IMMUNOTHERAPEUTIC EFFECTS OF MORUS RUBRA EXTRACT IN COLORECTAL CANCER INVESTIGATION OF EFFICACY IN VITRO

Rukiye Gürleyen[1], Ezgi Durmuş[2], Abdürrahim Koçyiğit[3]

[1]*Bezmialem Vakıf University School of Medicine, İstanbul, Turkey*

[2]*Department of Biochemistry, Bezmialem Vakif University School of Medicine, İstanbul, Turkey*

[3]*Department of Biochemistry, Bezmialem Vakif University, School of Medicine, İstanbul, Turkey*

March, 2024

BEZMIALEM VAKIF UNIVERSITY 1845

Review

Natural Products for the Prevention and Treatment of Hangover and Alcohol Use Disorder

Fang Wang [1], Ya Li [1], Yu-Jie Zhang [1], Yue Zhou [1], Sha Li [2] and Hua-Bin Li [1,*]

Received: 29 November 2015 ; Accepted: 31 December 2015 ; Published: 7 January 2016
Academic Editor: Derek J. McPhee

1 Guangdong Provincial Key Laboratory of Food, Nutrition and Health, School of Public Health, Sun Yat-Sen University, Guangzhou 510080, China; missingfeng@yeah.net (F.W.); saferide@126.com (Y.L.); zhyujie3@mail2.sysu.edu.cn (Y.-J.Z.); zhouyue3@mail2.sysu.edu.cn (Y.Z.)
2 School of Chinese Medicine, The University of Hong Kong, Hong Kong, China; lishasl0308@163.com
* Correspondence: lihuabin@mail.sysu.edu.cn; Tel.: +86-20-8733-2391

Abstract: Alcoholic beverages such as beer, wine and spirits are widely consumed around the world. However, alcoh
alcohol use disc
as hangover, liv
vegetables mig
treatment of th
provide an over
alcohol use diso
mechanism(s) o

Review

Dietary Natural Products for Prevention and Treatment of Liver Cancer

Yue Zhou [1], Ya Li [1], Tong Zhou [1], Jie Zheng [1], Sha Li [3] and Hua-Bin Li [1,2,*]

1 Guangdong Provincial Key Laboratory of Food, Nutrition and Health, School of P
Sun Yat-Sen University, Guangzhou 510080, China; zhouyuesysu@163.com (Y.Z.); zwky740359@163.com (T.Z.); zhengj37@mail2.sysu.edu.cn (J.Z.)
2 South China Sea Bioresource Exploitation and Utilization Collaborative Innovatio
Sun Yat-Sen University, Guangzhou 510006, China
3 School of Chinese Medicine, The University of Hong Kong, Hong Kong, China; lis
* Correspondence: lihuabin@mail.sysu.edu.cn; Tel.: +86-20-873-323-91

Received: 11 January 2016; Accepted: 1 March 2016; Published: 10 March 2016

Abstract: Liver cancer is the most common malignancy of the digestive sy
rate. Accumulating evidences suggests that many dietary natural products
for prevention and treatment of liver cancer, such as grapes, black currant,
cruciferous vegetables, French beans, tomatoes, asparagus, garlic, turmeric, gin
some edible macro-fungi. These dietary natural products and their active comp
development and progression of liver cancer in various ways, such as inhibit
and metastasis, protecting against liver carcinogens, immunomodulating an
chemotherapeutic drugs. This review summarizes the potential prevention and
dietary natural products and their major bioactive constituents on liver cancer,
mechanisms of action.

Keywords: liver cancer; fruit; vegetable; spice; anticancer

Morus alba (mulberry), a natural potent compound in management of obesity

Mohaddese Mahboubi

Show more

+ Add to Mendeley Share Cite

https://doi.org/10.1016/j.phrs.2019.104341 Get rights and content

The American Journal of Chinese Medicine | Vol. 51, No. 07, pp. 1711-1749 (2023) No Access

Effects and Mechanistic Role of Mulberry Leaves in Treating Diabetes and its Complications

Yanjiao Zhang, Runyu Miao, Kaile Ma, Yuxin Zhang, Xinyi Fang, Jiahua Wei, Ruiyang Yin, Jingxue Zhao, and Jiaxing Tian

https://doi.org/10.1142/S0192415X23500775 | **Cited by:** 0 **(Source: Crossref)**

< Previous Next >

View Article Tools Share Recommend To Library

Abstract

Diabetes mellitus (DM) has become a surge burden worldwide owing to its high prevalence and range of associated complications such as coronary artery disease, blindness, stroke, and renal failure. Accordingly, the treatment and management of DM have become a research hotspot. Mulberry leaves (*Morus alba* L.) have been used in Traditional Chinese Medicine for a long time, with the first record of its use published in Shennong Bencao Jing (Shennong's Classic of Materia Medica). Mulberry leaves (MLs) are considered highly valuable medicinal food homologs that contain polysaccharides, flavonoids, alkaloids, and other bioactive substances. Modern pharmacological studies have shown that MLs have multiple bioactive effects, including hypolipidemic, hypoglycemic, antioxidation, and anti-inflammatory properties, with the ability to protect islet β-cells, alleviate insulin resistance, and regulate intestinal flora. However, the pharmacological mechanisms of MLs in DM have not been fully elucidated. In this review, we summarize the botanical characterization, traditional use, chemical constituents, pharmacokinetics, and toxicology of MLs, and highlight the mechanisms involved in treating DM and its complications. This review can provide a valuable reference

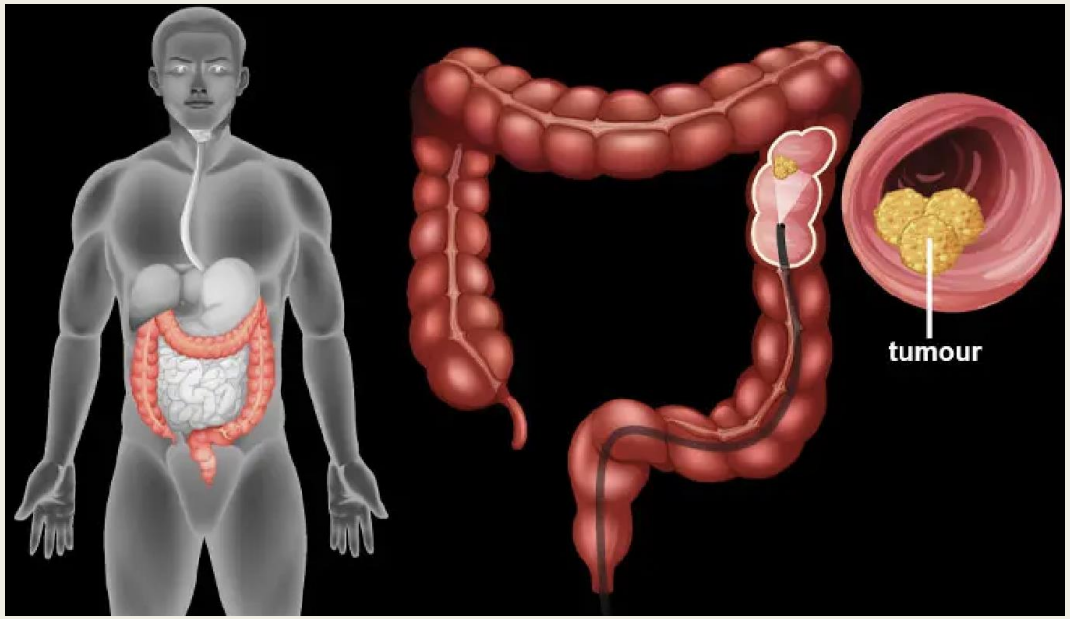
MORUS RUBRA

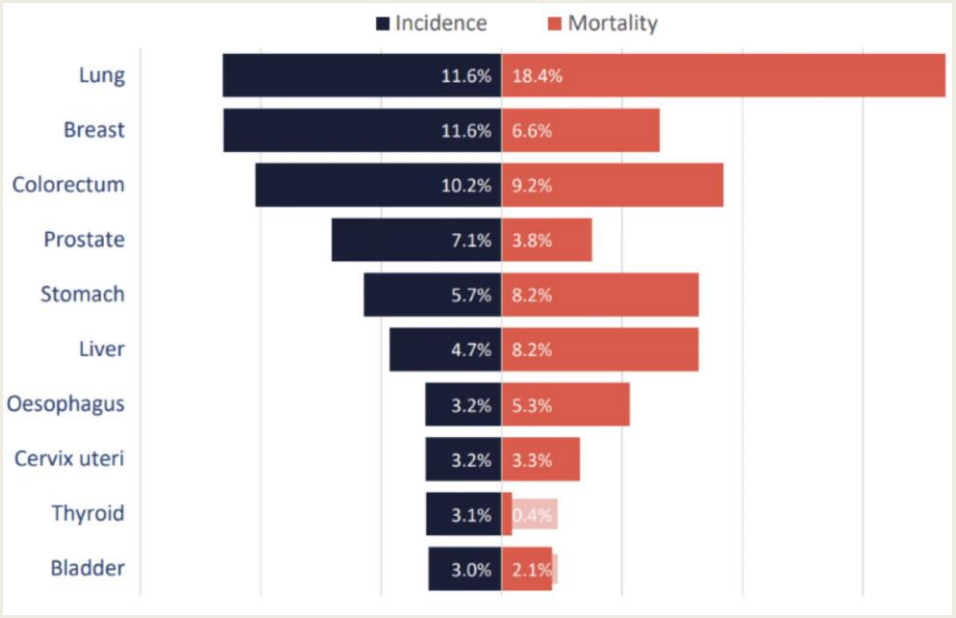
→ protective agent against diabetic complications (1)

→ anti-viral properties (2)

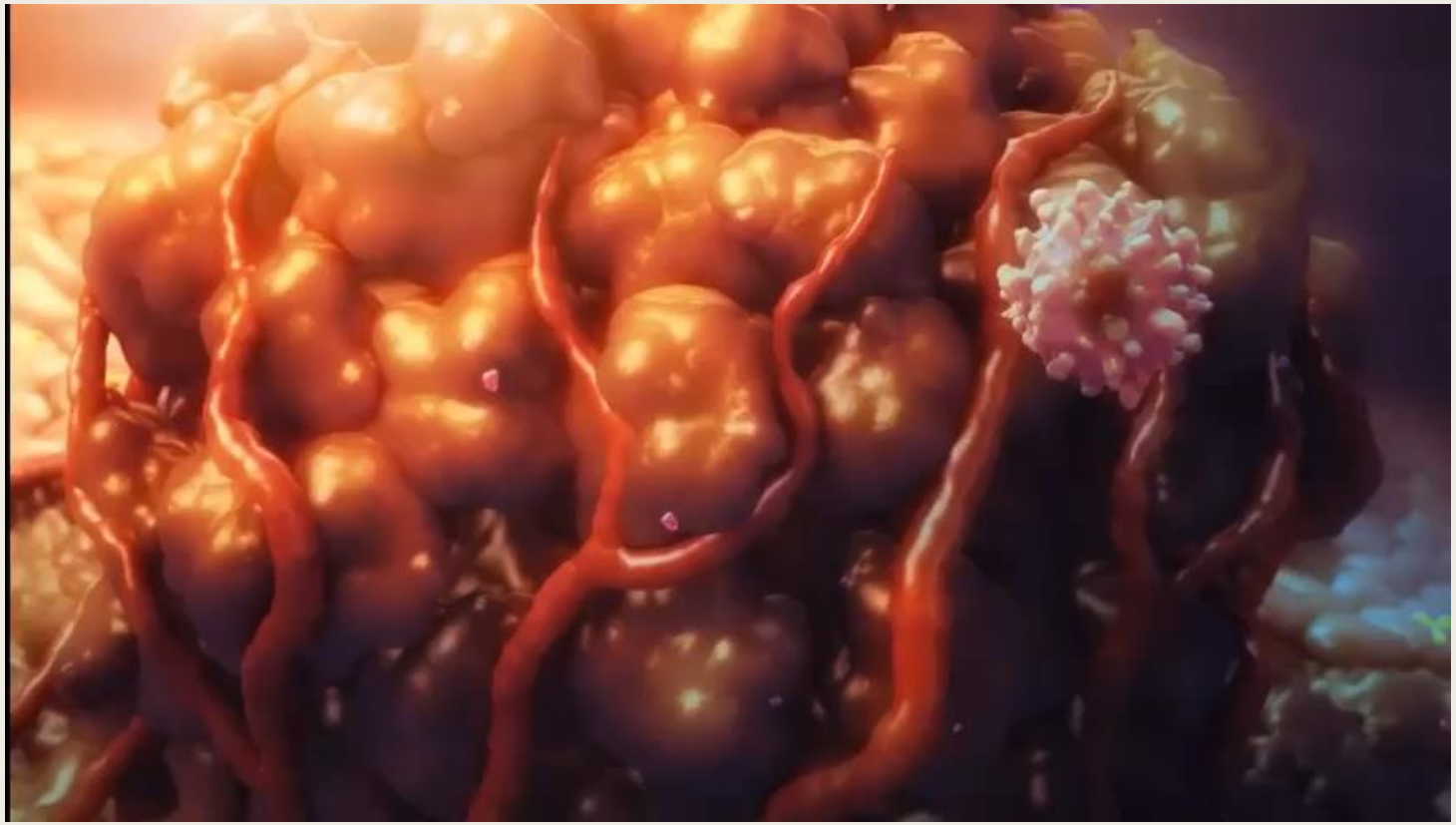
→ anti-atherosclerotic activity (3)

BEZMIALEM VAKIF UNIVERSITY 1845



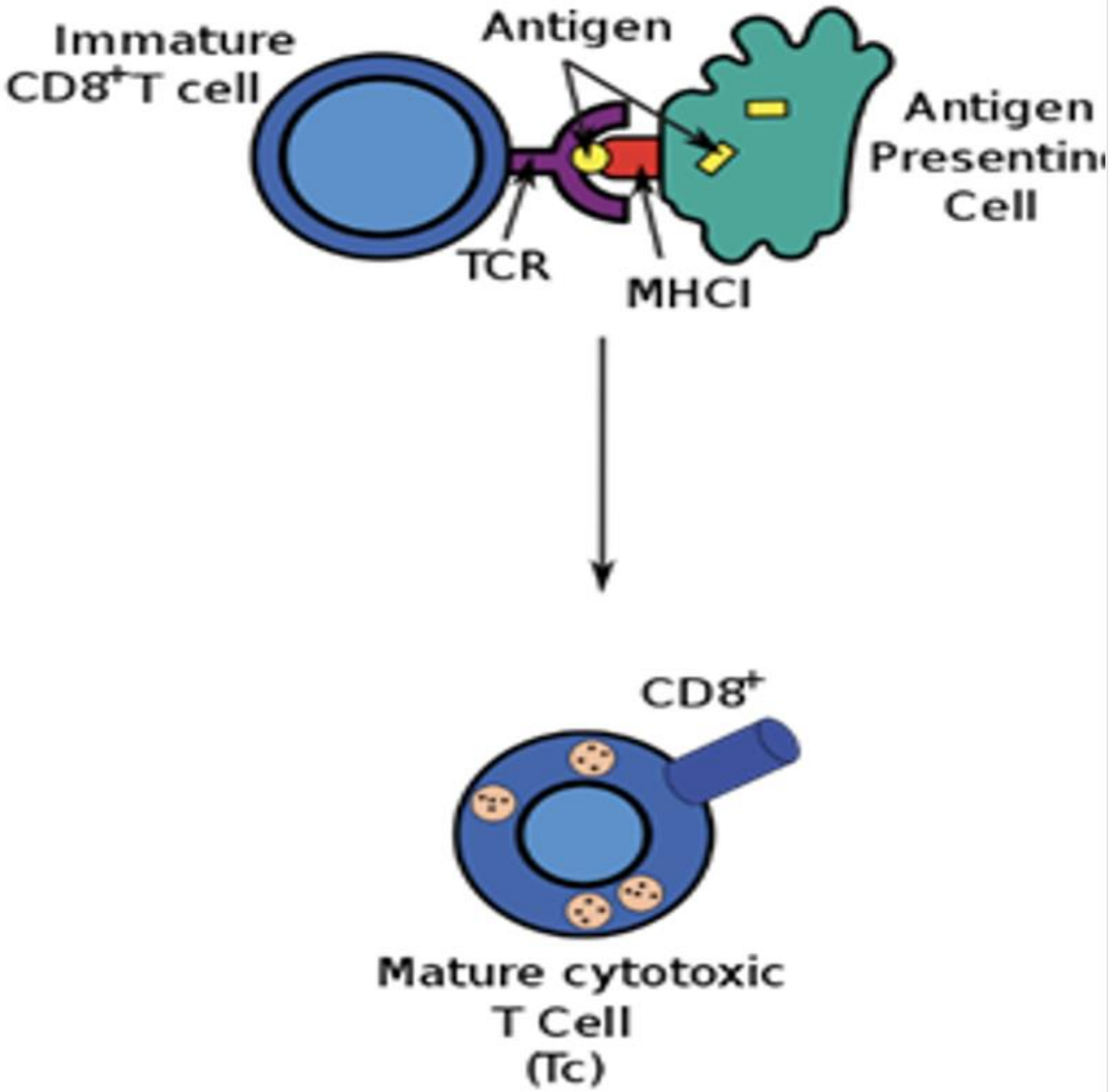


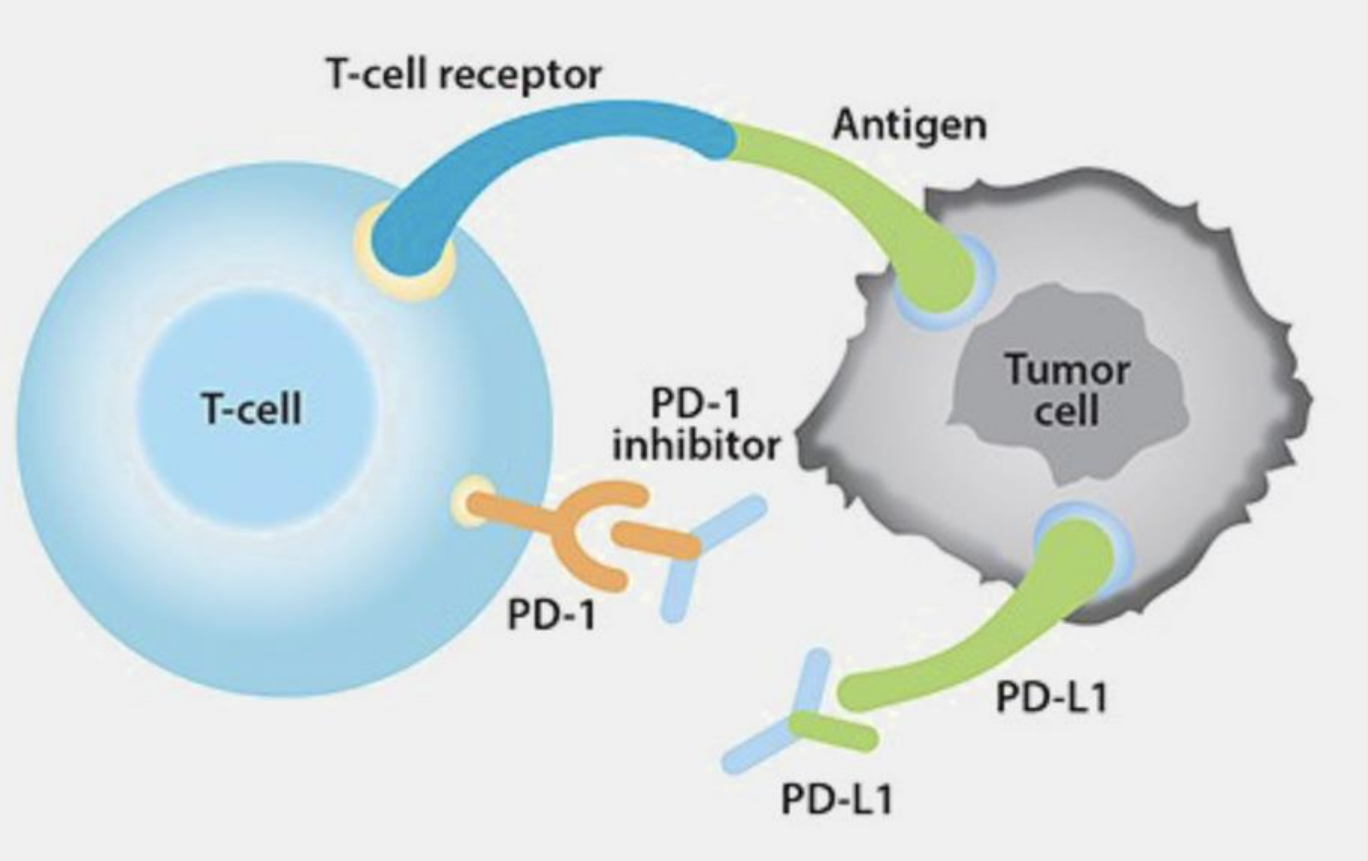
- → Ranking third in terms of global incidence
- → The limited effectiveness and side effects of surgical methods and chemotherapeutic drugs



Immune system and Cancer

BEZMIALEM VAKIF UNIVERSITY 1845


Immature
CD8+T cell
Antigen
Antigen
Presentin
Cell
TCR
MHCI
CD8+
Mature cytotoxic
T Cell
(Tc)



- PD-L1 functions as a 'stop sign’
- PD-L1 works by binding to PD-1 receptors on T cells

BEZMIALEM
VAKIF UNIVERSITY
1845

AIM

We aimed to demonstrate the cytotoxic effect of purple mulberry extract on HT-29 colon cancer cells and investigate how Jurkat T cells alter their cytotoxic response against these cells.

MATERIAL & METHODS

1-Purple Mulberry Extraction

2-Determination of Total Phenolic Content

3-Determination of Total Flavonoid Content

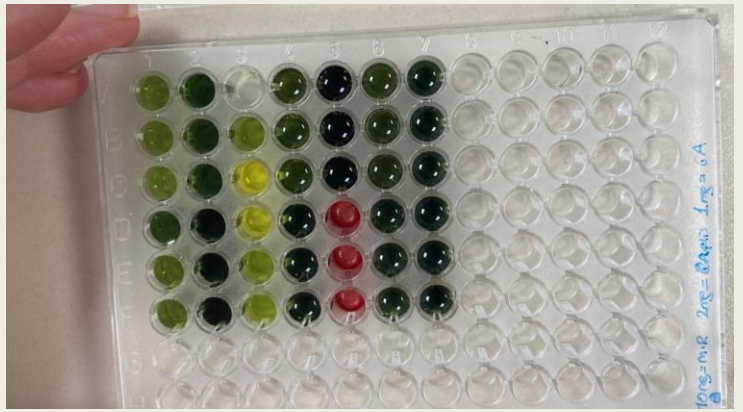
4-Determination of Total Antioxidant Activity

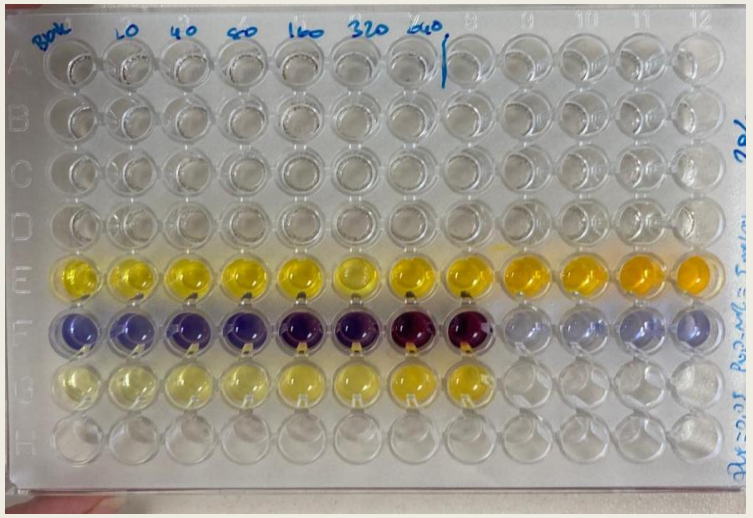
5-Determination of PD-1 Protein Levels → Western Blot Analysis

6-Evaluation of the Activity of Jurkat T Cells Induced with CD28 and CD3 Antibodies → ELISA Method

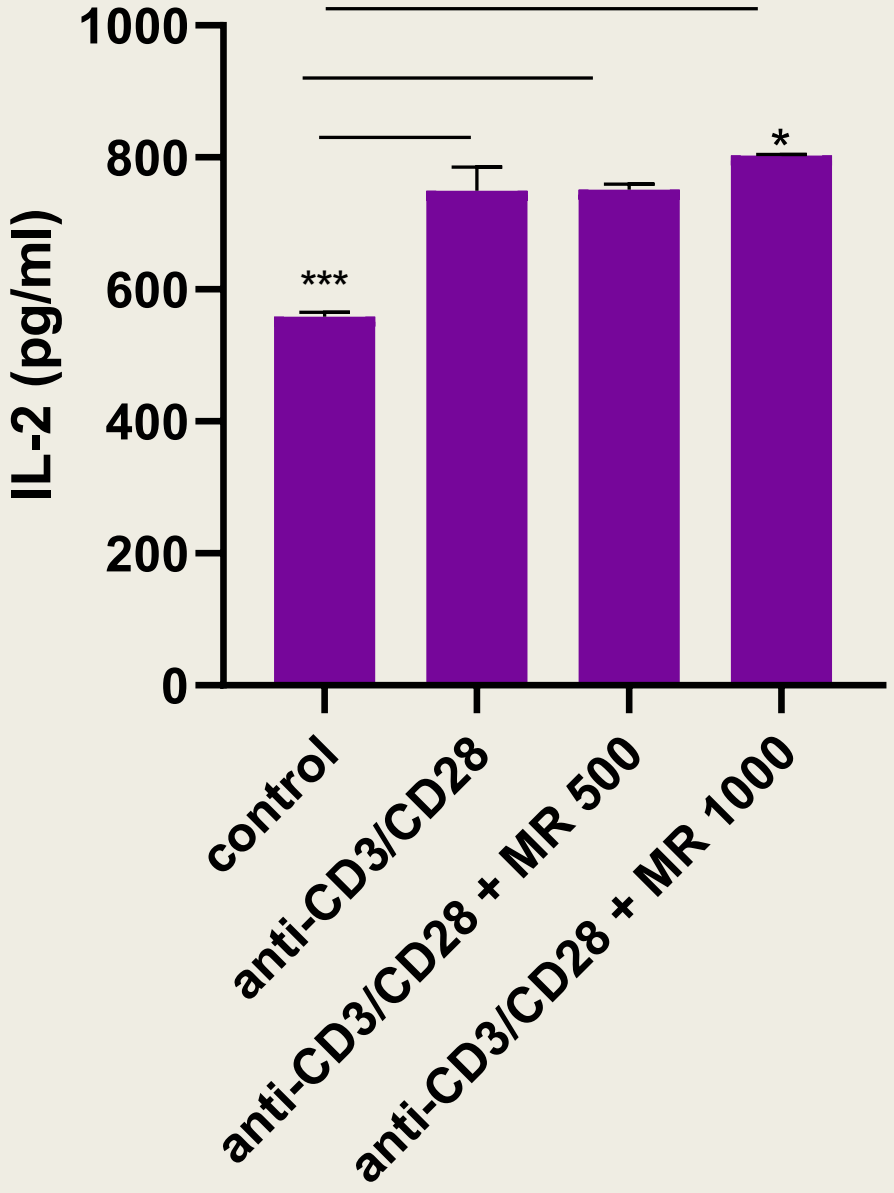
RESULTS

	Total Phenolic Content (mg gallic acid Eq/g)	Total Flavonoid Content (mg quercetin Eq/g)	Anti-oxidant Activity (ABTS inhibition (%)) (mg/L)
Morus Rubra %80 Ethanol Extract	315± 4,97	163,96±1,63	58.42 ± 0.10





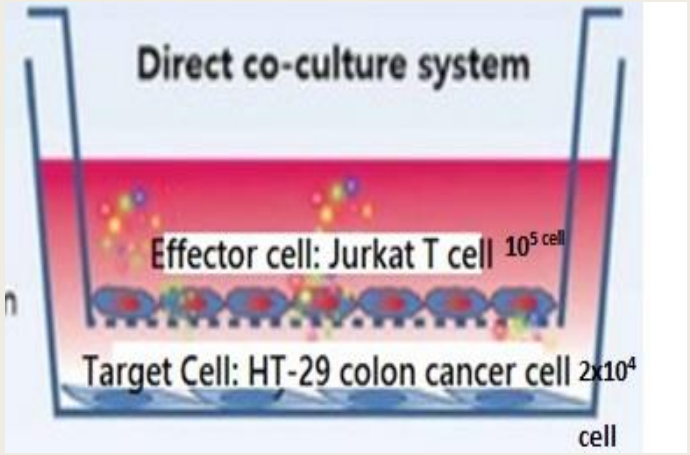
BEZMIALEM VAKIF UNIVERSITY 1845

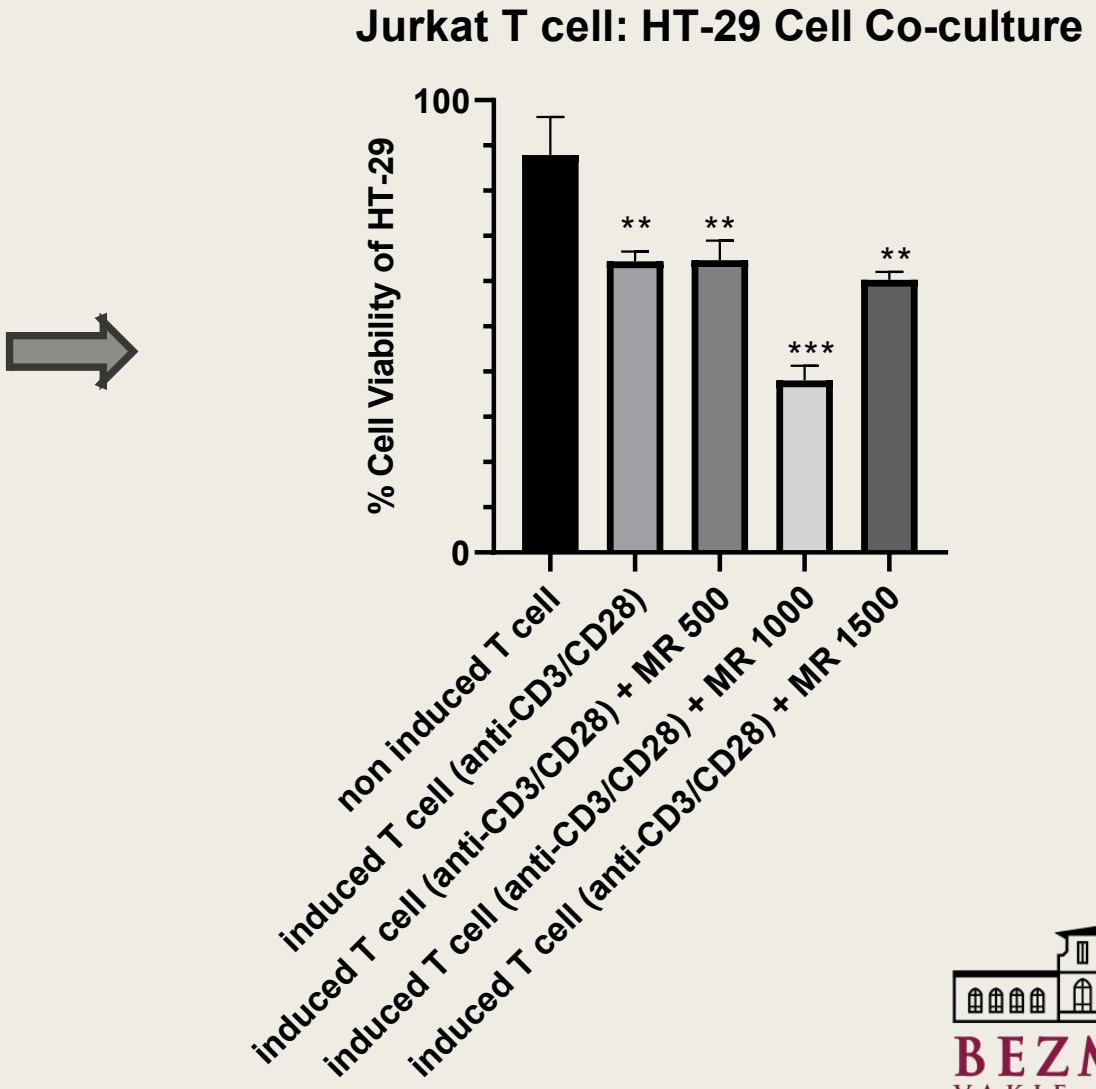


The Impact of Morus Rubra on Jurkat T Cell Activity

BEZMIALEM VAKIF UNIVERSITY 1845

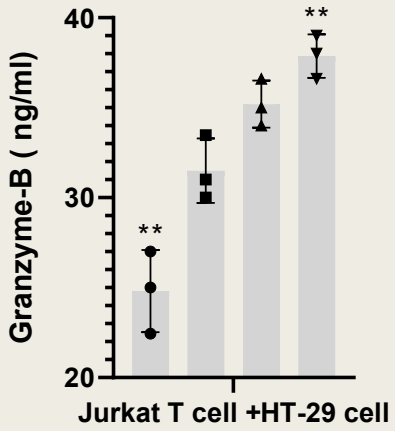
The Effect of Morus Rubra Extract on HT-29 Colon Cancer Cell Death through Jurkat T Cells



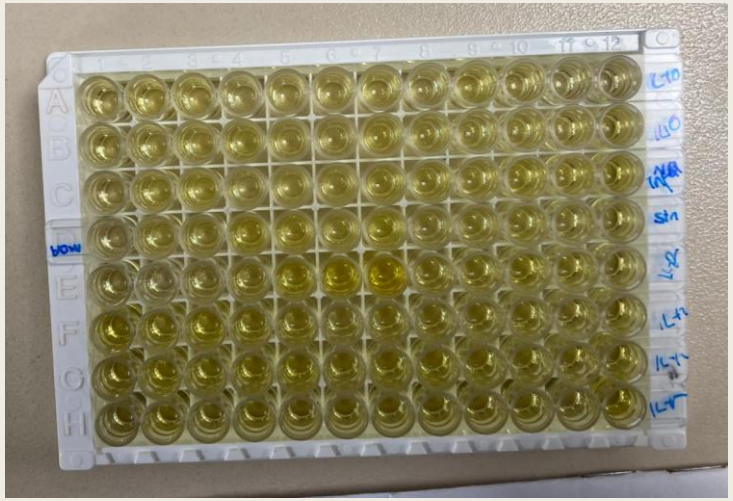


BEZMIALEM VAKIF UNIVERSITY 1845

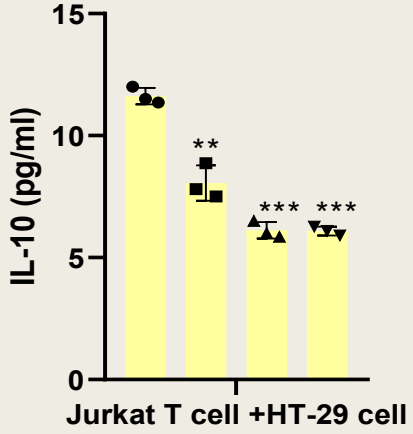
Jurkat T cell and HT-29 co-culture supernatants



- non-stimulated T cell
- stimuated T cell with antiCD3/CD28
- stimulated T cell with antiCD3/CD28 and MR500
- stimulated T cell with antiCD3/CD28 and MR1000

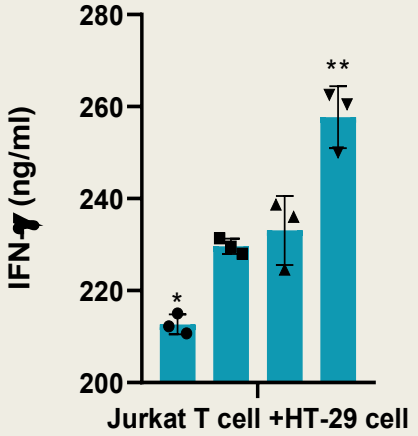


Jurkat T cell and HT-29 co-culture supernatants



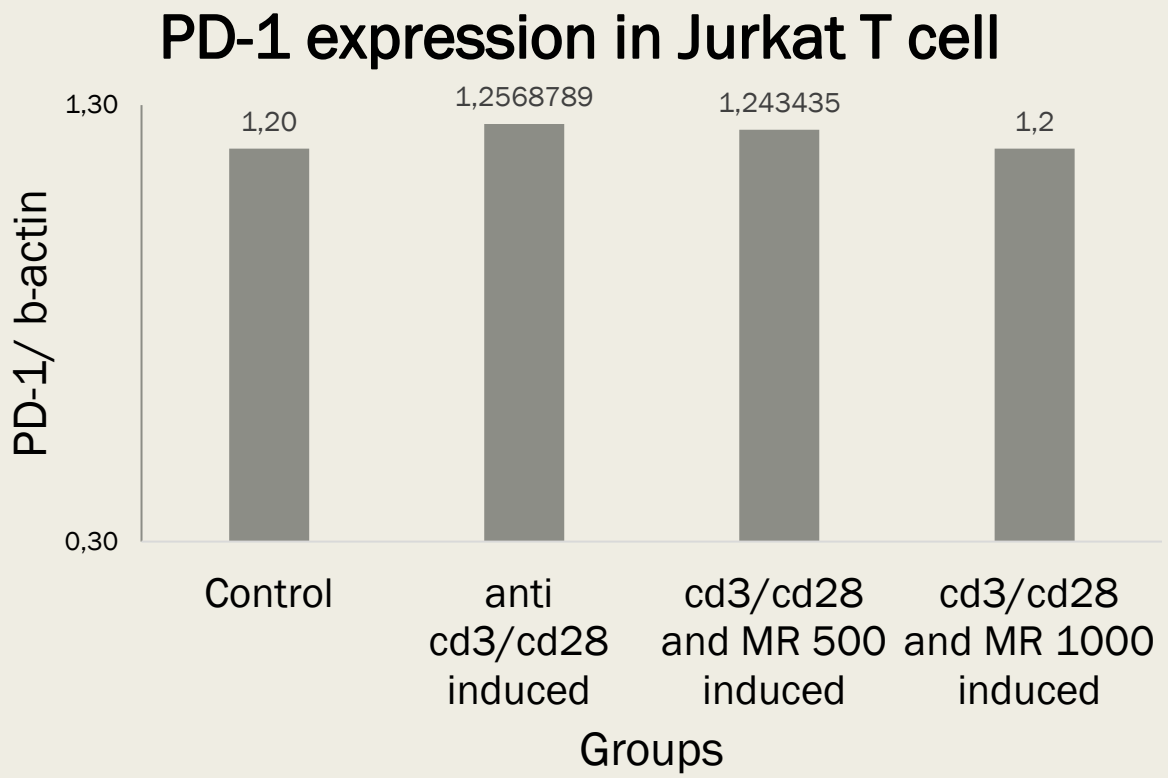
- non-stimulated T cell
- stimuated T cell with antiCD3/CD28
- stimulated T cell with antiCD3/CD28 and MR500
- stimulated T cell with antiCD3/CD28 and MR1000

Jurkat T cell and HT-29 co-culture supernatants



- non-stimulated T cell
- stimuated T cell with antiCD3/CD28
- stimulated T cell with antiCD3/CD28 and MR500
- stimulated T cell with antiCD3/CD28 and MR1000

The Impact of Morus Rubra on PD-1 Levels in Jurkat T Cells



There was no significant difference observed between the groups in the results. This indicates that the 24-hour application of Morus Rubra extract has no effect on this protein (PD-1).

BEZMIALEM VAKIF UNIVERSITY 1845

CONCLUSION

1-Morus Rubra has enhanced the anti-tumoral response against the HT-29 colon cancer cell line.

2-It has modulated cytokine levels in co-culture models.

3-It did not cause a significant change in PD-1 protein expression levels.

DISCUSSION
LIMITATIONS & STRENGTH

- The mechanism of action studies of Morus Rubra should be advanced.
- In addition to in vitro studies, in vivo studies should also be conducted.

BEZMIALEM VAKIF UNIVERSITY 1845

REFERENCES

1. *Cullen, J. M., & Breen, M. (2016). An Overview of Molecular Cancer Pathogenesis, Prognosis, and Diagnosis. Tumors in Domestic Animals, 1–26. doi:10.1002/9781119181200.ch1*
2. *Zugazagoitia, J., Guedes, C., Ponce, S., Ferrer, I., Molina-Pinelo, S., & Paz-Ares, L. (2016). Current Challenges in Cancer Treatment. Clinical therapeutics, 38(7), 1551–1566. https://doi.org/10.1016/j.clinthera.2016.03.026*
3. *Xi, Y., & Xu, P. (2021). Global colorectal cancer burden in 2020 and projections to 2040. Translational oncology, 14(10), 101174. https://doi.org/10.1016/j.tranon.2021.101174*
4. *Füchsl, F., & Krackhardt, A. M. (2022). Paving the Way to Solid Tumors: Challenges and Strategies for Adoptively Transferred Transgenic T Cells in the Tumor Microenvironment. Cancers, 14(17), 4192. https://doi.org/10.3390/cancers14174192*
5. *Robert, C. A decade of immune-checkpoint inhibitors in cancer therapy. Nat Commun 11, 3801 (2020). https://doi.org/10.1038/s41467-020-17670-y*
6. *Yang, H., Wang, L., & Zhang, J. (2022). Leukocyte modulation by natural products from herbal medicines and potential as cancer immunotherapy. Journal of leukocyte biology, 112(1), 185–200. https://doi.org/10.1002/JLB.3RU0222-087RRR*
7. *Cosme, F., Pinto, T., Aires, A., Morais, M. C., Bacelar, E., Anjos, R., Ferreira-Cardoso, J., Oliveira, I., Vilela, A., & Gonçalves, B. (2022). Red Fruits Composition and Their Health Benefits-A Review. Foods (Basel, Switzerland), 11(5), 644. https://doi.org/10.3390/foods11050644*

BEZMIALEM VAKIF UNIVERSITY 1845


SafeFAST Classic

THANK YOU FOR LISTENING…