

Silicon nanowire interface circuit for biosensing applications

ABSTRACT

Detection and quantification of biological and chemical species are critical to many areas of the life sciences and health care, from disease diagnosis to drug screening. Central to detection is the transduction of the signal associated with the sensing event. Advances in nanotechnology have led to the development of the silicon nanowire which is faster, smaller, greener and cheaper. These nanowires have a very narrow diameter similar to that of the chemical and biological species to be sensed making them perfectly suited for biosensing. The top-down fabricated silicon nanowires is used in this work due to its oxide-coated surface and ease of integration with other microelectronic components. Due to the ultra-small output signal of the nanowire, bulky equipments which are often time consuming and expensive are used for reading the signal. This work attempts to build a circuit that can be interfaced with the nanowire to make the signal readable hence the sensor will become portable thereby increasing its utility to being a point-of-care and field-testing device.

Keyword: Amplification; Biosensing; Interface circuit; Silicon nanowire