Better differentiating aggressive from non-aggressive prostate cancer using MiCheck®

Neal D. Shore[1*], Daniel R. Saltzstein[1], Marc Pliskin[1], Richard E. D'Anna[1], Eugene V. Kramolowsky II[1], Christopher M. Pieczonka[1], Jennifer Beebe-Dimmer[2], Julie J. Ruterbusch[2], Robert Borotkanics[4], Phillip Prah[4], Rachel Levin[3], Sandra Wissmueller[3], Thao Ho-Le[3], Douglas H. Campbell[3], and **Bradley J. Walsh[3]**

[1]CUSP Clinical Research Consortium, [2]Barbara Ann Karmanos Cancer Institute and Wayne State University School of Medicine Department of Oncology, [3]Minomic International Ltd, [4]Auckland University of Technology

BACKGROUND: A more accurate diagnostic test is still needed to enhance physician-patient decision-making regarding the need for a prostate biopsy, in conjunction with Prostate Specific Antigen (PSA) kinetics and/or the digital rectal examination (DRE). The MiCheck® test is a triage test to assist clinicians and patients in the decision to proceed to prostate biopsy. MiCheck® is a blood test which measures multiple cancer related proteins while combining this information with both serum PSA and other clinical factors.

The trial had two arms: Arm 1 (normal patients, n=52) and Arm 2 (prostate biopsy patients, n = 332). Full inclusion and exclusion criteria will be presented at the meeting. The MiCheck® test was performed on all patient samples and multiple blood analytes measured. An algorithm was then applied to determine how well the test can differentiate between aggressive and nonaggressive cancer.

METHODS AND MATERIALS:
MiCheck® test kits were supplied by BioTechne (Minneapolis, MN). Serum samples (50 ul) were tested according to the manufacturer's instructions. Mean fluorescence intensities were converted to concentration using standard curves and results used to produce an optimal algorithm for differentiating aggressive and non-aggressive cancer. All subject biopsies additionally underwent central pathology review and centralized PSA. Arm 2 patients additionally underwent PHI and % free PSA measurement to allow a head-to-head comparison of the three tests.

RESULTS:
Samples were collected from 12 US Urology Community Centers. In addition to PSA, family history, demographic information and other clinical factors were collected. Of the 332 Arm 2 (prostate biopsy) patients, 184 patients were positive for (CaP), 64 had non-aggressive CaP (ISUP GG 1) and 120 had aggressive CaP (ISUP GG 2 or greater). Logistic regression algorithms were utilized to differentiate aggressive from non-aggressive cancer which were derived using a combination of clinical factors and soluble analyte values.

The best performing MiCheck® test algorithm demonstrated an AUC of 0.83 with a sensitivity of 96% and a specificity of 36%, differentiating aggressive from non-aggressive CaP.

318 samples from Arm 2 were assessed using the PHI and % free PSA tests. The PHI and % free PSA showed AUCs of 0.54 and 0.69 respectively when differentiating between aggressive from non-aggressive CaP.

DISCUSSION AND CONCLUSIONS:
The MiCheck® test demonstrates an enhanced ability for discriminating aggressive from non-aggressive CaP. The test also demonstrates superior performance to either the PHI test or % free PSA in this patient cohort. Use of the MiCheck® test would assist clinicians and patients in assessing the need for a prostate biopsy.

CONFLICT OF INTEREST:
None of the authors have any potential conflicts to disclose.

FUNDING ACKNOWLEDGMENTS:
Funding for the present work was provided by Minomic International Ltd.