

Abstract Submitted
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Self assembled silicon nanowire Schottky junction assisted by collagen¹ DIDIER STIEVENARD, IEMN - DptISEN, BILLEL SAHLI, IEMN-Dpt ISEN, YANNICK COFFINIER, RABAH BOUKHERROUB, IRI FRE2963, OLEG MELNYK, IBL UMR8525, IEMN - DPTISEN TEAM, IRI TEAM, IBL TEAM — We present results on self assembled silicon nanowire Schottky junction assisted by collagen fibrous. The collagen is the principle protein of connective human tissues. It presents the double interest to be a low cost biological material with the possibility to be combed as the DNA molecule. First, the collagen was combed on OTS modified surface with gold electrodes. Second, silicon nanowires were grown on silicon substrate by CVD of silane gas (SiH₄) at high temperature (500 ° C) using a vapor-liquid-solid (VLS) process and gold particles as catalysts. In order to increase electrostatic interaction between the collagen and the nanowires, these latters were chemically modified by mercaptopropylmethoxysilane (MPTS), then chemically oxidized. Therefore, the nanowires were transferred from their substrate into water and a drop of it deposited on the surface. Nanowires are only bound to collagen and in particular, in electrode gaps. The formation of spontaneous Schotkty junction is demonstrated by current-voltage characteristics.

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