

Comparing DNA Sequences by Atomic Force Microscopy

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Atomic force microscopy (AFM) technology can be used to identify homologies and differences between DNA molecules. By forming heteroduplexes between two closely related DNA molecules, nonhomologous regions caused by, deletions, substitutions, and perhaps even single base mutations, can be precisely located by AFM imaging.

We have identified deletions of 22 to 450 bp in heteroduplexes of linearized mutant and wildtype pSV- β -Galactosidase plasmid (6821 bp). By combining with an AFM technique we developed for restriction mapping DNA molecules, which employs a cleavage deficient mutant *EcoRI* endonuclease site-specifically bound to sequence specific sites, we have precisely mapped deletions relative to the *EcoRI* sites on the pSV- β -Galactosidase heteroduplexes

We have imaged the specific binding of mismatch repair enzymes to heteroduplexes between wildtype and plasmids with point mutations. Conditions to maximize binding efficiency and define specificity for different types of mispairing are being evaluated on plasmid constructs.

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