Systematic review

This record cannot be edited because it has been marked as out of scope

1. * Review title.

Give the title of the review in English

Meta-analysis of Vector-based Immunotherapy for Multi-Cancer

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

Meta-analysis of Vector-based Immunotherapy for Multi-Cancer

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

01/01/2023

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

26/11/2023

5. * Stage of review at time of this submission.

This field uses answers to initial screening questions. It cannot be edited until after registration.

Tick the boxes to show which review tasks have been started and which have been completed.

Update this field each time any amendments are made to a published record.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Xia Xue

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Dr Xue

7. * Named contact email.

Give the electronic email address of the named contact.

xue-xiasophia@hotmail.com

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

Henan Key Laboratory of Helicobacter pylori & Microbiota and Gastrointestinal Cancer, Marshall Medical Research Center, The Fifth Affiliated Hospital of Zhengzhou University, Zhengzhou, 450002, China

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

8617746969795

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Henan Key Laboratory of Helicobacter pylori & Microbiota and Gastrointestinal Cancer, Marshall Medical Research Center, The Fifth Affiliated Hospital of Zhengzhou University

Organisation web address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Weidong Wu. BGI College & Henan Institute of Medical and Pharmaceutical Sciences, Zhengzhou University
Bin Liu. Henan Key Laboratory of Helicobacter pylori & Microbiota and Gastrointestinal Cancer, Marshall Medical Research Center, The Fifth Affiliated Hospital of Zhengzhou University
Qing Zhang. Academy of medical science, Zhengzhou University
Jinxin Miao. Academy of Chinese Medicine Science, Henan University of Chinese Medicine
Xiaojuan Zhang. Scientific Research and Discipline Management Office, the Fifth Affiliated Hospital of Zhengzhou University
Xia Xue. Henan Key Laboratory of Helicobacter pylori & Microbiota and Gastrointestinal Cancer, Marshall Medical Research Center, The Fifth Affiliated Hospital of Zhengzhou University,
Pengya Feng. Department of Children Rehabilitation Medicine, Fifth Affiliated Hospital of Zhengzhou University

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

This work was supported by National Natural Science Foundation of China and Key Research and Development and Promotion Special Projects of Henan Province

Grant number(s)

State the funder, grant or award number and the date of award

National Natural Science Foundation of China (Grant No. 82207342)
Key Research and Development and Promotion Special Projects of Henan Province (No. 232102311068)

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person,**

unless you are amending a published record.

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

The PICO model was followed to guide our literature research in the subgroup analysis: population, intervention, comparator and outcomes. The population included vector-based Immunotherapy for Multi-Cancer. The intervention and outcomes are Country, Tumor type, and clinic phase. The included CRR(complete response rate), ORR(object response rat), and DR (dead rate)CY: (cytopenia), neutropenia (NE), anemia (AN), thrombocytopenia (TH), Grade 3 or higher cytokine release syndrome occurred (G3), and neurologic events occurred (NEU).

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

The studies were collected from PubMed (https://PubMed.ncbi.nlm.nih.gov/), CNKI (China National Knowledge, https://www.cnki.net/), and Wanfang database (https://www.wanfangdata.com.cn/) up to Sep 12 , 2023. The search term were “CAR-T”, “Vector”, and “Tumor”. (up to September 2023)

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

https://PubMed.ncbi.nlm.nih.gov/?term=CAR-T+Vector+and+Tumor

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Cancer is a multifactoral and complex disease that continues to be a life-threatening health challenge worldwide (Omotoso et al. 2023). Despite significant developments in revealing cancer biology and related

therapeutics, such as chemotherapy and radiation therapy, achieving long-term remission in different types of cancer remains elusive (Mellman et al. 2011). Cancer immunotherapy has recently emerged as a transformative approach that can enhance the human immune system to recognize and eliminate malignant cells ((Zhang & Zhang 2020). The vector-based immunotherapy (VBI) can be a promising tool in cancer immunotherapy due to its efficient delivery of therapeutic agents (Yang et al. 2022; Larocca & Schlom 2011). Vectors are derived from virus naturally or engineered to enhance the safety and efficiency of cancer immunotherapy (Bezeljak 2022; Larocca & Schlom 2011). VBI shows potential to bolster anti-tumor immune response against multiple cancers, moreover, it can be tailored to express a wide range of therapeutic payloads, including cytokines, antibodies, or immune checkpoint inhibitors, allowing for a multifaceted attack on tumor cells and the tumor microenvironment (Lao et al. 2022; Li et al. 2020). However, the studies of the interplay between VBI and treatment efficacy in different cancers remains limited.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

vector-based Immunotherapy for Multi-Cancer patients

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

American group, multiple myeloma, lymphoma, and leukemia cancer

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

China group, Solid cancer

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

single-arm study, prospective study, retrospective study and RCTs

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

The inclusion criteria were as follows: (1) Randomized controlled clinical trials (RCTs), single-arm clinical trial and retrospective study. (2) Diagnosis of malignant tumor, (3) Intervention of VBI or CAR-T therapy based on

VBI modification.The exclusion criteria were as follows: (1) benign tumor; (2) Untreated with vector-based immunotherapy; (3) Duplicate studies and incomplete/ inconsistent outcomes; (4) case reports, review, letter and, other unsuitable types

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

The main primary outcomes of complete response rate (CRR), object response rate (ORR), dead rate (DR)

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state ‘None’ or ‘Not applicable’ as appropriate to the review

CY: cytopenia; NE: neutropenia; AN: anemia; TH: thrombocytopenia; G3: Grade 3 or higher cytokine release syndrome occurred; NEU: neurologic events occurred.

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Two reviewers, QZ and XJZ, independently conducted literature searches and autonomously organized valuable clinical data. They utilized the revised version of MINORS (Methodological Index for Nonrandomized Studies) as their guide for assessing the quality of observational or non-randomized studies . In cases of inconsistencies between the aforementioned two reviewers, a third reviewer, JM, provided resolution.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

The revised version of MINORS was used for the quality assessment of observational or non-randomized studies.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

R (v4.3.0) was used to analyze the statistical data, and it was evaluated by relative risks, complete response rate (CRR), objective response rate (ORR)?and multiple adverse reactions with 95% confidence intervals. Random effects models were used to analyze the data with significant heterogeneity (I^2?50%) and for little heterogeneity ($I^2$50%), respectively. Publication bias was assessed by the funnel plots. R package meta(v6.5.0) is a user-friendly general package providing standard methods for meta-analysis. Survival (v3.5.5) and survminer (v0.4.9) were used to calculate survival analysis and visualize survival analysis results, respectively. CausalNex(v 0.12.1) is a Python library that uses Bayesian networks to combine machine learning and domain expertise for causal reasoning, which provides the ability to infer the structure from data.

29. * Analysis of subgroups or subsets.

State any planned investigation of ‘subgroups’. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

To provide a comprehensive understanding of VBI in contemporary cancer immunology, this meta-analysis aims to assess the collective outcomes of VBI across diverse cancer types?

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness

No

Diagnostic

No

Epidemiologic

No

Individual patient data (IPD) meta-analysis

No

Intervention

No

Living systematic review
No

Meta-analysis
Yes

Methodology
No

Narrative synthesis
No

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
Yes

Cardiovascular

No

Care of the elderly

No

Child health

No

Complementary therapies

No

COVID-19

No

Crime and justice

No

Dental

No

Digestive system

No

Ear, nose and throat

No

Education

No

Endocrine and metabolic disorders

No

Eye disorders

No

General interest

No

Genetics

No

Health inequalities/health equity

No

Infections and infestations

No

International development

No

Mental health and behavioural conditions

No

Musculoskeletal

No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
No

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents

No

Violence and abuse

No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

China

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

no

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

no

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

No

Give brief details of plans for communicating review findings.?

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Hematological malignancies, Clinical outcomes, Response rate, Different population, Immunotherapy, AVB

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.New registrations must be ongoing so this field is not editable for initial submission.

Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

No

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.