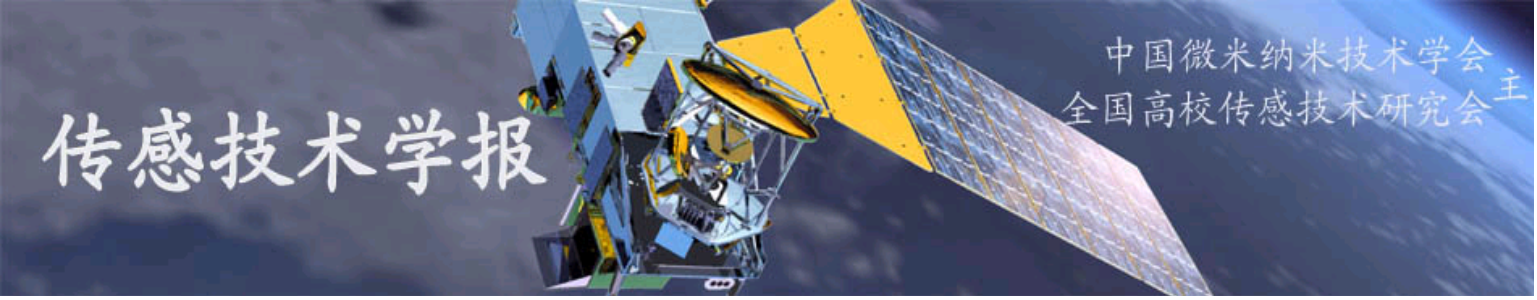

硅对聚合酶链式反应抑制作用的实时定量实验研究

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摘　要：

采用实时定量PCR的方法研究了硅表面对乙肝病毒(HBV)DNA扩增过程的抑制作用。实验中采用HF处理的H终止硅和与自然氧化的硅片作为样品，按照1.0mm2/μ
5.2mm2/μl的面体比（硅片总表面积与PCR反应液的体积之比）与PCR反应液预混合（未加DNA样品，同时，Taq DNA聚合酶的浓度分别为0.2U/35μl和1.0U/35μl）
充分混合预设的时间后，取出硅片，汲取上清液与DNA样品混合后采用实时定量PCR仪SlanTM进行扩增。扩增结果的荧光曲线表明：自然氧化的硅样品对PCR
作用更强，其对Taq聚合酶的抑制效果大于4.4mU/mm2；高面体比条件下，即使在初始扩增阶段，也达不到理想的指数形式；缩短芯片反应时间有利于降低材料
扩增的抑制效应。

关键词：硅抑制作用，聚合酶链式反应， 实时定量PCR

Experimental studies of silicon inhibition effects on polymerase chain reaction: a real-time approach

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Abstract:

A real-time PCR approach was used to study inhibition effects of the silicon surface on amplification of the hepatitis B virus genome. H-terminated silicon and natively oxidized silicon were tested in PCR reagents (with Taq DNA polymerase, but without DNA in) with deliberate designs. After slight oscillations, supernatants were extract and mixed with DNA to perform the real-time amplification and detection. Fluorescence histories indicated that: (I) Compared to the H-terminated silicon, the samples with native oxide layer restrained the polymerase catalytic activity much more severely, and the 1mm2 native oxide surface could restrain at least 4.4mU polymerases' catalyt activity;(II)The amplification processes could not even realize an exponential form at the beginning of the amplification for these high surface-to-volume ratio cases; (III) Longer mixing time of silicon pieces and PCR reagents resulted in lower amplification efficiency.

Keywords: silicon inhibition effects，polymerase chain reaction, real-time PCR