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Synthesis of DNA monolayers on gold and siliceous supports RASTISLAV LEVICKY, GANG SHEN, ZHEN LIU, M.F. ANAND GASPAR, PATRICK JOHNSON, Columbia University — DNA monolayers have been prepared on metal and siliceous supports. Chains ranging in size from oligonucleotides to gene- sized polymers have been site-specifically attached without detectable side reactions, ensuring an end-tethered, "brush" geometry. On gold, DNA monolayers are anchored to nanometer-thin polythiol films which are irreversibly chemisorbed to the gold support to provide excellent stability with minimal damage to the monolayer even under high temperature ($\sim$ 100 C) conditions. The conductive metal supports allow electrical addressing of the DNA layer, a feature useful for electrochemical sensing as well as for physically probing the layer organization. On silica and glass supports, several surface modification strategies have been tested. On both types of support, optimized approaches lead to close to 100% hybridization activity toward complementary sequences when surface densities are sufficiently low to mitigate effects of crowding. The dependence of the cross-over between full and suppressed hybridization regimes on chain length has also been investigated.

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