

Micro Bubble Dynamics In Dna Solutions Institute Of Physics

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Micro Bubble Dynamics In Dna It is found that the bubble dynamics in ssDNA solutions is different from that in DI water, and an obvious retardation effect on the motion of the micro bubble was observed at high ssDNA ... (PDF) Micro bubble dynamics in DNA solutions Micro bubble dynamics in DNA solutions and 400 μm in thickness) was used as the substrate. The wafer was coated with 0.5 μm silicon oxide and 1.5 μm low stress silicon nitride on both sides of the wafer by wet thermal oxidation and low-pressure chemical vapor deposition (LPCVD) processes, respectively. A 0.01 μm thick Ti film and Micro bubble dynamics in DNA solutions A micro vapor bubble was generated in ssDNA using a micro bubble actuator, which is capable of producing periodic and stable single vapor bubbles under pulse heating. The growth and collapse of the micro vapor bubble were visualized by a high-speed CCD camera, and the bubble dynamics was investigated at different ssDNA concentrations and under various pulse widths. Micro bubble dynamics in DNA solutions - NASA/ADS The formation of local denaturation zones (bubbles) in double-stranded DNA is an important example of conformational changes of biological macromolecules. We study the dynamics of bubble formation in terms of a Fokker-Planck equation for the probability density to find a bubble of size n base pairs at time t , on the basis of the free energy in the Poland-Scheraga model. [PDF] Bubble dynamics in DNA | Semantic Scholar We report the first measurement of the dynamics of bubble formation in double-stranded DNA. Fluctuations of fluorescence of a

synthetic DNA construct, internally tagged with a fluorophore and a quencher, are monitored by fluorescence correlation spectroscopy. The relaxation dynamics follow a multist ... Bubble Dynamics in Double-Stranded DNA Bubble Dynamics in Double-Stranded DNA The bubble count and size dispersity were very similar to those generated from a suspension of DPPC:DPPA:DSPE-PAA without DNA attached. Since the generation of nonlinear echoes depends on the size oscillations of the microbubble under ultrasound, we employed a home-built modulated light scattering apparatus described previously to distinguish oscillating microbubbles from static ones (Figure ... DNA-Coated Microbubbles with Biochemically-Tunable ... To improve the performance of the micro DNA biosensor, we propose to introduce distributed active bubble perturbations in the hybridization solution for the purpose of enhancing the molecular diffusion and consequently the DNA hybridization process. A novel micro bubble actuator of specially designed micro heater ($10 \times 3 \mu\text{m}^2$) and single bubble system was developed based on MEMS technology for bubble generation with high controllability and reliability. Micro bubble actuator for DNA hybridization enhancement ... To quantify the ultrasound-induced targeted microbubble dynamics, bubble radius change under the ultrasound stimulation was evaluated and bubble oscillation-induced the maximum shear stress on the cell membrane was estimated according to Newton's law of viscosity assuming a "no-slip" boundary condition : $(1) S = 2 \pi \frac{3}{2} \epsilon_0 \rho f^3 \mu^{1/2} R_0$ where ϵ_0 is the instantaneous radius ... Ultrasound and microbubble mediated

plasmid DNA uptake: A ... We investigate the distribution of bubble lifetimes and bubble lengths in DNA at physiological temperature, by performing extensive molecular dynamics simulations with the Peyrard-Bishop- Dauxois (PBD) model, as well as an extended version (ePBD) having a sequence-dependent stacking

Distributions of Bubble Lifetimes and Bubble Lengths in DNA

The effects of Marangoni force, buoyancy force and drag force on the bubble dynamic phenomena have been studied utilizing experimental data. The results obtained from this study are not only helpful for understanding the microscale thermal bubble dynamics but also useful for optimization of micro cooling equipment and development of novel thermal bubble-based MEMS (micro-electro-mechanical-system) devices. Bubble dynamics under a horizontal micro heater array ... The issue of the nucleation and slow closure mechanisms of non-superhelical stress-induced denaturation bubbles in DNA is tackled using coarse-grained MetaDynamics and Brownian simulations. A minimal mesoscopic model is used where the double helix is made of two interacting bead-spring rotating strands with a prescribed torsional modulus in the duplex state.

DNA denaturation bubbles: Free-energy landscape and ...

Even under physiological conditions, the DNA double-helix spontaneously denatures locally, opening up fluctuating, flexible, single-stranded zones called DNA-bubbles. We present a dynamical description of this DNA-bubble breathing in terms of a Fokker-Planck equation for the bubble size, based on the Poland-Scheraga free energy for DNA denaturation.

Dynamic Approach to DNA Breathing

Very recently Chatterjee et

al. proposed a model for the bubble dynamics of DNA where the distance between the fluorophore and the quencher follows an overdamped Langevin equation in a harmonic potential. Although their theory predicts the experimental data reasonably well it does not take into account of the fluctuation of different modes of the DNA strand contributing to the bubble dynamics. Bubble dynamics in double stranded DNA: A Rouse chain ... More recently, transient micro-thermal bubble generation and its subsequent dynamic behavior in a 60-base single-stranded DNA (ssDNA) solution was investigated with particular emphases on the effects of DNA concentration and the total viscosity of the solution on bubble dynamics (Deng et al., 2004). It was found that the DNA macromolecules had a strong retardation effect on bubble dynamics at high concentrations. Two-dimensional micro-bubble actuator array to enhance the ... It has also be found that the DNA dynamics in the presence of UV induced dimers between two adjacent thymine bases (TT-dimers) is dramatically altered in the neighborhood of the dimer, suggesting an enhancing role for the large fluctuations present at the dimer site in the dimer recognition pathway. Bubble Statistics and Dynamics in Double-Stranded DNA With the combination of high-speed video microscopy and 3D confocal fluorescence microscopy, we show the spatiotemporal correlation between the microbubble dynamics and intracellular plasmid DNA distribution. Two ultrasound modes (high pressure short pulse and low pressure long pulse) were chosen to trigger different plasmid DNA uptake routes. Ultrasound and Microbubble Mediated Plasmid DNA Uptake: A ... In this work, we present a model for

micro-bubble oscillation dynamics in a rigid tube which is derived from the reduced Navier-Stokes equation. This model is not a variant of the RP equation and is a super-set of all the conventional RP variant models. 22. The schematics of the model are shown in Fig. Fig.1. 1. The underlying assumption of the model is that the micro-bubble, during sonication, remains spherical. Dynamics of micro-bubble sonication inside a phantom ... Measurements of micro bubble nucleation temperature in single-stranded DNA (ssDNA) solution with four different concentrations (0.4, 1, 6.4 and 10 $\mu\text{g } \mu\text{l}^{-1}$) and under different heat fluxes are ... (PDF) Measurements of micro bubble nucleation temperatures ... Applying microsecond laser pulses to the 100- 200 strongly absorbing melanin granules inside the RPE cells induces transient micro bubbles which disrupt the cells. Aim of this work is to understand bubble dynamics in clusters with respect to the influence of the adjacent retina. Bubble dynamics were investigated in vitro on porcine RPE. FeedBooks: Select the Free Public Domain Books or Free Original Books categories to find free ebooks you can download in genres like drama, humorous, occult and supernatural, romance, action and adventure, short stories, and more. Bookyards: There are thousands upon thousands of free ebooks here.

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