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Effects of *Cucumaria frondosa* against melanoma cell cancer

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### Abstract

Melanoma cell cancer (MCC) is one of the most common skin cancers and the second leading cause of death in the United States. This skin cancer undergoes distant metastasis to the vital organs if not treated at an early stage. Current treatment options available for MCC have failed to satisfactorily halt the spread of this cancer. In this research, we considered the possibility of a natural product, sea cucumber (*Cucumaria frondosa* ([C. frondosa])) with important bioactive components as a preventive therapeutic option against MCC. The bioactive components include monosulfated triprenoid glycoside Frondoside A; the disulfated glycoside Frondoside B; the trisulfated glycoside Frondoside C; 12-methyltetradecanoic acid; ecosapentaenoic acid; and fucosylated chordinin sulfate. We have studied the effectiveness of the fluid present in the coelomic cavity of *C. frondosa* and different preparation of extracts of *C. frondosa* on the spleen cell proliferation, macrophage phagocytosis, and growth of murine melanoma cell line, B16-F10. Our results suggest that the extracts of *C. frondosa* have a potential of inhibiting the growth of MCC. The same extracts in sub toxic doses have shown an immuno-stimulatory effect by inducing proliferation of mice spleen cells. In future this marine invertebrate may be recognized as a potential nontoxic and natural source for preventing MCC progression and may play a promising role in reducing mortality and morbidity of the suffering population.

### Methods

- Melanoma cell proliferation assays with commercial extract, coelomical fluid and crude tissue extracts of *C. frondosa*.
- Spleen cell proliferation assays with commercial extract, coelomical fluid and crude tissue extracts of *C. frondosa*.
- Phagocytosis assays with commercial extract, coelomical fluid and crude tissue extracts of *C. frondosa*.
- Bio-assay of commercial extract, coelomical fluid and crude tissue extracts of *C. frondosa*.

### Results

- *Cucumaria frondosa* extracts in our in vitro experiments, have shown to significantly inhibit the growth of murine melanoma cell line B16-F10.
- The tissue extracts prepared in our lab have also shown to induce immune response by increasing mouse spleen cell proliferation and enhancing phagocytic activity of the mouse macrophages.
- Further research would establish and validate the effectiveness of *C. frondosa* extracts in preventing melanoma cell cancer progression and also in immunomodulation. This sea cucumber may become a new platform for cancer therapy through its potential anticancer property.

### Conclusions

- *C. frondosa* extracts prepare in our lab have shown to induce immune response by increasing mouse spleen cell proliferation and enhancing phagocytic activity of the mouse macrophages.
- Further research would establish and validate the effectiveness of *C. frondosa* extracts in preventing melanoma cell cancer progression and also in immunomodulation. This sea cucumber may become a new platform for cancer therapy through its potential anticancer property.

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### References