Workshop on Scanning Probe Nanotechnology

Experimental Physics Department - University of Torino, Italy
16-17 December 2002

A full immersion SNOM for in-vivo analysis of cellular internal dynamics

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Abstract

We custom built a SNOM system with the aim of demonstrating the potential uses of a SNOM in biological imaging. We will demonstrate that SNOM systems can be used to monitor the dynamics of living cells at sub-nanometric vertical resolution and about 100 nm lateral. Also, we will describe a method to produce cheap SNOM probes. The method is to fabricate nano-apertured tips from commercial cheap communication optical fibers. The technique will be described and will be shown that the tips are fully operational and demonstrate a good optical resolving power (100 nm). As far as we know, our method makes the cheapest SNOM probes within this resolution range.

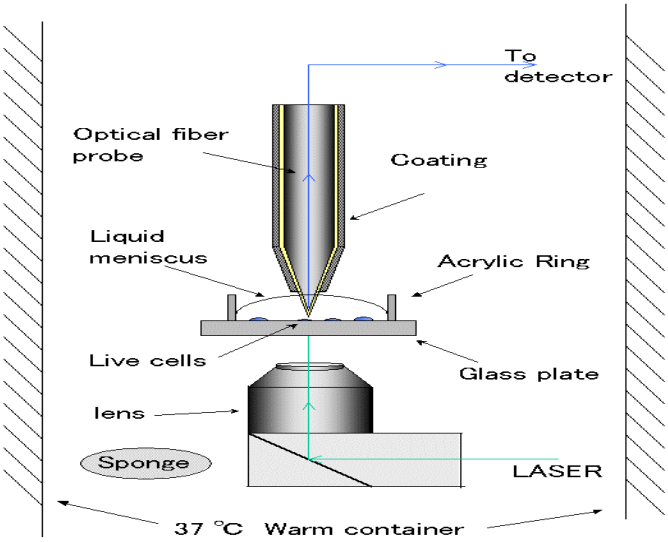

Figure 1: A schematic view of a Near Field Optical System f imaging on live biosamples.

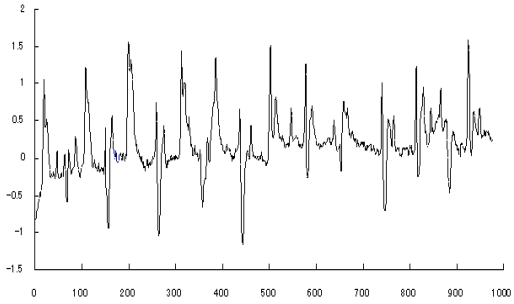

Figure 2: Cardiac myocytes live dynamics obtained with the system described. Vertical minimum discrimination is better than 1 nanometer.