

The Vertical Comet: A Novel Electrophoresis Assay



BACKGROUND

Comet assays are a gel electrophoresis-based method that can be used to measure DNA damage in individual cells. Using standard gel electrophoresis techniques, it can take hours to prepare, process, and analyze even a single sample of a comet assay. Furthermore, current assays lack standardization that may lead to undesirable variability not only from laboratory-to-laboratory but from user-to-user and slide-to-slide.

DESCRIPTION

Whereas the traditional comet assay is effectively two-dimensional, pulling DNA with electrostatic force along the face of a matrix layer (e.g., an agar gel layer), which can be subsequently imaged for analysis, the vertical comet assay runs an electric field through the two-dimensional plane of the matrix layer, pulling damaged DNA out of the matrix layer and into a fluid buffer. The damaged portions of the cells within the fluid buffer can be quantified, analyzed, or otherwise processed to provide an objective quantitative value and/or to determine a gene sequence of the cells. This process can greatly reduce variation in analysis while also reducing the time and cost.

ADVANTAGES

- Sensitive, efficient, consistent, and reliable electrophoresis for analyzing damage to cells and DNA
- Reduced time and cost with improved standardization
- Damaged cells can be quantified
- Captured DNA can be analyzed via PCR and sequencing

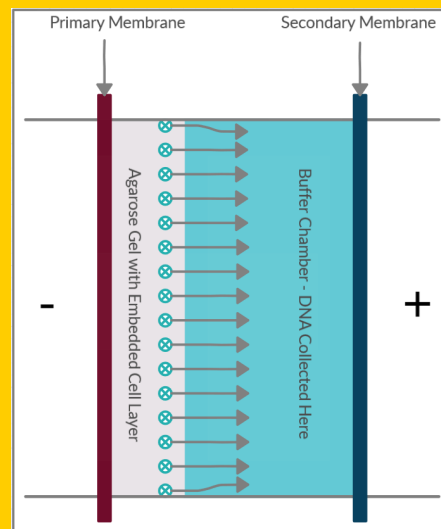
APPLICATIONS

- Clinical diagnostics
- Assessment of DNA damage and/or repair
- Biopsy analysis

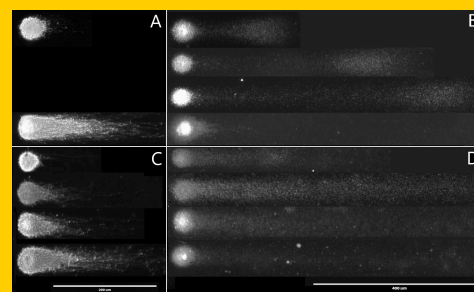
PATENT STATUS

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Basic vertical comet process.



Comparison to traditional comet assay.

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