

Biotechnology Congress 2015 : Sulphated polysaccharides from seaweeds has potential to inhibit cell growth and cell cycle arrest of human cancer cells – EkaSunarwidhiPrasedya - Fukushima Medical University

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Sulphated polysaccharides from marine algae has been previously reported to have therapeutic properties. Especially, sulphated polysaccharides such as carrageenan and fucoidan are known to exhibit strong antitumor activities. However, little is known about the mechanism of fucoidan or carrageenan antitumor activities towards human cells. In this study, firstly, we evaluated the effects of fucoidan and carrageenan towards cell growth of HeLa cells. HeLa cells were cultured with various concentrations of fucoidan (0-100 $\mu\text{g/mL}$) and carrageenan (0-1000 $\mu\text{g/mL}$). Both sulphated polysaccharides were seen to inhibit cell growth of HeLa cells. To confirm whether cell growth is truly inhibited or not, fucci fluorescent ubiquitinationbased cell cycle indicator were used to evaluate cell cycle arrest due to fucoidan and carrageenan treatment. Cell cycle was seen to be arrested at the G1 phase which indicates that later on cells would undergo apoptosis. The findings of this study so far gives the idea that fucoidan and carrageenan inhibits cell growth of HeLa cells by arresting cell cycle. Future studies are still needed to provide better understanding of the antitumor mechanisms of marine algae sulphated polysaccharides. Kelp are probably the biggest makers of biomass in the marine condition and are wealthy in bioactive exacerbates that are regularly utilized for human and creature wellbeing. Porphyrin and carrageenan are characteristic mixes got from red kelp. The previous is a trademark polysaccharide of Porphyra, while the last is notable from Chondrus, Gigartina, and different Eucheuma species, all in Rhodophyceae. The two polysaccharides have been found to have against malignant growth action by improving invulnerability and focusing on key apoptotic particles and along these lines regarded as

potential chemotherapeutic or chemopreventive specialists. This audit endeavors to survey the ebb and flow investigation of hostile to malignancy action and the potential instruments of porphyran and carrageenan got from red ocean growth to different diseases, and their helpful activities with other enemy of malignancy chemotherapeutic operators is likewise talked about. Tumors are not kidding illnesses of different etiologies, particularly that of undesirable dietary patterns and way of life. In 2018, about 9.6 million malignancy related passings and 18 million new cases were assessed by the World Health Organization (WHO) [1]. Uncontrolled development, obtrusiveness, and metastasis are qualities of tumor cells evoked by procured hereditary changes [2]. With tumor advancement, unequal modified cell passing, disarranged flagging pathways, angiogenesis, and poor invulnerable reaction upset different homeostatic pathways. Such deregulated pathways are the primary focuses of malignant growth treatment by chemotherapy [3]. As per the qualities and phase of the tumor, joined treatment is applied in malignant growth treatment including medical procedure, chemotherapy, radiation treatment, and immunotherapy. A definitive point of all medicines is to crush the tumor cells in the accomplishment of malignancy treatment, while abstain from harming typical cells quite far. Sadly, extreme reactions are regularly unavoidable, restricting the viability of treatment. Chemotherapy is ordinarily and successfully utilized in disease therapeutics, applying cytotoxicity on quickly isolating and multiplying cells, including harmful cells, yet in addition ordinary cells with high-multiplying potential. In this way, chemotherapy ordinarily brings genuine reactions including paleness, craving misfortune, wooziness, alopecia, fringe neuropathy, and irreversible harm to imperative organs [4]. What's more, tranquilize

resilience is likewise an issue in malignancy treatment, which would debilitate the treatment impacts. Directed treatment could stay away from the symptoms to some extent, however not in every case totally. Monoclonal antibodies are commonly more secure than chemotherapy just with gentle hypersensitive responses, for example, urticaria for the structure of an explicitly focused on treatment to the malignant growth antigens situated on tumor cells. Nonetheless, extreme responses are still difficult to maintain a strategic distance from. For example, patients who have a high weight of tumor cells in their dissemination would confront a high danger of tumor lysis disorder and other extreme inconveniences, for example, anaphylactic responses and myocardial localized necrosis in intermittent cases [5]. Accordingly, growing low reaction and better-endured hostile to malignant growth operators is convincing. Characteristic items are alluring hotspots for the advancement of new restorative and helpful specialists for their phone specific and less antagonistic impacts. In this unique circumstance, it is noteworthy to create characteristic items in disease treatment. As per reports, characteristic starting points are the principle birthplaces for affirmed tranquilizers in the treatment of malignant growth, involving practically 60% [6]. Despite the fact that the advancement of marine common items is still in its undeveloped stage, it is foreseen that marine characteristic items will turn into an important hotspot for the improvement of new restorative and remedial operators in disease treatment due to their huge living space (covering ~70% of the Earth's surface), high biodiversity (95% of world biodiversity), and the particular conditions under which a few animal varieties live [7,8]. It has incredible breadth in which find new enemy of malignant growth medication for huge creation, organic action, and have interesting synthetic compounds. In the course of the most recent couple of decades, pharmaceutical

organizations and scholastic foundations have put forth noteworthy attempts in determining and distinguishing new marine items from marine life forms, with in excess of 3000 new enemy of malignant growth mixes [9]. Exceptionally compelling are the items gotten from ocean growth with hostile to malignant growth potential in normal marine items. Ocean growth are broadly conveyed in chilly, calm, and tropical zones and assume indispensable jobs in supporting the biodiversity and biology of marine biological systems. A few types of monetary worth, for example, Laminaria, Porphyra, and Gracilaria are refined in the waterfront waters of numerous nations [10]. Kelp are low in lipids, plentiful in proteins, minerals, nutrients, cancer prevention agents, phytochemicals, polyunsaturated unsaturated fats, and are likewise a wellspring of countless novel mixes with remarkable medical advantages, for example, basic amino acids and their proteins just as fundamental minerals [11,12]. Epidemiological investigations have indicated that an ocean growth rich eating regimen decreases the occurrence of corpulence, malignancy, and heart and cerebrovascular maladies [13]. An enormous number of studies have revealed the counter malignant growth exercises of ocean growth and various kelp determined aggravates that have been demonstrated to be successful through different components, for example, the restraint of disease cell development, obtrusiveness and metastasis just as by the enlistment of apoptosis in malignancy cells.

Biography

EkaSunarwidhiPrasedya is a PhD candidate pursuing his PhD in Fukushima Medical University, Japan. Previously, he earned his Bachelor's degree from GadjahMada University, Jogjakarta, Indonesia and Master's degree from Universiti Malaya, Kuala Lumpur, Malaysia.

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