Hi-Q
Marine Biotech

Clinical Applications of **Oligo Fucoidan** in Translational Medicine for Adjuvant Cancer Therapy

Making Difference in Cancer with Clinically Tested Adjunct Supplement

OliFuco® Oligo Fucoidan
Doctor's Recommended Fucoidan
Health Ingredients Verified with Human Clinical Trials

OliFuco® Oligo Fucoidan

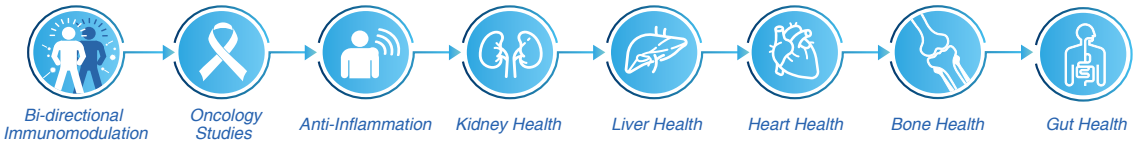
Hi-Q

Health Ingredients Verified with Human Clinical Trials

- 2022 Taiwan BIO Awards
- 2022 Malaysia Technology Expo Gold Award
- 2022 The Third AII American DAVINCI International Innovation Gold Award

PATENTED

Fucoidan is a kind of polysaccharide substance which mainly exists in the brown seaweed. Hi-Q Marine Biotech has developed OLIFUCO® Oligo Fucoidan by the advanced hydrolysis technology to extract the bioactive Low Molecular Weight Fucoidan (Oligo Fucoidan, 500-1500 Daltons) from natural oceanic brown seaweed. Oligo Fucoidan is verified by scientific studies and human clinical trials with multi-health benefits. Hi-Q Oligo Fucoidan has various pharmacological and biological activities, such as anti-cancer, anti-inflammatory, and immunomodulatory functions. In addition, it is proven to protect against or reduce toxicity from chemotherapeutic agents and radiation for cancer treatments. Oligo Fucoidan has been recently marketed as a dietary supplement or nutraceutical for various diseases, including cancer.



Making Difference in Cancer with Clinically Tested Adjunct Supplement

With the passion of empowering people to lead healthier lives, Hi-Q has been investing in R&D and product development of Oligo Fucoidan in dietary health supplement as adjunct supplement to cancer patients to relieve the side effects from cachexia. Hi-Q has joined collaboration with PhD scientists and medical doctors in leading research institutions, universities hospitals for continue Oligo Fucoidan scientific studies and human clinical trials.

Hi-Q Oligo Fucoidan, the health ingredient is marketed under the tradename OLIFUCO®. Hi-Q has its own branded (Hi-Q® Health, FucoHiQ®) dietary supplements the products are researched and developed by using this scientific, clinically proven ingredient. Hi-Q is a leading fucoidan company and has 13 years of successful sales history in Taiwan since 2009. Hi-Q' s Oligo Fucoidan products are recommended by medical doctors and pharmacists.

Anti-Cancer Effects of Fucoidan Combinations As An Adjuvant

Several studies have reported that fucoidan and its combinations can induce apoptosis in a variety of cancers. Studies of fucoidan and combinations of fucoidan with clinical drugs in adjuvant settings have suggested that fucoidan may reduce the toxicity of certain anti-cancer drugs. These studies suggest that fucoidan could be used in adjuvant settings for cancer management. Synergistic effects of fucoidan with clinically used drugs in the inhibition of various tumors and/or cancers in mice have been reported. Synthetic drugs used as chemotherapeutics agents are frequently limited by their side effects and drug resistance. Fucoidan has been investigated as a dietary supplement or synergetic anti-tumor agent to reduce the toxicity and/or enhance the efficacy of chemotherapeutic.

Positive synergistic cytotoxic effects of fucoidan combined with cisplatin on both LLC1 mouse lung carcinoma cells and mice have been reported. A role of the Smurf2-dependent ubiquitin–proteasome pathway in TGF receptor degradation has been proposed. Fucoidan upregulates TLR4/CHOP-mediated caspase-3 and PARP activation and enhances cisplatin-induced cytotoxicity in human lung cancer cells. Moreover, in human clinical studies, combined cisplatin and fucoidan treatment effectively increased the survival rate of patients with lung cancer in Taiwan. The results indicated that fucoidan exerts a greater anti-tumorigenic effect as an adjuvant, second-line anti-cancer diet supplement and may also regulate immune functions, while cisplatin remains a first-line anti-cancer drug for chemotherapy in clinical human lung cancer treatment.

Clinical Applications of Oligo Fucoidan in Translational Medicine for Adjuvant Cancer Therapy

- Immune-modulatory effects
- Enhance proliferation of natural killer (NKs) cells and cytotoxic T cells (CTLs)
- Inhibit proliferation/metastasis of cancer cell
- Inhibit angiogenesis of cancer
- Induce apoptosis of cancer cell
- Prevent tumor progression, alter tumor microenvironment (TME)
- Improve outcome of chemotherapy & radiotherapy
- Reduce side effects of chemotherapy & radiotherapy
- Reduce radiation-induced fibrosis
- Improve cancer cachexia
- Improve diseases control rate (DCR), be used as adjunct therapy supplement alongside conventional oncology treatments

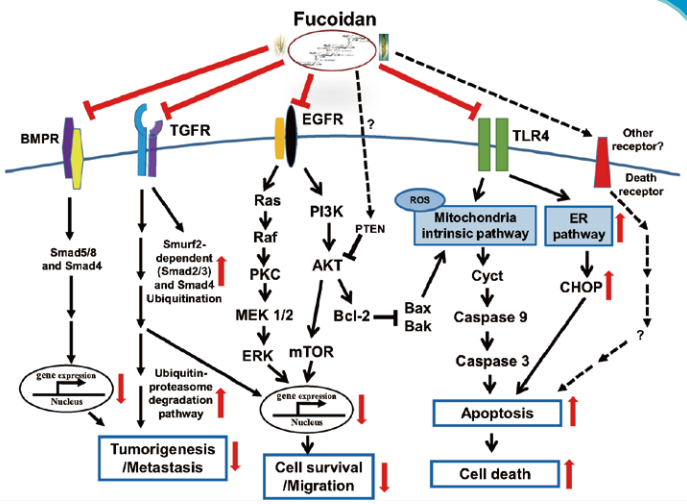


Fig. Fucoidan interacts receptors-mediated anticancer pathways and reactions

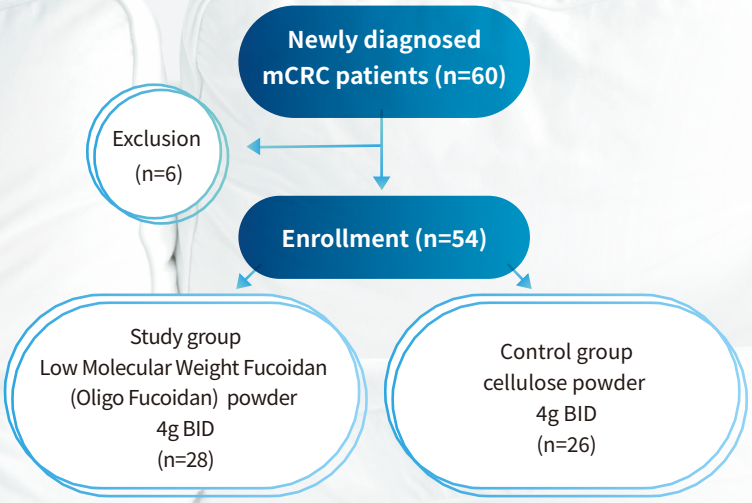
The scientific studies result show that Oligo fucoidan, whether through in vitro to in vivo research studies or clinical trials in humans, has been proven to produce positive bioactive and synergy effects of adjuvant therapy on cancer treatment. This allows molecular mechanisms in cancer research to be applied in adjuvant cancer treatment, in line with the pursuit of translational medicine and the mindset of establishing a direct link between basic medical research and clinical application. Oligo Fucoidan also has attained its inclusion in the Dictionary of Drugs of the U.S. National Cancer Institute (NCI) (Code C170752).

More about Hi-Q' s research articles

Disease Control Rate Improvements with Oligo Fucoidan Supplemental Therapy

Improved Disease Control Rate Up to 92.8% Metastatic Colorectal Cancer Patients

Double-Blind Randomized, Placebo-Controlled Clinical Trial
Kaohsiung Medical University Hospital (Taiwan)



In 2017, Hi-Q cooperated with medical expert team from Kaohsiung Medical University Hospital and performed the first prospective, randomized, double-blind, controlled trial to investigate the efficacy of Low Molecular Weight Fucoidan (Oligo Fucoidan) as a supplemental therapy to chemotarget agents in patients with metastatic colorectal cancer (mCRC). The results indicated that Oligo Fucoidan combined with chemotarget agents significantly improved the Disease Control Rate (DCR). This study provided insights into the development of cancer treatments, particularly in the combination of natural fucoidan with chemotarget agents.

Primary Endpoints

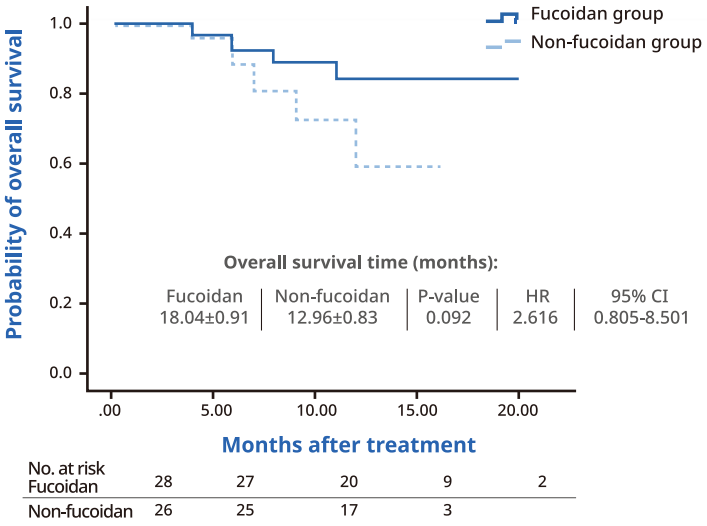
The DCR (Disease Control Rate), defined as the sum of the CR, PR, and SD rates, was significantly higher (by 23.6%) in the study group than in the control group (92.8% vs. 69.2%; p = 0.026).

	Total (n=54)	Study Group (n=28)	Control Group (n=26)	p-value
Disease control rate				0.026
*Yes (CR+PR+SD) **	44	**26 (92.8)**	18 (69.2)	
*No (PD) **	10	2 (7.2)	8 (30.8)	
Objective response rate				0.284
*Yes (CR+PR) **	29	17 (60.7)	12 (46.2)	
*No (SD+PD) **	25	11 (39.3)	14 (53.8)	

* CR : complete response; PR: partial response; SD: stable disease; PD: progressive disease classified using RECIST criteria. Version1.1

Secondary Endpoints

Secondary Outcome CR and PR rates) was comparable in the study group and the control group (60.7% vs. 46.2%; p = 0.284). Compared with the control group, the study group exhibited a trend of improved Overall Survival Rate (18.04 ± 0.91 vs. 12.96 ± 0.83 months; p = 0.092).



No adverse effects were observed in both groups during the trial period.

Full Article:

2017 [Marine Drugs], Efficacy of Low-Molecular-Weight Fucoidan as a Supplemental Therapy in Metastatic Colorectal Cancer Patients: A Double-Blind Randomized Controlled Trial

Advanced research in Mechanism:

2021 [International Journal of Molecular Sciences], Low-Molecular-Weight Fucoidan as Complementary Therapy of Fluoropyrimidine-Based Chemotherapy in Colorectal Cancer

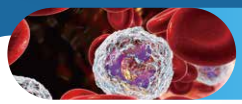
Full article

ALL INFORMATION CONTAINED IN THIS BROUCHER IS PROVIDED FOR SCIENTIFIC RESEARCH & PRODUCT DEVELOPMENT PURPOSES
HIGHLIGHTS OF SCIENTIFIC DATA, FIGURE & TABLE INFORMATION ARE PROVEN BY RESEARCH STUDIES

Hi-Q

Hi-Q is Leading in Human Clinical Trials of Oligo Fucoidan in Cancer Studies and Mechanism Research

Hi-Q collaborates with leading research institutions, hospitals and universities for advanced research and solution.More than 50 international scientific articles were published. Among the articles, over 30 explore oncology, immunomodulation and inflammation studies. Not only animal model-based pre-clinical studies, Hi-Q also invests in more than 10 human clinical trials to prove the efficacy of Oligo Fucoidan.



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2019 [Cytotechnology], The Anti-Tumor Activity of Brown Seaweed Oligo-Fucoidan via lncRNA Expression Modulation in HepG2 cells

2019 [Marine Drugs], Epigenetic Modification and Differentiation Induction of Malignant Glioma Cells by Oligo-Fucoidan

2018 [Marine Drugs], Fucoidan Inhibits Radiation-Induced Pneumonitis 2 and Lung Fibrosis by Reducing Inflammatory 3 Cytokine Expression in Lung Tissues

2018 [Cancer Letters], Fucoidan Upregulates TLR4/CHOP-Mediated Caspase-3 and PARP Activation to Enhance Cisplatin-Induced Cytotoxicity in Human Lung Cancer Cells

2017 [Scientific Reports], Fucoidan Induces Toll-like Receptor 4-Regulated Reactive Oxygen Species and Promotes Endoplasmic Reticulum Stress-Mediated Apoptosis in Lung Cancer

2017 [Scientific Reports], Oligo-Fucoidan Prevents IL-6 and CCL2 Production and Cooperates with p53 to Suppress ATM Signaling and Tumor Progression

Human Clinical Trial

2017 [Marine Drugs], Efficacy of Low-Molecular-Weight Fucoidan as a Supplemental Therapy in Metastatic Colorectal Cancer Patients: A Double-Blind Randomized Controlled Trial

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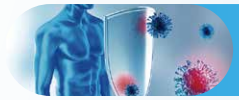

Immunomodulation and Anti-Inflammation

Human Clinical Trial

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