

InvenioIP - Technology Details

Institution: University of Maryland, Baltimore

Docket: FJ-2006-039


Title: A Novel in situ DNA diagnostic Chip

Summary: The present invention relates to a non-invasive, inexpensive, reliable and highly sensitive molecular diagnostic tool for early detection and diagnosis of diseases with genetic aberrations. Combining the principles of in-situ hybridization with array techniques, the in situ genomic DNA chip consists of multiple specific probes to detect a panel of unique genetic aberrations directly on the clinical specimen.

- Applications:**
- Early detection, diagnosis and prognosis of diseases.
 - Monitoring patients for response of treatment.
 - Staging and postoperative surveillance of disease.
 - Chemopreventive interventions.
 - Performing large-scale population-based molecular epidemiologic studies.
 - Potential use in personalized treatment.
- Advantages:**
- Offers an accurate diagnosis for heterogeneous diseases i.e. diseases where a single biomarker is not sufficient to predict a clinically significant phenotype.
 - Simultaneous analysis of 16 genetic probes.
 - Can be used directly on clinical specimens.
 - Can even detect small population of abnormal cells in a sample.
 - Provides early tumor diagnosis.
 - Provides an automated genetic test that is fast, less laborious and quantitative.
 - Applicable for small sample size.
- State of Development:**
- Proof of concept demonstrated in tumor tissues, sputum and bronchial washings from lung cancer patients. Correlative studies demonstrate that this technology not only overcomes the limitation of the commercial LAVision assay but it is more efficient and sensitive diagnostic tool than any other existing methods for detection of lung cancer. Studies ongoing to extend the use of the chip to different types of tumors for diagnosis, for example pancreatic cancer.
- R and D Required:**
- Validate the technology in the other diseases with genetic aberrations./li>
- Licensing Potential:**
- UM seeks to develop and commercialize via an exclusive or non-exclusive license agreement./li>
- Patent Status:**
- US Patent Application [11/641,008](#) Pending, Filed December 19, 2006.

**Related
Publications:**

- Jiang F *et al.* [Combined genetic analysis of sputum and computed tomography for noninvasive diagnosis of non-small-cell lung cancer.](#) Lung Cancer. 2009 Oct;66(1):58-63.
- Yendamuri S, *et al.* [3p22.1 and 10q22.3 deletions detected by fluorescence in situ hybridization \(FISH\): a potential new tool for early detection of non-small cell lung Cancer \(NSCLC\).](#) J Thorac Oncol. 2008 Sep;3(9):979-84
- Katz RL, *et al.* [Automated detection of genetic abnormalities combined with cytology in sputum is a sensitive predictor of lung cancer.](#) Mod Pathol. 2008 Aug;21(8):950-60. Epub 2008 May 23. Erratum in: Mod Pathol. 2008 Aug;21(8):1065.
- Jiang Z, *et al.* [Detecting genomic aberrations by fluorescence in situ hybridization with quantum dots-labeled probes.](#) J Nanosci Nanotechnol. 2007 Dec;7(12):4254-9.
- Li R, *et al.* [Genetic deletions in sputum as diagnostic markers for early detection of stage I non-small cell lung cancer.](#) Clin Cancer Res. 2007 Jan 15;13(2 Pt 1):482-7.

- Files:**  [Published Patent](#)
 [Katz et al. 2008](#)
 [Fan et al. 2007](#)
 [Li et al. 2007](#)

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