

Abstract MP22-12

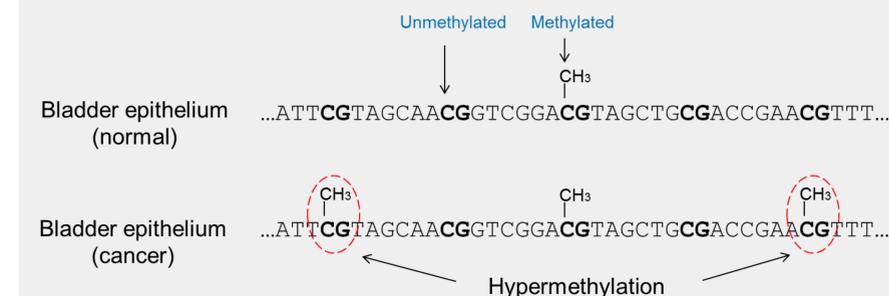
DNA methylation-based urine assay for detection and monitoring of bladder cancer

Jacob Ramon^{(1)*}, Zohar Dotan⁽¹⁾, Abed Elhalim Darawsha⁽²⁾, Ilan Leibovitch⁽²⁾

⁽¹⁾ Dept. of Urology, Sheba Medical Center, Israel ⁽²⁾ Dept. of Urology, Meir Medical Center, Israel

Introduction and Objectives

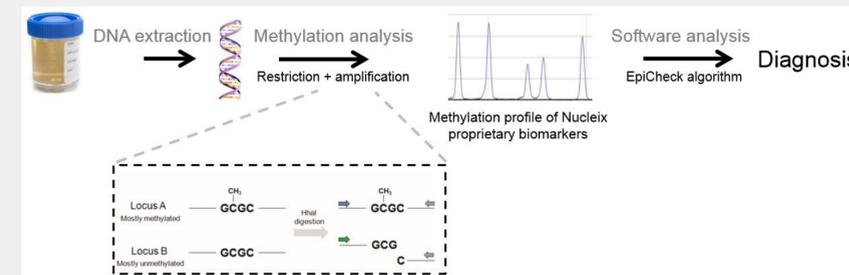
- Due to Urine Cytology's low sensitivity, several alternative molecular assays were previously developed, however, they failed to reach high sensitivity and/or specificity and therefore were not widely used.
- A new approach for cancer detection in urine samples was developed based on detection of hypermethylation of tumor suppressor genes and other genomic loci, which occurs in all bladder carcinomas, as well as in all other types of cancers.
- Nucleix Bladder EpiCheck utilizes "MethylPrecise" technology, to produce a DNA methylation "fingerprint" for urine, thereby detecting cancer-related hypermethylation.



Methods

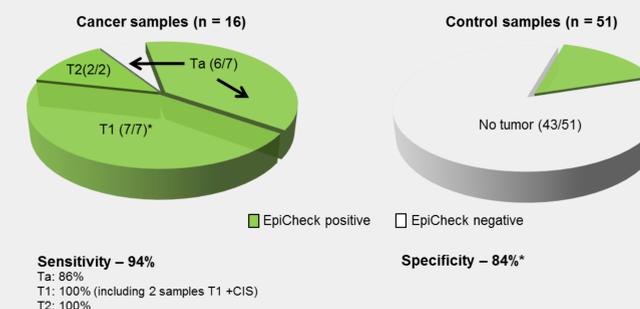
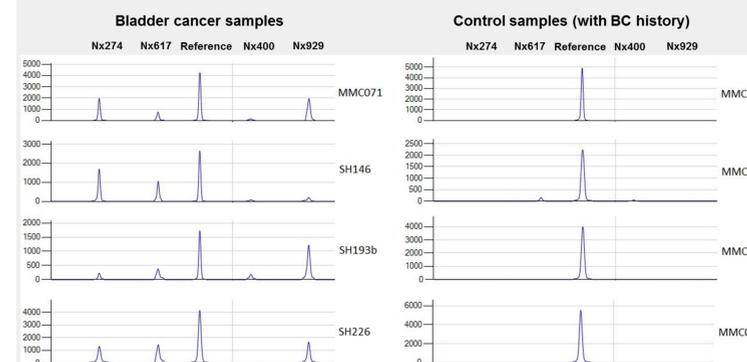
- The assay utilizes methylation-sensitive restriction of DNA followed by quantitative amplification of 15 genomic loci that are hyper-methylated in bladder cancer.
- Automatic software analysis outputs the diagnosis and provides a quantitative EpiScore – reflecting the sample's methylation level.

Procedure:



Results

- After freezing of assay parameters it was tested on a "fresh batch" of 67 samples of patients with history of bladder cancer, the assay detected 94% (including all high grade) tumors at 84% specificity.
- An alternative cut-off value, results in 81% sensitivity and 96% specificity.



Discussion

- This assay represents a type of "molecular cytology", relying not on cellular morphology, but rather on molecular changes, for detection of cancer
- Molecular cytology has the following advantages:
 - High sensitivity due to the ability to detect subtle and early changes at the molecular level that are present in morphologically normal cells
 - A DNA based assay does not require the presence of intact cells
 - Completely automatic procedure resulting in a user-independent assay, that is objective and repeatable
 - The quantitative EpiScore result provides a measure of the patient's methylation that can be monitored over time.
- Molecular diagnosis approach is applicable to all cancer types and could potentially be used for detection as well as for staging and risk assessment

Conclusion

- **Nucleix Bladder EpiCheck is a powerful new non-invasive tool for bladder cancer detection and monitoring.**