RN) and Related Registry Number (RR) can be also be searched to find Chemical headings. To search the MeSH Browser, locate a vocabulary term using any word in an expression or using the complete expression. Select the most specific heading. For example, "feedback" can be used to find "Feedback, Biochemical" or "Feedback (Psychology)" as well as other expressions containing the word "feedback." Start with specific words or short expressions. Consider using two or three terms to best describe the essential subject(s) of your article. It is best to avoid entering a sentence or article title as the results may not be of use.

Direct Browsing of MeSH Hierarchy (Trees) Headings may also be found by browsing through the MeSH Trees. To do this click the "Navigate from tree top" button at the top of the MeSH browser page. The "Trees" or hierarchical structure of MeSH provided by MeSH Tree Numbers makes it possible to view terms in the context of broader and narrower concepts. To see a term's location in the hierarchy, click on the heading's "Tree Number" entry in the record display. The plus ("+") symbol in the hierarchical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It is not the intention of NLM to provide specific medical advice, but rather to provide users with information to better understand their health and their diagnosed disorders. Specific medical advice will not be provided, and NLM urges you to consult with a qualified physician for diagnosis and for answers to your personal questions.

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Testicular ischemia-reperfusion TIR injury poses a significant challenge to male reproductive health primarily driven by oxidative stress and apoptosis This study investigated the therapeutic potential of niosomal hesperidin a nanoformulated flavonoid in modulating key apoptotic gene expression and mitigating damage in a rat model of testicular TIR Adult male Wistar rats were subjected to 720 testicular torsion-detorsion to induce TIR and subsequently treated orally with either free hesperidin or niosomal hesperidin for 30 days Biochemical assays histological evaluations sperm analyses and quantitative PCR were performed to assess oxidative damage and the expression of p53 and Caspase3 The TIR group exhibited significant testicular tissue damage elevated malondialdehyde MDA levels and increased expression of apoptotic markers Treatment with niosomal hesperidin markedly reduced these adverse effects preserving seminiferous tubule structure improving spermatogenic parameters motility viability count morphology and more effectively downregulating P53 and Caspase3 expression compared to free hesperidin Niosomal hesperidin demonstrated superior anti-apoptotic and antioxidant effects highlighting its potential as a novel therapeutic approach for managing testicular TIR These findings support further investigation into nanocarrier-based delivery systems for natural compounds in reproductive medicine

Start PubMed Search

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MeSH Terms

- Rats
- Male
- Animals
- Antioxidants
- Rats, Wistar
- Hesperidin
- Spermatic Cord Torsion
- Tumor Suppressor Protein p53
- Flavonoids
- Reproductive Health
- Malondialdehyde
- Semen
- Seminiferous Tubules
- Oxidative Stress
- Spermatozoa
- Reproductive Medicine
- Apoptosis
- Gene Expression
- Reperfusion
- Ischemia
- Polymerase Chain Reaction

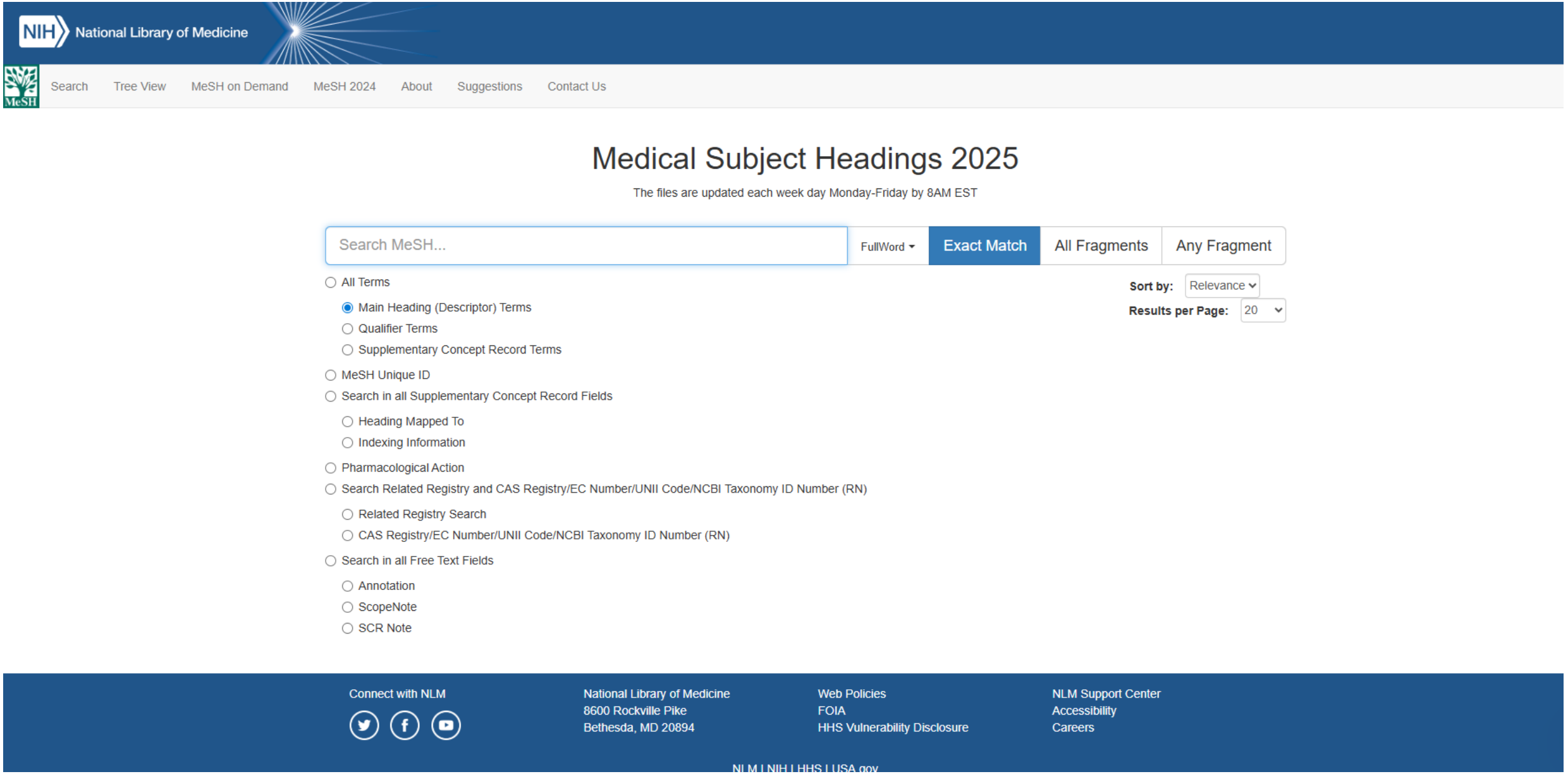
Additional Terms

- Humans

PubMed/MEDLINE Similar Articles

The following articles are 10 similar PubMed Related Citations that were also used in computing these MeSH recommendations. The order is from most to least relevant. Selecting any of the titles opens a new window or tab with that related citation in PubMed's Abstract view.

1. Hesperidin attenuated apoptotic-related genes in testicle of a male rat model of varicocoele. PMID:31325243
2. Protective effect of alpha glucosyl hesperidin (G-hesperidin) on chronic vanadium induced testicular toxicity and sperm nuclear DNA damage in male Sprague Dawley rats. PMID:24909458
3. Mechanism mediating the protective effect of diacerein in ischemia-reperfusion-induced testicular injury in rats. PMID:30076921
4. Protective effect of tadalafil and verapamil on testicular function and oxidative stress after torsion/detorsion in adult male rat. PMID:29917246
5. Protective effect of hesperidin against lung injury induced by intestinal ischemia/reperfusion in adult albino rats: histological, immunohistochemical and biochemical study. PMID:25063207
6. Investigating the sperm parameters, oxidative stress and histopathological effects of salvia miltiorrhiza hydroalcoholic extract in the prevention of testicular ischemia reperfusion damage in rats. PMID:31927420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INTRODUCTION

- Introduction of a research article makes the reader familiar with the subject of the article and the terms used in the research.
- It provides information about the background research studies and the existing gap in the scientific knowledge. It includes the reason for conducting the present work.
- It can include objectives, aims, research question, and research hypothesis.

- **Components of introduction**
- Background knowledge information is given to justify the reason for carrying out the present study. It includes the novelty of the study, limitations of prior studies, and what further information the present study is going to add to the existing knowledge.
- Write briefly about each point rather than describing or discussing. Since the article is targeted to a specific scientific community, addition of basic information should be avoided.
- Introduction should begin by broadly introducing the readers to the topic and should narrow down toward the end explaining the reason for conducting the research study. How to check the quality of introduction? It should answer two questions – “what is studied?” And “why is it studied?”

- **Structure of a Scientific Introduction (The "Funnel" Structure)**

1. Broad Background (What is the general problem?)

Start with a broad overview of the field to give context. Introduce the topic and explain its scientific or clinical importance.

Example:

Potassium channels play critical roles in immune cell function and have emerged as therapeutic targets in autoimmune and cancer therapy.

2. Known Information (What is already known?)

Summarize what is already established in the field. Mention key studies or accepted mechanisms. Be concise and accurate.

Kv1.3 is a voltage-gated potassium channel expressed in effector memory T cells, and its inhibition has been shown to suppress autoimmune responses in animal models.

3. Knowledge Gap (What is not known?)

Highlight the gap in the current knowledge. This is the rationale for your study —why it is needed.

Despite the identification of various Kv1.3 inhibitors, few have shown specificity or been tested in cancer-related models such as breast cancer cells.

4. Objective of the Study (What are you doing to fill the gap?)

Clearly state the aim(s) or hypothesis of your study. This should follow logically from the gap identified.

In this study, we evaluated a scorpion-derived peptide, MeuKTx, as a potential Kv1.3 blocker in breast cancer and inflammatory models.

- ◇ **Tips for Writing the Introduction**

✓Keep it focused: Avoid unnecessary detail.

✓Focus on what leads logically to your hypothesis.

✓Use citations selectively: Support statements with key references, but don’t overload with citations.

✓Transition smoothly: Move from general to specific naturally. Each paragraph should build on the previous one.

✓Avoid results: Don’t reveal your findings here — save that for the Results section.

- ◇ **Example Template (Fill-in-the-blanks)**

✓[Background][Topic] plays a vital role in [biological system or disease]. Recent studies have shown that [key known information].

✓[Current knowledge]Several approaches have been developed to [address the issue], including [methods or compounds]. However, [limitations or challenges] remain.

✓[Gap and justification]To date, [what is unknown or unclear], limiting the potential of [application or therapeutic strategy].

✓[Objective]In this study, we aimed to [main goal], by [brief method or strategy].

MATERIAL AND METHODS

- It is the evidence to how the work was done. It is a technical part of the research article.
- It is useful for other researchers to validate and carry out the same work with further dimensions. In this section, describe the methods in brief with sufficient details to observe the reproducibility of the experiments. If an already existing method is used, then provide reference for the same instead of describing it in details.
- It should include the relevant information such as place of study, participant selection criteria, exclusion criteria, study design, methods of analysis, statistical test, ethical approval, and so on.
- How to check quality of research study? It should answer the following questions – “Is it able to test the proposed hypothesis or answer the research question?” “Is it uniformly applicable to the participants?” And “Has it used the available resources minimally?”
- Sample size calculations should be included in material and methods.
- The reference parameter and reference study utilized for the sample size calculation need to be included.
- As per the study protocol, this section can contain questionnaires, intervention details, and clinical assessments. The information about the making of specific chemical and instrument, if required, can be included.

- **General Principles**

1. **Be Specific and Detailed**
   Include details like:
   1. **Source and purity** of reagents and materials
   2. **Model systems** used (cell lines, animals, tissues)
   3. **Equipment** and settings (e.g., RT-PCR machine, microscopy specs)
   4. **Exact concentrations, volumes, incubation times**

2. **Use Subheadings**
   Organize into logical sections to make it readable:
   1. Peptide synthesis
   2. Nanoparticle preparation
   3. Cell culture
   4. Animal model
   5. Assays (cytotoxicity, ELISA, qPCR, histology, etc.)

3. **Use Past Tense, Passive Voice (Often)**
   Example:
   Cells were seeded in 96-well plates at a density of 1 × 10^4 cells/well.

4. **Include Statistical Methods**
   Describe what software and tests you used for analysis.

- ◇ **Typical Structure (with Examples)**
- **1. Materials List**
- All chemicals, kits, antibodies, cell lines, etc., with supplier names and catalog numbers.

✓MeuKTx peptide was synthesized using solid-phase Fmoc chemistry (GenScript, USA). Chitosan (low molecular weight), sodium tripolyphosphate (TPP), and acetic acid were purchased from Sigma-Aldrich (USA).

- **2. Peptide/Nanoparticle Preparation** (if applicable)

✓Peptide SynthesisMeuKTx was synthesized and purified by HPLC to >95% purity.

✓The sequence was VGINVKCKHSGQCLKPCKDAGMRFGKCMNGKCDCTPK.

✓Nanoparticle Preparation

✓Chitosan nanoparticles were prepared using ionic gelation. Briefly, 2 mg/mL chitosan was dissolved in 1% acetic acid and stirred overnight. TPP (0.5 mg/mL) was added dropwise under magnetic stirring. MeuKTx was added during nanoparticle formation.

- **3. Cell Culture**

✓ MCF-7 and MCF-7/EMT cells were cultured in DMEM supplemented with 10% fetal bovine serum, 1% penicillin-streptomycin, and incubated at 37°C in a 5% CO_2 atmosphere.

- **4. Cytotoxicity Assay**

✓ Cell viability was assessed using the MTT assay. Cells were treated with free or nanoparticle-encapsulated MeuKTx at concentrations of 0–10 μM for 24 h. Absorbance was measured at 570 nm using a microplate reader (BioTek, USA).

- **5. Gene Expression (qPCR)**

✓ Total RNA was extracted using TRIzol reagent (Invitrogen), and cDNA was synthesized with the iScript™ kit (Bio-Rad). qPCR was performed using SYBR Green Master Mix (Thermo Fisher) and Kv1.3-specific primers. GAPDH was used as a housekeeping gene.

- **6. Animal Model (if used)**

✓ Neonatal Wistar rats (7 days old) received intra-articular injection of CFA to induce arthritis. Rats were treated with MeuKTx (free or in nanoparticles) or methotrexate via intraperitoneal injection for 14 days.

- **7. Histology and Immunohistochemistry**

✓ Joints were fixed in 10% formalin, decalcified, embedded in paraffin, and sectioned. H&E and Masson's trichrome stains were used.

✓ Inflammatory scores were evaluated blindly by a pathologist.

- **8. Statistical Analysis**

✓ Data are expressed as mean ± SD. Statistical significance was assessed using one-way ANOVA followed by Tukey's post hoc test in GraphPad Prism 9. A p-value < 0.05 was considered significant.

✓ ◇ **Final Tips**

❖ Avoid results or interpretation here — only describe what you did.

❖ Use standard terms and units (µL, °C, mg/mL).

❖ Mention controls clearly.

❖ Ensure ethical approvals (animal/human studies) are mentioned.

RESULTS

- This section gives the answer to the research question or hypothesis. It consists of the text explaining observations or findings of the study.
- It may be positive or negative finding.
- Organizing of result section is important. It should be disclosed in a meaningful sequential order from wider findings to the hypothesis acceptance or reflection.
- Summarize only the key findings of the study rather than elaborating findings irrelevant to the hypothesis or research question.
- It can be supported by a bar graph, flowchart, table, line graph, schematic drawing, or photographs for an effective visual illustration. For example, list of numerical data can be presented with table or list, and comparative numerical data can be represented by a bar graph.
- Do not repeat the data included in visual support, such as tables and figures. Rather than repeating to numerical data in text form, the interpretations should be included in the results with support of tables of the numerical data and bar diagrams. Do not over conclude the findings using vague terms.
- Do not compare the findings of your study with other studies in the result section – this can be included in the discussion section.
- Including negative findings are equally important as the positive results, though they are against the hypothesis of the study.

- **Visual support for text**

The scientific writing should be supported with the help of visual modes to make it more effective and to save the readers time. They are as follows:

- Table

It should be used to consolidate or summarize the data, to save the space, to show the correlation, and to avoid numerical overload on the result section. It may be of two types: (a) Word table that includes relationship, classification, and so on and (b) numerical table that summarizes complex quantitative data. The table should be organized logically. Keep the non-dependent variable in the rows and dependent variables in the column. Abbreviations can be used to save the space in the table but provide their expansions as foot note.

- Figures

These are provided for better explanations of the fact given in the text. The figure should provide evidence to the given facts. It should be self-explanatory and unambiguous. While using a patient's photograph, care should be taken to mask the identity of the individuals. File formats are very important in the submission of figures. Read carefully the required file format –.jpeg.,exif.,tiff.,gif.,png, and so on. Scaling of the image should be done carefully. Avoid distortion of the anatomical shape of the structures. Label the image whenever necessary.

- Graphs and charts

These are used to represent comparison of the data, trends, relationship, incidence, and so on. During preparation of graphical illustration, keep non-dependent variables along the x-axis and the dependent variables along the y-axis. Selection of various graph diaphragms is based on the data. For continuous data, use line graphs; for non-continuous data, use bar diagrams; for discrete variables, use bar or columns; for frequency of distribution, use scatter graph; and use pie graph for showing relationship of number of parts to the whole.

- ◇ **General Guidelines**
- **Use Past Tense**

✓Example: The peptide inhibited Kv1.3 expression in MCF-7/EMT cells.

- **Be Objective**

✓Don't interpret or explain why the results occurred — just state what you observed.

- **Use Subheadings for Each Major Experiment**

✓For example: Peptide characterizationNanoparticle characterizationCytotoxicity assayKv1.3 expression analysis Anti-angiogenesis assay

- **Use Figures and Tables**

✓Refer to them in the text: As shown in Figure 2A, Kv1.3 expression decreased after treatment...Each figure/table should be self-explanatory with a clear legend.

- ◇ **Example Structure**

✓1. Peptide and Nanoparticle Characterization

✓The synthetic peptide MeuKTx was confirmed by mass spectrometry (m/z = XXX Da) and HPLC purity (>95%). Chitosan nanoparticles had an average size of 145 ± 12 nm, zeta potential of +28 mV, and an encapsulation efficiency of 76%.

- **2. Cytotoxicity of Free and Encapsulated MeuKTx**

✓Treatment with free MeuKTx reduced cell viability in MCF-7/EMT cells in a dose-dependent manner (Figure 1A). Encapsulated MeuKTx showed enhanced cytotoxicity compared to the free form at 5 and 10 µM ($p < 0.01$). No significant toxicity was observed in normal HUVEC cells (Figure 1B).

- ◇ **Final Tips**

✓**Link findings to methods** clearly and in the same order.

✓**Avoid repeating data** already shown in figures/tables.

✓**Avoid interpretation** — save that for the Discussion.

DISCUSSION

- This section includes the main inference about the interpretation of the findings of research study. Already existing facts are utilized to justify the reasons behind the findings.
- It also includes agreements or disagreements with the findings of other researchers and the probable reasons for these arguments.
- It also includes the strength and limitations of the present study. It should convey the message about the benefits of the findings of the study and its utility in fulfilling the gap in the existing knowledge, and how it can change the life style of the society or existing scientific problem.
- Do not repeat the data from the result section. Avoid inclusion of only favorable supportive studies; include studies that do not agree with your findings and try to give probable reason for the same.
- Do not exaggerate the findings or utility of your study. Use past tense to describe your findings and past tense for referring prior studies.
- Add only scientific studies from the peer-reviewed indexed journal.
- Do not add the facts from non-scientific magazines. Discussion of negative findings is as important as the discussion about the positive findings.
- Avoid inclusion of huge numerical data in the discussion.
- Keep in mind that copied data come under plagiarism.

- ◇ **How to Structure the Discussion**

✓**1. Start with a brief summary of key findings**

✓Restate your main results without repeating the numbers.In this study, we demonstrated that the scorpion-derived peptide MeuKTx, particularly when encapsulated in chitosan nanoparticles, effectively inhibited Kv1.3 expression and suppressed malignant behaviors in breast cancer cells, as well as inflammatory responses in an arthritis model.

✓**2. Compare with previous studies**

✓Explain how your findings agree or disagree with other published work. Our findings are consistent with previous reports showing the therapeutic potential of Kv1.3 blockers in autoimmune diseases [Ref]. However, few studies have examined this channel’s role in cancer, especially breast cancer. Our data suggest that Kv1.3 is upregulated in MCF-7/EMT cells and may contribute to their invasive behavior.

- **3. Explain mechanisms and significance**

✓Interpret your results in light of biological mechanisms or clinical relevance.Kv1.3 regulates membrane potential and calcium signaling in immune and cancer cells. Its downregulation by MeuKTx may impair cell proliferation, migration, and cytokine release. The enhanced efficacy of the nanoparticle formulation likely reflects improved cellular uptake and sustained release.

- **4. Acknowledge limitations**

✓Be honest about what your study did not address. A limitation of our study is the lack of in vivo tumor models to validate the anti-cancer effect. In addition, the exact binding site of MeuKTx on Kv1.3 remains to be elucidated, which could guide future peptide optimization.

- **5. Suggest future directions**

✓Offer ideas for next steps in research.

✓Future studies should include in vivo cancer models, detailed electrophysiological analysis, and structural modeling of peptide–channel interactions to design more potent Kv1.3-targeting therapeutics.

- **6. Final statement or conclusion**

✓Close with the implication of your findings.

✓Overall, our results highlight MeuKTx as a promising dual-action therapeutic agent against cancer progression and inflammation, with enhanced delivery via chitosan nanoparticles. Kv1.3 may serve as a valuable therapeutic target in both oncology and immunology.

- ◇ **Final Tips**
- Avoid repeating all data — interpret, don’t summarize.
- Be honest but optimistic — highlight novelty and significance.
- Cite supporting studies to strengthen your interpretations.
- Keep it structured — avoid jumping between unrelated points.

CONCLUSION

- It can be added separately or can be added as a last concluding paragraph in the discussion.
- In conclusion, summarize the finding of the study in one or two lines.
- Do not exaggerate the findings and do not draw unjustified conclusions.
- Try to avoid mentioning the need for further studies requirements for finding the association of factors.
- Do not disclose your ongoing studies.
- Conclude the article with a logical statement.

❑ ◇ How to Write an Effective Conclusion

✓☑ What to include:

✓Main findings (briefly restated)

✓Implications or novelty

✓Potential applications

✓Suggestions for future research (optional)

❑ ◇ Final Tips

✓Avoid repeating all results — keep it high-level and concise

✓No new data or references

✓Focus on impact and next steps

Conclusion

Key Message

In conclusion, this research provides invaluable insights into the complex process of co-designing circular economy seafood products. The challenges catalogued across consumer perspectives, industry adoption barriers, and systemic constraints underscore the intricate balancing act involved in aligning sustainability innovations with existing sociotechnical regimes.

Key Research Findings

Key lessons from this research centre on four main themes. First, co-designing sustainable system changes demands negotiating between multiple dimensions – technical, cultural, economic, and regulatory. Second, bespoke co-design instruments can unlock situated insights and enable virtual co-creation. Third, design's integrative, human-centred, and facilitative approach offers vital capacities to synthesise multidimensional knowledge. Fourth, realising lasting transformations requires moving beyond discrete projects toward ongoing infrastructuring platforms.

Broader Implications

While this study focused narrowly on a seafood product, the insights extend more broadly to eco-innovation across food and other complex adaptive systems. As designers continue navigating this space, maintaining reflexive and pluralistic perspectives will be essential to avoid unintended harms from design colonialism.

Main Research Contribution

This research contributes both conceptual frameworks and practical tools to aid this necessary evolution.

Future Directions

But many open questions remain regarding how to equitably redistribute design power, build lasting engagements, and navigate unintended consequences. Further exploration into participatory platforms, toolkits, and mindsets is needed to clarify design's role in bridging diverse ways of knowing to co-create sustainable futures.

Call to Action

REFERENCES

- ✓Citation of existing knowledge is an important component of scientific writing.
- ✓Each journal follows its own writing style for references and citations.
- ✓Vancouver format of referencing is widely accepted. It is always advised to go through the instructions to author from journal's website as well as the recently published articles from the same journal.
- ✓Other reference stylings include Hayward referencing style, American Psychological Association System, the Chicago Manual of Style, and so on.

- ✓**Cite only the valid, relevant, and recent publications.**
- ✓Arrange the publications as suggested by the publishers or journals guidelines.
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- **Declaration of patient consent**

Patient’s consent not required as there are no patients in this study.

- **Financial support and sponsorship**

Nil.

- **Conflicts of interest**

There are no conflicts of interest.

CRediT authorship contribution statement

M.B: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing. **Z.E:** Conceptualization, Methodology, Resources, Writing - review & editing, Supervision. **A.A & S.M.G:** Conceptualization, Methodology, Formal analysis, Resources, Data curation, Writing - review & editing, Supervision, Project administration

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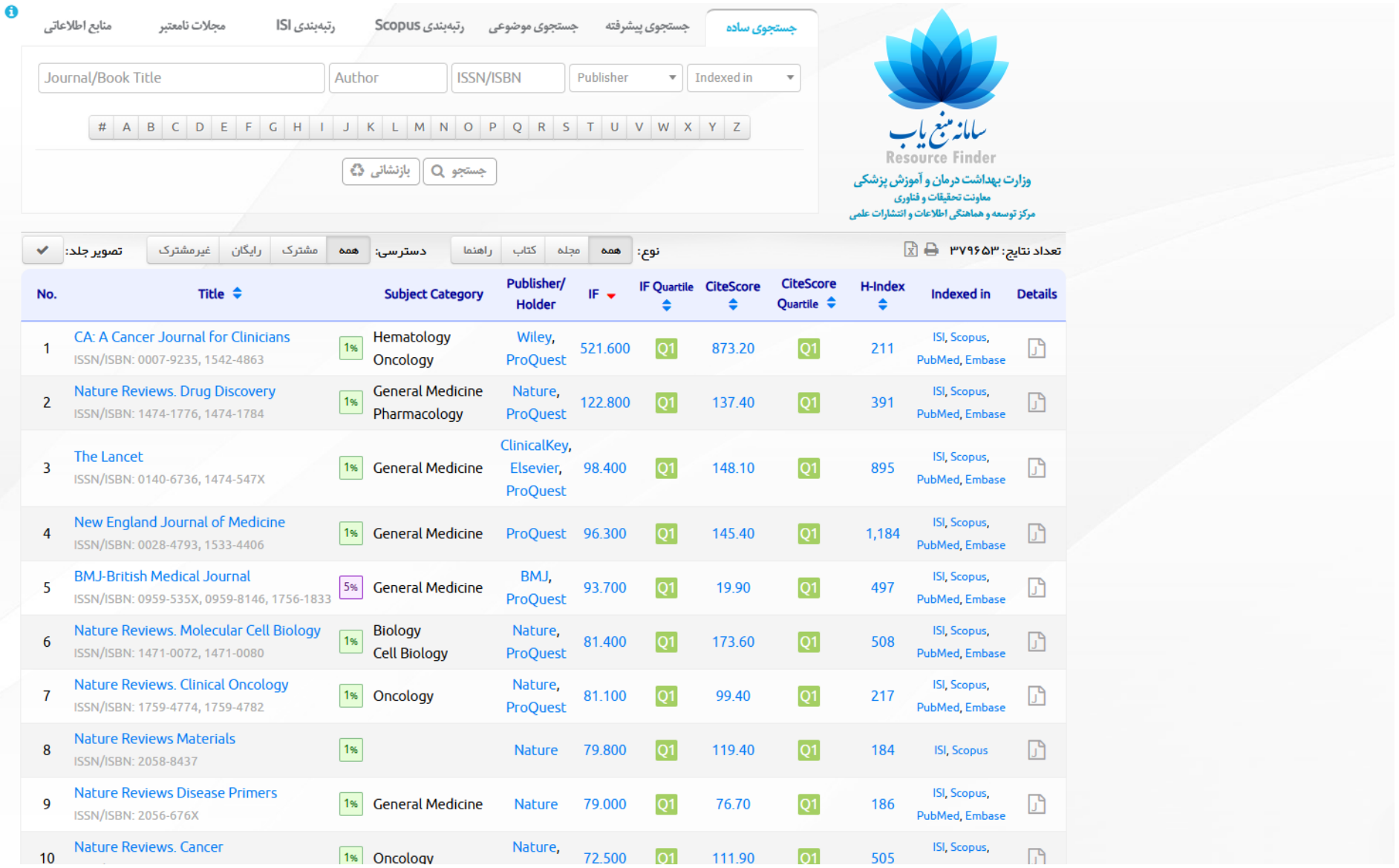
Conflict of interest

The authors declare no known competing financial interests or personal relationships.

Ethics approval

The experiments were approved by the Science and Research branch of the Islamic Azad University Ethics Committee (IR.IAU.SRB.REC.1403.352).



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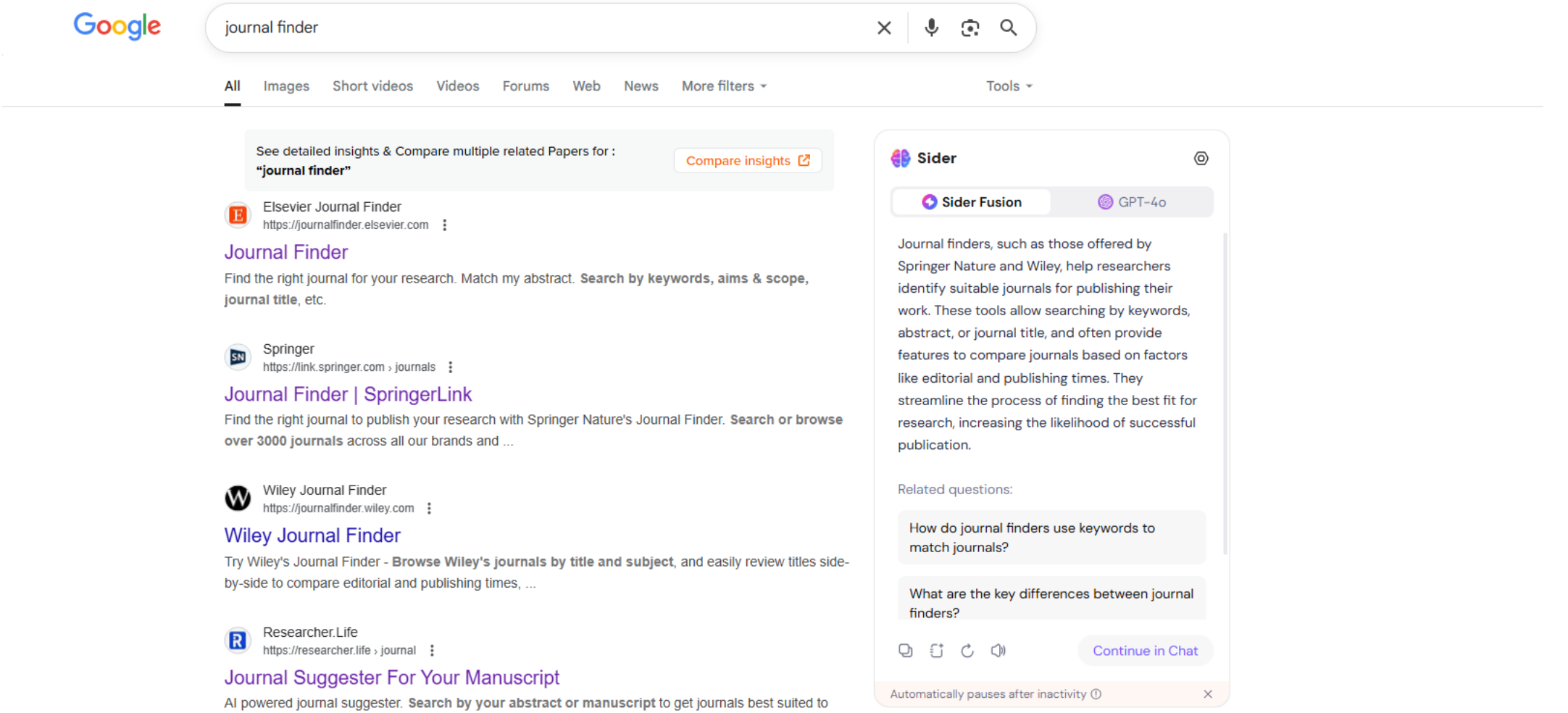
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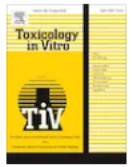

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The Autopsy of Rejected Papers

1. Title and Abstract: Avoid these traps
- ✗ Using vague or generic titles (e.g., "A Study of X")
- ✗ Exceeding the abstract word limit with fluff (150-250)
- ✗ Introducing references or citations in the abstract
- ✗ Writing the abstract before finalizing your results
- ✗ Failing to state the problem, method, and key finding clearly

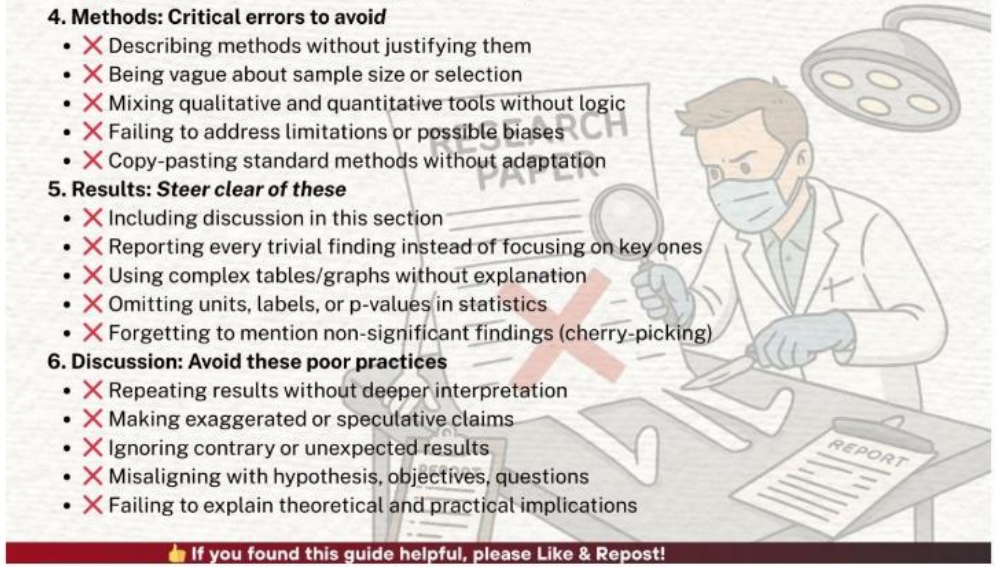
2. Introduction: Don't do this
- ✗ Start with overly broad generalizations.
- ✗ Forget to state a clear, specific research question
- ✗ Miss linking your study to a gap in the existing literature
- ✗ Overload with citations in the first paragraph
- ✗ Omit the study's contribution to theory or practice

3. Literature Review: Common pitfalls to avoid
- ✗ Turning the review into a list of summaries
- ✗ Over-citing outdated or low-quality sources
- ✗ Relying on secondary sources instead of originals
- ✗ Failing to identify debates, gaps, or contradictions
- ✗ Ignoring studies that challenge your assumptions

4. Methods: Critical errors to avoid
- ✗ Describing methods without justifying them
- ✗ Being vague about sample size or selection
- ✗ Mixing qualitative and quantitative tools without logic
- ✗ Failing to address limitations or possible biases
- ✗ Copy-pasting standard methods without adaptation

5. Results: *Steer clear of these*
- ✗ Including discussion in this section
- ✗ Reporting every trivial finding instead of focusing on key ones
- ✗ Using complex tables/graphs without explanation
- ✗ Omitting units, labels, or p-values in statistics
- ✗ Forgetting to mention non-significant findings (cherry-picking)

6. Discussion: Avoid these poor practices
- ✗ Repeating results without deeper interpretation
- ✗ Making exaggerated or speculative claims
- ✗ Ignoring contrary or unexpected results
- ✗ Misaligning with hypothesis, objectives, questions
- ✗ Failing to explain theoretical and practical implications



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