

## Applications of AFM in 4D to Optimize the Design of Genetic Nanoparticles

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**Abstract :** Filming the behaviors of individual DNA molecules in their environment when they interact with individual medicinal nano-polymers in a molecular scale has opened the door to understand the effect of the molecular shape, size, and incubation time with nanocarriers on optimizing the design of robust genetic Nano molecules able to resist the enzymatic degradation, enter the cell, reach to the nucleus and kill individual cancer cells in their environment. To this end, we will show how we applied the 4D AFM as a guide to finetune the design of genetic nanoparticles and to film the effects of these nanoparticles on the nanomechanical and morphological profiles of individual cancer cells.

**Keywords :** AFM, dendrimers, nanoparticles, DNA, gene therapy, imaging

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