Functionalized PANI network conductor towards future computation

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The memristive resistor has been a long time candidate for the artificial neural network as it has similar short-term plasticity and long-term potentiation as neuro synapse[1]. Recent works on resistive switching access memory[2] give the confidence to achieve computation on the memristive device. Most efforts have been worked on regular resistor network which needs complex lithographic technology[2]. Here we propose a simple approach with functionalized polyaniline complex network. PANI is a widely used conductive polymer which is flexible and stable in the air but does not have switching behavior. 1/f noise measurement shows PANI network has scale-free feature, which has also been found in our brain[3]. We firstly functionalized PANI with gold nanoparticles(GNP) to form GNP/PANI fibers. GNP/PANI film has been proved to have bistable switching behavior. Our I-V measurement on GNP/PANI nanofibers shows similar bistable switch behavior. Test of the memristive efficiency on our complex network is on the going.

References:

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