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Atomic force microscope for investigation of DNA-hydrolyzing activity of anti-DNA antibodies

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Abstract

Interaction of DNA-hydrolyzing antibodies and DNA with super-twisted plasmid DNA pBR-322 was studied at one of wide spread human autoimmune disease of unknown etiology - exanthematous systemic lupus. It is shown that investigated antibodies and DNA are endonucleases and make one-thread breaks in super-twisted DNA molecules, transforming them into the ring molecules. Using atomic force microscopy, formation of stable immune complex antibody-DNA was registered, the complex size exceeding individual sizes of antibodies and DNA molecule. Probably, abzymes interact with DNA initially with the mechanisms characteristic for antigen-antibody immune complex formation, and further the antibody fermentative properties manifest. However, unlike ordinary DNAses, after phosphodiester bond hydrolysis the antibody molecule is not disengaged from DNA molecule.
