



PROJECT TITLE: Valorization of coastal-biomaterials for tissue engineering and personalized medicine discovery

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PROJECT SUMMARY:

Combating cancer is one of the greatest socioeconomic challenges of the 21st century globally and the investigation and development of new therapies addressing these diseases becomes extremely important. Hepatocellular carcinoma (HCC) is the second most cause of cancer-related deaths worldwide caused mostly by viral hepatitis, excessive alcohol consumption and fatty liver disease, and its increasing incidence is quite alarming. Tissue engineering strategies are being increasingly studied in order to create alternative new advanced and efficient therapies aiming at successful and cost-effective treatments for cancers. More recently, it has been recognized the importance of personalized medicine in tissue engineering, envisioning the development of customized approaches, where bioengineered products are tailored to meet patient requirements and to improve patient outcomes, including patient recovery time, in the treatment of several diseases and medical conditions. Therefore, it is highly essential to develop a tissue-engineered, cancer model that mimic the pathological micro-environment of HCC more accurately, for effective treatment with ant-HCC drugs. Coastal-biomaterials, particularly alginate, chitosan, fucoidan, collagen and related polymeric substances are great resources to valorise for such tissue engineering and personalized medicine applications, due to ease of availability, fine-tuned cross-linking chemistry to generate hydrogel and biocompatibility. Therefore, it is possible to explore the feasibility of utilizing various novel carbohydrate and protein-based coastal-biomaterials apart from already explored marine-origin biopolymers and utilizing them for innovative tissue engineering and personalized medicine applications for cancer treatment.