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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. A0.01 μm thickTifilmand

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 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 ...

DNA-Coated Microbubbles with Biochemically-Tunable ...

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

Combining real-time fluorescence microscopic imaging and mathematic modeling, we estimated the pore size in 20 cells with single bubble attached, and found out that when the initial pore radius was > 35 nm, the pore allowed plasmid DNA passage, independent of pore resealing dynamics.

Ultrasound and microbubble mediated plasmid DNA uptake: A ...

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 ...

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 ...

Bubble dynamics under a horizontal micro heater array. Xiaopeng Qu and Huihe Qiu 1. Published 24 August 2009 • 2009 IOP Publishing Ltd ... Deng P G, Lee Y K and Cheng P 2005 Measurements of micro bubble nucleation temperatures in DNA solutions J. Micromech. Microeng. 15 564-74. IOPscience Google Scholar

Bubble dynamics under a horizontal micro heater array ...

DNA bubbles result from the conversion of a segment of the double-stranded helices into two isolated single strands due to the hydrogen bond breaks. Their formation within a dsDNA molecule leads to a local decrease in the rigidity of the DNA molecule.

How does temperature impact the conformation of single DNA ...

Micro-bubble response with acoustic parameters is consistent with experiments and provides physical insight to the micro-bubble oscillation dynamics. Micro-bubbles in the form of encapsulated contrast agents are conventionally used in ultrasound diagnostics.

Dynamics of micro-bubble sonication inside a phantom ...

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 ...

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 ...

Dynamic Micro-bubble Generator for Water Processing and Cleaning Applications Abstract The micro-bubble technology in water is widely known and effectively used, but the fundamental mechanisms of the micro-bubble generation and characteristics are not clearly established.

Understanding the Fundamental Mechanisms of a Dynamic ...

Microfluidics emerged in the beginning of the 1980s and is used in the development of inkjet printheads, DNA chips, lab-on-a-chip technology, micro-propulsion, and micro-thermal technologies. Typically, micro means one of the following features: Small volumes (μL , nL, pL, fL) Small size; Low energy consumption; Microdomain effects

Microfluidics - Wikipedia

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 ...

Dynamic Approach to DNA Breathing

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.

[PDF] Bubble dynamics in double-stranded DNA. | Semantic ...

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 path- way.

Bubble Statistics and Dynamics in Double-Stranded DNA

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.

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