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Research Highlights

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Nanowires: Plug and play

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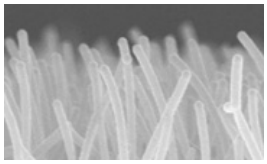
Hybrid core–multishell nanowires are excellent electrical and physical connectors



Plug-and-socket-based electrical connections are a traditional means of delivering power to electronic circuits. However, despite the dramatic downsizing of electronic devices, such conventional electrical connectors cannot be scaled down to submillimetre regimes because the mechanisms for making the electrical and physical connections are not the same. Now, Ali Javey and colleagues at the University of California at Berkeley have devised electrical connectors from hybrid core–multishell nanowire forests in which the electrical and physical contact is made using the same active area[1].

The nanowire connectors consisted of germanium nanowire cores grown on silicon substrates, covered with a 50–300-nm-thick layer of parylene — a hydrophobic polymer — and finally a 45-nm-thick silver shell. The germanium nanowires were several micrometres in length with a density of 10–20 nanowires per micrometre at the substrate surface and 1–2 nanowires per micrometre at the top of the nanowires. The parylene acts to enhance adhesion between interpenetrating nanowire arrays, and the silver shell is necessary for electrical connect.

The nanowire electrical connectors were successfully used to connect a light-emitting-diode array to a wall-mounted battery array.

Reference

1. Kapadia, R. *et al*. Hybrid core–multishell nanowire forests for electrical connector applications. *Appl. Phys. Lett.* **94**, 263110 (2009). | Article | ChemPort |

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