Patient-specific aptamer generation for sensitive and noninvasive diagnosis of minimal residual disease

Technology #cu15020

This technology is a microfluidic device that generates aptamers for individualized detection of minimal residual disease (MRD).

Unmet Need: Patient-specific detection of minimal residual disease biomarkers

Minimal residual disease (MRD) is a leading complication of multiple myeloma, in which small amounts of cancerous cells remain after standard chemotherapy, resulting in relapse and often death. However, methods to detect minimal residual disease (MRD) are often invasive or give frequent false negatives. As such, there is a need for a simple, noninvasive method that detects patient-specific biomarkers of minimal residual disease to improve patient outcomes and survival.

The Technology: Automated microfluidic platform allows for rapid and low-cost generation of personalized aptamers

This technology generates aptamers for individual patients using an integrated microfluidic device. Patient-specific aptamers against minimal residual disease biomarkers (M-proteins) are produced automatically within the device, which can then be isolated and used after treatment to monitor M-protein levels in blood. As such, this technology therefore enables timely and noninvasive detection of MRD and multiple myeloma relapse. This technology offers a low-cost, precision-medicine approach to multiple myeloma care, potentially leading to a major improvement in clinical outcomes.

A prototype of this technology has been demonstrated to generate aptamers against proteins purified from patient serum that display exceptional target selectivity and sensitivity.
**Applications:**

- Generation of personalized aptamers that detect the presence of M-proteins and MRD
- Generation of aptamers against other biomarkers of disease, particularly other blood cancers
- Diagnostic tool for point-of-care treatment
- Platform for personalized diagnostics

**Advantages:**

- Highly sensitive and specific technique for MRD detection and diagnosis
- Noninvasive diagnostic method, requires only a blood draw
- Low-cost diagnostic tool
- Can be used for frequent screening (e.g., every 2-4 weeks) and early detection of cancer relapse

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**Patent Information:**

Patent Pending (US 20170130218)

**Related Publications:**


**Tech Ventures Reference:**

- IR CU15020
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