

DEVELOPMENT OF A LASER SCANNING CONFOCAL
MICROSCOPIC TECHNIQUE TO EXAMINE THE STRUCTURE AND
COMPOSITION OF MARINE SNOW

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ABSTRACT

A technique was developed to image marine snow particles by laser scanning confocal microscopy (LSCM). This method allows structural and compositional characterization of fully hydrated marine snow particles with minimal disruption to the particle structure. High specificity fluorescent stains permitted sequential imaging of polysaccharides (Concanavalin A), proteins (DTAF) and DNA (Propidium Iodide). Chlorophyll *a* autofluorescence can also be imaged. LSCM produced optical slices of marine snow particles that were suited for a number of image processing applications. These applications include high resolution fluorescently derived optical slices and composite images produced from combined optical slices. Initial observations suggest that marine snow particles found in the oligotrophic Pacific Ocean vary in composition and structure. Variations in mannose/glucose and protein composition of marine snow particles may be related to particle morphology. When combined with other conventional analysis, such as epifluorescent microscopy and SEM/TEM, LSCM can provide important contributions to characterizing composition and structure of marine snow.