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POTENTIAL THERAPEUTIC USE OF A BIOACTIVE COMPOUND WITH IMMUNE PROPERTIES

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Dear Editor

Oral and mouth cancers are the most prevalent among head and neck cancers. Typically, people over the age of 60 are affected. Besides your lips, your tongue, and your ceiling are some places you can develop oral cancer. Additionally, it impacts your oropharynx, including the roof of your mouth, tonsils, and the sides and back of your throat. Oral carcinoma is a serious health problem that is treated with hormones, surgery, chemotherapy, and radiation therapy. Nearly every year, more than 450,000 new cases of oral cancer are discovered, and 40 to 50 percent of these patients have a survival rate of fewer than five years. In addition to smoking and chewing tobacco, alcohol abuse, HPV infection, and betel nut consumption are major risk factors for oral cancer. Although radiation and chemotherapy play an essential function, their effectiveness is sometimes limited. The location, stage, and general health of the patient are considered when choosing a treatment. However, there is now more focus on natural products, particularly those from marine sources, due to cancer cells' resistance to synthetic drugs and secondary cancer formation. Therapeutic researchers evaluate several diagnostic and prognostic biomarkers of head and neck squamous cell carcinoma, but their clinical relevance is still debatable.

Bioactive substances used as a healing agent

Marine metabolites typically exhibit bioactive potentials such as antibacterial, antioxidant, and anticancer actions due to their vast heterogeneity, unique chemical characteristics, and ability to preserve effectiveness at low concentrations [1]. The marine bioactive chemicals can modify apoptosis, antioxidant defense, and autophagy in cells. Blue-green algae found in spirulina can reduce the incidence and severity of oral squamous cell carcinoma (OSCC) by inhibiting the production of reactive oxygen species (ROS) [2, 3]. As well as inhibiting human OSCC cells, Prodigiosin (PG) from Serratia marcescens is also a red pigmented alkaloid [4]. Insufficient cancer cells exposed to the structural counterpart of prodigiosin have been induced to express the tumor suppressor gene p53, resulting in a series of antiproliferative responses and numerous stress signal reactions that result in apoptosis [5, 6]. Through LC3-mediated p62/LC3-I/LC3-II pathways, PG can also block the Bec-1 and mTor genes and cause autophagy in OSCC cells. [7]. Using its molecular processes, the antimicrobial peptide Pardaxin from fish (Pardachirus marmoratus) significantly inhibits OSCC cells [8]. It has caused cell death, regulated B1 Cyclin expression and the G2/M phase, and stimulated apoptosis and proliferation in OSCC cells by signaling through caspases [9, 10]. Ilimaquinone, a sesquiterpene quinonic chemical from the marine sponge Halichondria sp., was recently described by Lin et al. [11]. Through modulation of MAPK/p38 and PI3K/Akt signaling, PI3K/Akt plays an essential role in controlling OSCC apoptosis Figure. 1. Moreover, the seaweed extract Gracilaria tenuistipitata may have therapeutic benefits for OSCC. OSCC undergoes apoptosis due to

mitochondrial depolarization, ROS production, and DNA damage [12]. The effects of treatment on different stages of oral cancer have been evaluated in several clinical trials using marine bioactive chemicals. Several marine-derived substances are expected to be used to develop oral cancer medications with less cytotoxicity and no known adverse effects on humans [13].

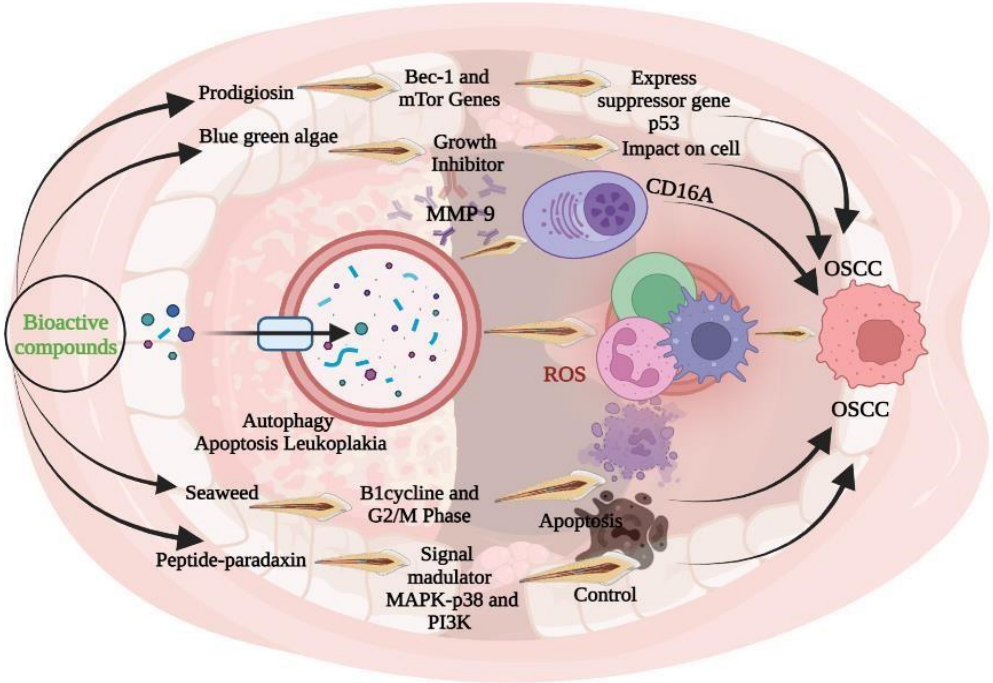

Fig. 1 Bioactive compounds - Treating oral carcinoma

Immuno Therapy: Over the past few years, immunotherapeutic antibodies have entirely changed how cancer is treated. These antibodies have shown more excellent tolerability and significant increases in long-term survival. In an orthotopic, syngeneic animal tumor model, anti-MMP9 antibody therapy inhibits tumor growth. Single targeted antibodies, however, have several drawbacks, including a) a low success rate, with most patients not responding, b) intestinal problems like colitis and diarrhea, c) toxicities like hepatotoxicity and dermatological side effects, and d) pneumonitis. Using bi-specific antibodies that target MMP9, which is involved in carcinogenesis and metastasis, and the recruitment of cytotoxic natural killer cells might be a better option (NK cells). Because they are not HLA-restricted, NK cells have an advantage over T cells.

Additionally, compared to T-cell treatments, patients may be more well-tolerated by NK-cell therapies [14]. The human NK cell-specific receptor CD16A stands out among the others. Without co-stimulatory receptors, CD16A can significantly activate cells and cause the release of IL-2 and the death of tumor cells. Bispecific antibodies targeting MMP9 produced by tumor-associated neutrophils and NK cell recruitment by CD16 may enhance antitumor activity against OSCC [15].

Declaration of Competing Interest

Competing financial interests or personal relationships did not influence the research, as far as they are aware.

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