

ATOMIC FORCE MICROSCOPY OF THE NUCLEUS *IN SITU*

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Atomic force microscopy has been used in biology mainly to analyze isolated molecules. We have been exploring the possibilities of studying cell structure *in situ* with this instrument, by using an approach where samples are prepared for standard transmission electron microscopy (1, 2). Briefly, samples are fixed, dehydrated and embedded in epoxy resin. Stained or unstained semithin sections are placed onto a glass and they are observed by atomic force microscopy working either in contact or non contact mode. Our laboratory has been working on the structure and function of plant nuclear structure (3-7) and therefore we use this organelle to test our approach. Here it is presented an overview of previous and recent work by correlating light, electron and atomic force microscopy we have been able to visualize nuclear structures as chromatin, nucleolus, nucleolar organizer, nuclear bodies and even nucleolar substructure as dense fibrillar component and interstices of several biological sources as the plant species *Lacandonia schismatica*, *Soridium* sp., *Taxodium mucrunatum*, *Ginkgo biloba* and animal samples too. In fact, we now use atomic force microscopy as a criterion to identify reticulated nucleus in plants (8). Other organelles as plastids, vacuoles and cell walls have also been observed. Starch granules are indicative of chloroplast structure.

Recent observations of cultured cells and visualization of samples both in dried or physiological solution revealed that structure of nuclear organelles is maintained.

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References

- (1) Jiménez-García, L.F. and Fragoso-Soriano, R. J. Struct. Biol (2000) 129, 218.
- (2) Jiménez-García, L.F. and Segura-Valdez, M. L. Methods in Mol. Biol. (2004), 191.
- (3) Jiménez-García, L.F. et al., Biol. Cell (1992) 75, 101.
- (4) Agredano-Moreno, L.T. et al., Biol. Cell (1994) 82, 177.
- (5) Jiménez-García, L.F. et al., Bol. Soc. Bot. Méx. (1998) 62, 5.
- (6) Agredano-Moreno, L.T. and Jiménez-García, L.F. Biol. Cell (2000) 92, 71.
- (7) Agredano-Moreno, L.T. et al., (2001). J. Struct. Biol. (2001) 136, 1.
- (8) Jiménez-Ramírez, J. et al., Biol. Cell (2002) 94, 511.

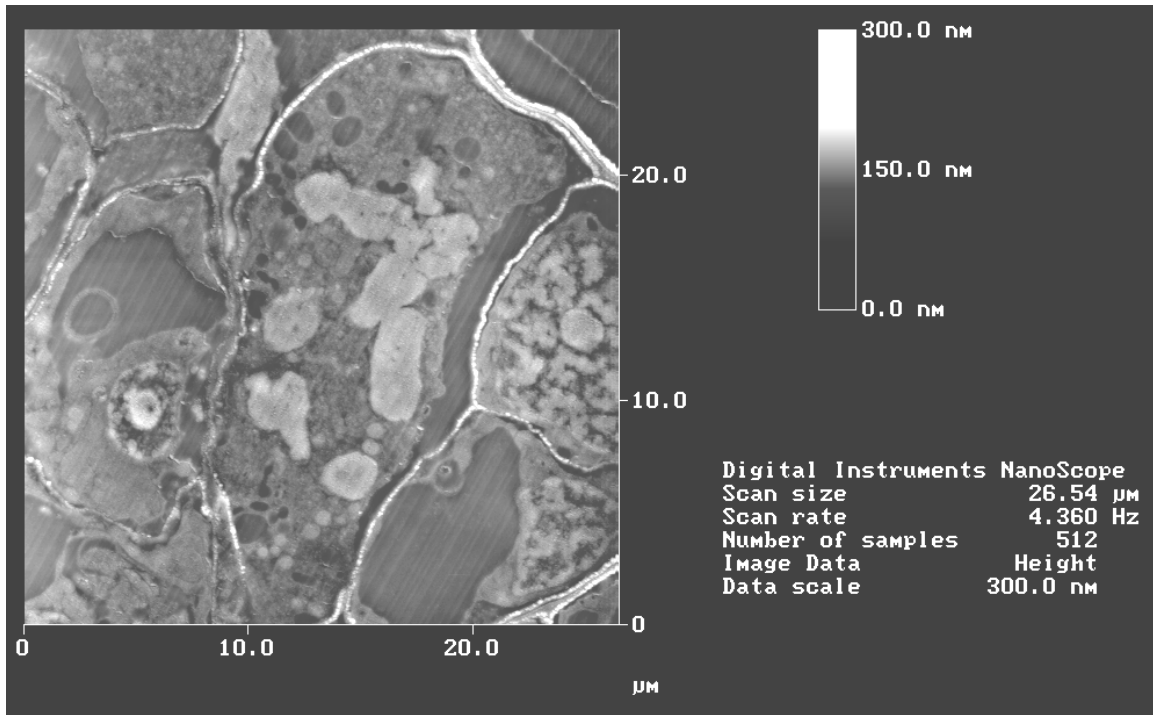


Figura 1. Atomic force microscopy of interphase and mitotic nucleus of the plant *Lacandonia schismatica*. Chromatin and chromosomes are shown.