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Protein-protein Interaction Measurement by Particle Diffusometry in a Low-volume Chip

Microfluidic chip that reduces sample waste while characterizing protein interactions for diagnostics.

Researchers at Purdue University have developed a microfluidic chip that reduces the amount of dead volume solution (solution that remains in the needle after an injection) used in disease diagnostics. Samples often are primed with a set amount of extra solution before injection to ensure stability, consistency, and lack of air bubbles when working with small amounts of liquid. This leads to excess solution remaining after injection that cannot be reused, known as dead volume. Purdue researchers developed an injection technology that produces less dead volume than standard. Through particle diffusometry, an optical detection method to analyze fluid properties by quantifying the Brownian motion of tracer particles suspended in a solution, researchers studied how measured/limited dispenses from the chip affected protein binding rate and solution viscosity, which were enough to characterize/identify the human immunodeficiency virus (HIV) even before it spreads in the body.

Technology Validation: Measured/limited dispenses from the microfluidic chip affected protein binding rate and solution viscosity just as effectively as other injection technologies.

Advantages

-Economic

-Efficient

-Resourceful

-Less waste

Applications

-Biomolecular interaction analysis

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Category
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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View online

-Disease diagnostics

-Vaccination delivery

TRL: 4

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