Engineered coral, an optimal scaffold for tissue engineering of bone.

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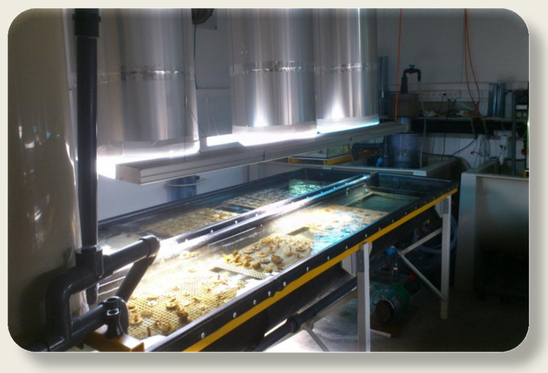
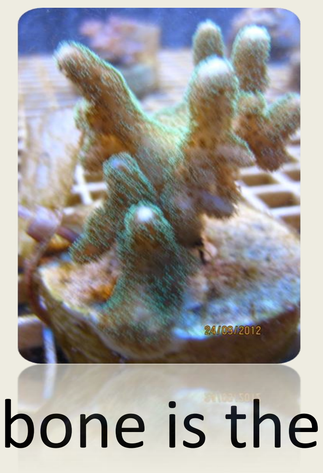
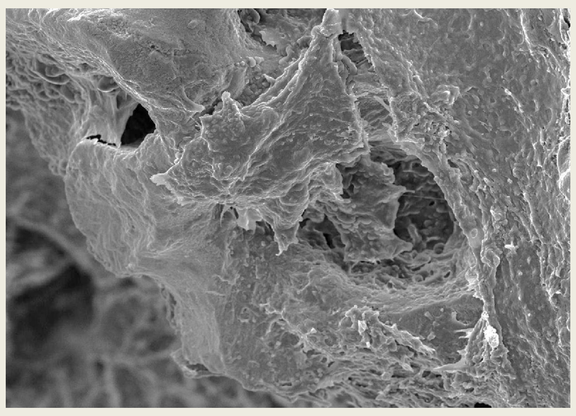


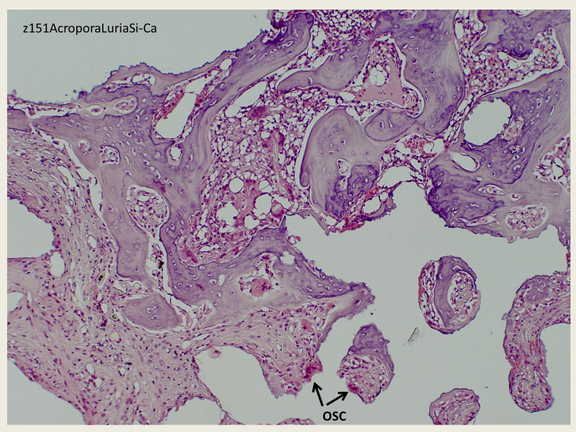


Grow coral with bioactive nutrients

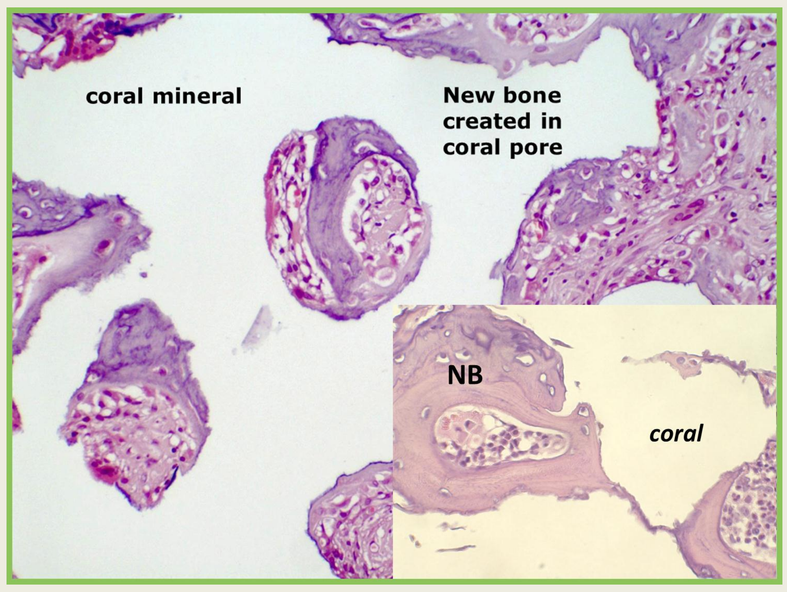
- **Introduction**: Generation of bone is the challenge faced by current technologies in tissue engineering, depending highly on bioactive scaffolds and osteoprogenitors. An early cell-scaffold interaction is a crucial determinate to initiate a sequence of cellular and molecular events activating osteogenic pathway. Calcium carbonate in the form of Aragonite crystals, the exoskeleton of coral from sea origin was shown to be a passive scaffold allowing bone to form in close proximity to this mineral. **Our Aim :** was to modify the exoskeleton mineral of coral during its growth in aquariums by incorporating silicium in its intrinsic structure, during growth. The silicium enriched coral mineral scaffold was tested for its activity to attract osteoprogenitors on its surface producing bone directly on the coral mineral surface.
- **Methods:** Our DA rat model was employed to test osteogenesis when modified coral was mixed with fresh marrow at thoracic ectopic site(Bahar et al, 2010).
- **Results:**



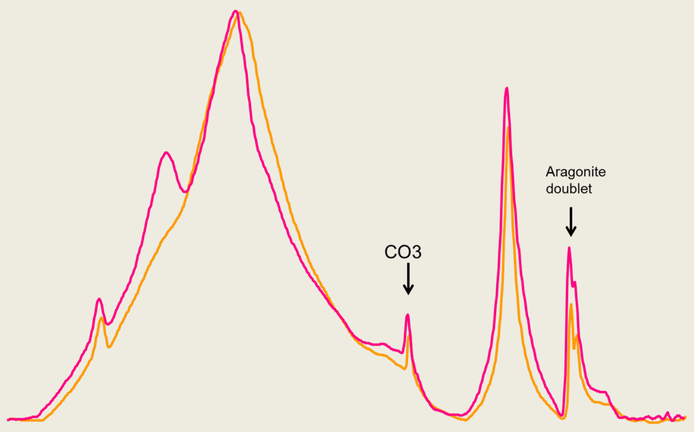
Adherent mesenchymal cells to coral particulate



3 weeks after coral particulate with fresh marrow transplantation ,new bone was formed directly onto coral mineral



Bone is forming in the coral pores. See blood vessels and new marrow.



Infrared spectroscopy of coral grown in aquarium, same as sea coral

In conclusion: we demonstrate that corals grown in aquariums under controlled light and sea medium conditions is transformed into a most bioactive scaffold for engineering of bone.

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