

Activity-based synthetic liquid biopsy of solid tumors

Methods for monitoring tumors can be invasive and ineffective

Current tumor monitoring methods is their reliance on invasive biopsies, often failing to provide continuous, real-time data on tumor activity and therapeutic response. Existing liquid biopsies also suffer from low sensitivity due to the dilution of biomarkers in blood.

This new invention addresses these issues by utilizing activatable biosensors injected directly into tumors. These biosensors capture dynamic biological activity and immune responses, reporting specific protease activity through detectable molecules in bodily fluids like urine and blood. This method offers non-invasive, highly sensitive monitoring of tumor environments and treatment effectiveness, providing continuous, real-time insights into tumor behavior.

Activatable biosensors capture dynamic biological activity

Utilizing activatable biosensors injected directly into tumors, this invention captures dynamic biological activity and immune responses within solid tumors. These biosensors, designed to report on specific protease activity, allow for the non-invasive monitoring of tumor responses to therapies through the detection of reporter molecules in bodily fluids such as urine and blood. This method offers a less invasive alternative to traditional biopsies, providing real-time insights into tumor behavior and the effectiveness of treatments.

Summary Bullets

- Activatable biosensors injected into tumors capture dynamic biological activity and immune responses, allowing non-invasive monitoring of tumor responses through bodily fluids.
- The prototype offers real-time insights into tumor behavior and treatment effectiveness, providing a less invasive alternative to traditional biopsies.
- This method enhances sensitivity and specificity for tumor-specific biomarkers, improving monitoring of drug responses and cancer progression.

Solution Advantages

- Non-invasive monitoring
- Improved detection limits over current technologies.
- Enhanced sensitivity and specificity for tumor-specific biomarkers.
- Monitor dynamic changes in the tumor microenvironment over time.

Potential Commercial Applications

- Drug response monitoring in cancer treatments, particularly for immunotherapies.
- Therapeutic response monitoring across multiple immune cell types within tumor microenvironments.
- Potential for early detection and monitoring of cancer progression through non-invasive means.

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IP Status

<p>The patent application has filed</p>:

Publications

[Synthetic biomarkers: a twenty-first century path to early cancer detection](#), Nature Reviews Cancer - 2021

Images

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<https://s3.sandbox.research.gatech.edu//print/pdf/node/4333>