



Office of Technology Management

A Novel Method of Cancer Detection

Technology Reference

CW058 & CW059

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Field

Cytology
Pathology

Key Words

Cancer Detection
Extracellular Matrix
Cell Morphology
Invasive Potential
Metastasis

License Status

Seeking licensing partner

Patent Status

Provisional application filed

Overview

It is well documented that interactions between cells and the extra cellular matrix have a strong and sometimes controlling influence on cell morphology and cell function. Cell-matrix interactions can “switch” a cell between growth and differentiation phases or between invasive and non-invasive phases.

Certain cell growth morphologies can be correlated with disease states. This is characterized by a “looping” pattern in tumor biopsy specimens, which indicates highly invasive, drug resistant cancer. This invention links these two classes of observations in a manner that has both diagnostic and predictive value.

Technical Summary

This invention consists of a device and methods for the detection, classification and staging of cancers based upon the distinctive patterns exhibited by cells when grown on extra cellular matrix proteins. These patterns may further be used to predict sites to which a cancer may preferentially metastasize. These methods also have utility in the screening of chemical entities to retard, promote, or regulate cancer activities and can also be used for determining if this activity is exerted on the cell nucleus or cytoplasm.

Benefits

- Objective and quantitative
- Prognostic and diagnostic
- Automatable and adaptable to HTS
- Applicable to a broad scope of cancers

Areas of Application

- In-vitro diagnostic (IVD)
- Drug discovery
- Personalized medicine

Publication

- Maniotis, A., C.S. Chen and D.E. Ingber. 1997. Demonstration of mechanical connections between integrins, cytoskeletal filaments and nucleoplasm that stabilize nuclear structure. Proc. Natl. Acad. Sci. USA, Vol. 94, pp. 849-854.
- Maniotis, A., et. al.. 2002. Control of melanoma morphogenesis, endothelial survival and perfusion by extracellular matrix. . Laboratory Investigation. Vol. 82, pp. 1031-1043.
- Maniotis, A., et. al.. 2003. Cytoplasmic and extracellular matrix control of DNA sequestration and exposure. In Preparation.

Stage of Development

- Demonstrated with cultured cell lines and patient specimens.