Graphene Oxide-Based Circulating Tumor Cell Capture Device

Technology #5137

Background
The quantification of circulating tumor cells (CTC) present in the blood stream of metastatic cancer patients is a valuable tool for the early detection of the disease, its staging, as well as for the assessment of the patient’s response to their individual anti-cancer therapy. However, the process of quantitating CTCs is extremely challenging given the scarcity of these cells (1 for every ~ billion red blood cells). This makes the currently available assays and methods not sufficiently reliable and specific when it comes to early-stage CTC detection and precise quantitation.

Technology
Researchers at the University of Michigan have built upon previous technology – a microfluidic approach for CTC isolation and capture – and have demonstrated a highly reliable lab-on-a-chip CTC capture device. This microfluidics device utilizes the self-assembly of graphene oxide in a unique way in order to enhance the sensitivity and specificity of detection, making it very valuable tool for early-stage detection of metastatic cancer. In addition, this device can be used to obtain highly accurate readings of a patient CTC counts in order to optimize the patient’s individualized anti-cancer therapy.

Applications and Advantages

Applications
- Early detection of metastatic cancer diseases.
- Monitoring of patient’s response to anti-cancer therapies.
- High-sensitivity and specificity tumor cell capture and isolation device.

Advantages
- Device fabrication is compatible with standard microelectronics and microfluidics technologies.
- Offers higher sensitivity and specificity over current options.

Inventors
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