SERS-melting: A new method for discriminating mutations in DNA sequences

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Supporting Information

Reflectance spectrum of SSV substrate.

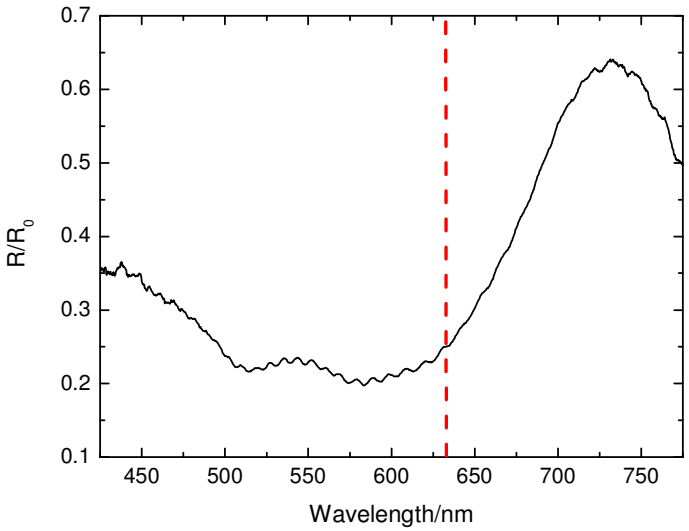

Figure S1. Reflectance spectra of a gold SSV substrate fabricated using 600 nm sphere templates and electrodeposited to a thickness of 480 nm. The reflectance is normalized with respect to flat gold. The dips correspond to plasmon absorption on the substrate. The laser line is shown by the dashed line.

Absorption spectra of dye labeled targets

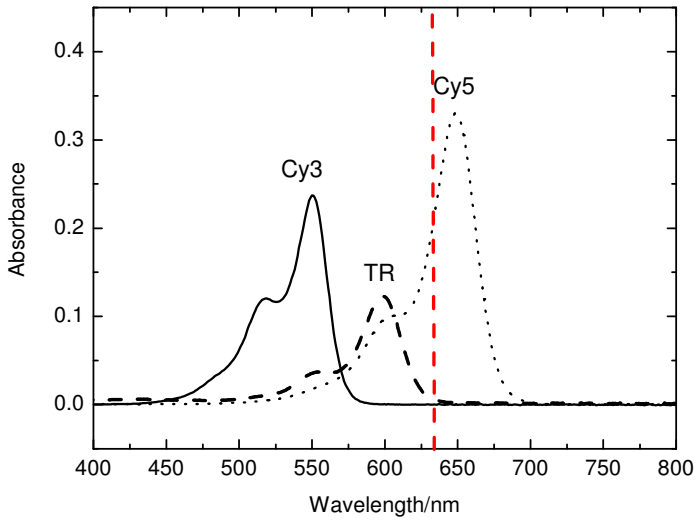

Figure S2. Absorbance spectra of dye labeled (Cy3, TR: Texas Red and Cy5) oligonucleotides at 1 μM concentration in aqueous solution. The laser line is shown by the dashed line.

Spectra of the different Cy5 labels

In case of the synthetic model oligonucleotides (22-mers) the Cy5 label was attached at the 3'-end through –NHS ester coupling while in case of the PCR products the primer was labelled at the 5'-end through a modified phosphoramidite. Also there are two sulphonate groups attached to the former compared to the latter (F**ig. S3a**). These differences lead to a distinct spectrum for each of the labels. For example, it results in a 25 cm^{-1} shift in the band corresponding to the alkene chain deformation of the Cy5 molecule and the absence of the 700 cm^{-1} in the 5-Cy5 (**Fig. S3b)** which was easily identified with SERRS on SSV substrates. This change would have been extremely difficult to detect by fluorescence.

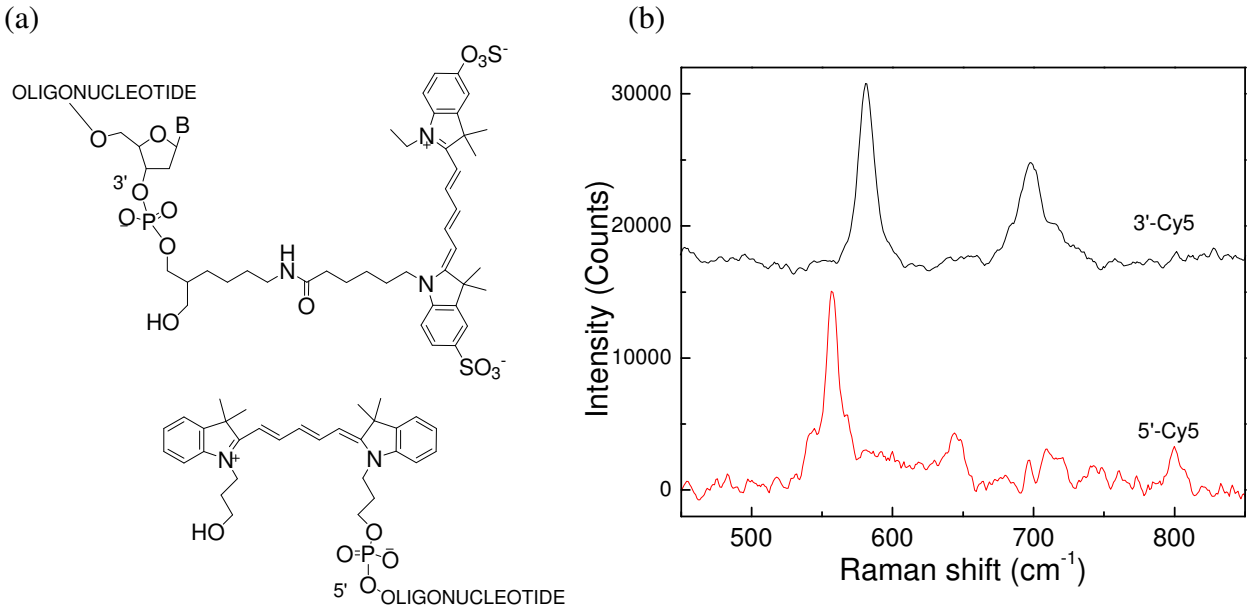

Figure S3. Structure and SERS spectra of Cy5 targets**.** (a) The two Cy5s used in labelling oligonucleotides, the 3'-Cy5 (top) attached through NHS ester coupling and the 5'-Cy5 (bottom) attached using phosphoramidite chemistry. (b) Spectra for each of the target oligonucleotide labeled with the respective Cy5s. They show a distinct shift of the bands, for example the 583 cm^{-1} peak shifts to 557 cm^{-1}.