From Corals to Neo Bone Implants

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One of many 21st century health problems is bone and joint defects derived from injury or erosion. Currently, joint implantations such as in the hip and shoulder are performed by insertion of a metallic implant into the patient's body, which holds the joint in place. Metallic implant insertion may produce an inappropriate implant-to-bone-tissue bond, tissue damage, and expanded patient suffering, therefore missing the main goal of this medical procedure which is to help and upgrade the patient's standard of living. The use of coral that deposits calcareous skeleton was suggested as a potentially suitable raw source for medical treatments. By using a variety of six corals species and a large coral nubbins sampling size and implementing the "Coral nubbins" method (Nubbins assay), both genomic and physical factor effects on the coral's tissue growth and area coverage nature were examined. Results showed significant survivorship differences between all six examined species. Only three of the initial six coral species survived and grew visible horizontal tissue that could be statistically analyzed (*Stylophora pistillata*, *Chyphastrea sp.* and *Pavona cactus*). Moreover, results revealed a variety of growth effects- by genotype only (*Chyphastrea sp.*), by both genotype and distance (*Stylophora pistillata*) and no significant effects (*Pavona cactus*). In both *Stylophora pistillata* and *Chyphastrea sp.* one of the variety of three genotypes per specie showed a greater effect on the corals tissue growth (genotype 1 in *Stylophora pistillata* and genotype 3 in *Chyphastrea sp.*). The interaction between genotype and distance as factors that affect coral tissue growth is statistically significant in these two mentioned corals, but in a different nature in every coral specie, which still needs to be further researched. Results show an initial glimpse into an unclear domain of coral growth effects and interactions that holds a great potential in becoming a new natural source for medical use such as bone and joint implants.

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