SUPPORTING INFORMATION PARAGRAPH

A surface modification with GOPS ((3-Glycidyloxypropyl)trimethoxysilane, Fluka) was used to immobilize the 30 bp amino modified oligonucleotides (capture probes) on the chip surface. For the silane modification, freshly activated chips were immersed in a 10 mM silane solution in dried toluene and incubated for 4 – 6 h at 70°C under reflux. Afterwards the chips were thoroughly washed twice for 5 min each in toluene, ethanol and water and then finally dried under a stream of nitrogen. The substrates were then ready for the binding of the amino modified capture probes.

To precisely place the droplets of the capture probes over the electrode gap a "SpotBot" needle spotter (ArrayIt; TeleChem International, Inc.; Sunnyvale, USA) was used. Different capture DNA probes were immobilised on the chip: a complementary probe (NS150), a probe with one mismatch (NS151), a probe with 3 mismatches (NS153) and a noncomplementary probe (N7), each 30 bp long. Two electrode pairs on each chip were not modified with any DNA probe to serve as controls for the background signal after the silver enhancement. The capture probes were dissolved in 0.1 M KOH to a concentration of 15 μM. After spotting, the chips were allowed to incubate for at least 3 h at 37 °C in a humidity chamber. Afterwards the chips were washed 10 min in 0.1 % solution of Triton X-100, followed by 2 min wash in HCl pH 4 and a 10 min washing in a 100 mM solution of KCl. The substrates were then blocked for 15 minutes in a 50 mM solution of ethanolamine with 0.1 % SDS in 0.1 M Tris at pH 9.0. Afterwards the chips were rinsed with distilled water and dried under a stream of nitrogen.