

# INPLASY

## Sulforaphane's Role in Osteosarcoma Treatment: A Systematic Review and Meta-Analysis

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### ADMINISTRATIVE INFORMATION

**Support** - This research received no external funding.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202530001

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 1 March 2025 and was last updated on 1 March 2025.

### INTRODUCTION

**Review question / Objective** What is the effectiveness of sulforaphane as a treatment for osteosarcoma.

**Rationale** Osteosarcoma is a common bone cancer, characterized by rapid progression and poor prognosis. Current treatment therapies for osteosarcoma remain relatively ineffective. Sulforaphane has been shown to have potent anticancer properties across different types of cancer. Therefore, the aim of this systematic review is to examine the potential role of sulforaphane in the treatment of osteosarcoma.

**Condition being studied** Osteosarcoma is the most common form of bone cancer in children and young adults. It can occur in any bone, but it primarily appears in the femur, the tibia and the humerus. Current treatment involves an initial neoadjuvant chemotherapy, followed by the surgical excision of the tumour, and lastly adjuvant chemotherapy for any remaining growths.

### METHODS

**Search strategy** Three databases were used to perform the search: Medline, EMBASE and Web of Science. Medical subject heading (MeSH) keywords and free words, were used to search each database for the concepts: "osteosarcoma" and "sulforaphane".

**Participant or population** Osteosarcoma patients, osteosarcoma cell lines and osteosarcoma mouse models.

**Intervention** Sulforaphane: 1-100uM for in vitro cultures and 5 - 10 mg/week for in vivo experiments.

**Comparator** Vehicle treated cultures and vehicle treated mice.

**Study designs to be included** Clinical and pre-clinical studies.

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**Eligibility criteria** Inclusion criteria: Studies evaluating the therapeutic efficacy of sulforaphane on osteosarcoma. Exclusion criteria: Studies examining the effects of other isothiocyanates, not sulforaphane.

**Information sources** Electronic databases: Medline, EMBASE and Web of Science.

**Main outcome(s)** Cancer-related outcomes, such as cell viability, cell migration, cell invasion, cell cycle distribution, apoptosis, antioxidant activity, colony formation, and tumour size in in vivo osteosarcoma models.

**Data management** Records will be kept in Mendeley and extracted data will be kept in excel.

**Quality assessment / Risk of bias analysis** The OHAT (Office of Health Assessment and Translation) risk of bias rating tool for in vitro studies and the Syrcle risk of bias tool for in vivo studies.

**Strategy of data synthesis** Narrative synthesis and quantitative synthesis (meta-analysis) using Review Manager, version 5.3.

**Subgroup analysis** Subgroup analysis will be performed if relevant.

**Sensitivity analysis** Sensitivity analysis will be performed if relevant.

**Language restriction** No.

**Country(ies) involved** Cyprus.

**Keywords** osteosarcoma; OSA; sulforaphane; SFN; systematic review; meta-analysis.

**Dissemination plans** Findings will be published.

#### **Contributions of each author**

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