**Evaluation of 3 different scanners’ performance in creating images suitable for INIFY Prostate® to accurately predict suspicious cancer areas in prostate biopsies**

**Background**
Prostate cancer is one of the most common cancer in men. Artificial intelligence algorithms can be used to facilitate its diagnosis and improve objectivity. These algorithms are dependent on high-quality Whole Slide Images (WSIs). This study evaluates prostate biopsy WSIs acquired on three different scanners by using an algorithm (INIFY Prostate®) outlining suspicious cancer areas.

**Methods**
- 15 independent slides from Tufts (5 benign - 10 cancer)
- 15 independent slides from Weaner (5 benign - 10 cancer)
- Slide scanning at Weaner, Aperio, Hamamatsu, Philips resulting in 90 WSIs
- INIFY predicts suspicious cancer areas and tumor volume (% area of biopsy involved)
- Evaluation of false negative & false positive algorithm annotations on all 90 WSIs in INIFY viewer by Tufts pathologist
- Data evaluation algorithm performance calculated as sensitivity and specificity

**Figure 3:** For all scanners (left Aperio, middle Hamamatsu, right Philips), the % suspicious cancer area predicted by the INIFY Prostate® algorithm was very similar and strongly correlated with the pathologists estimated cancer length.

**Table 1:** Meta-analysis of false negative algorithm annotations. No differences between scanners were identified (within one standard deviation).

**Table 2:** Meta-analysis of false positive algorithm annotations. No differences between scanners were identified (within one standard deviation).

**Conclusions**
INIFY Prostate® predictions on WSIs scanned on Aperio, Philips and Hamamatsu show excellent correlation in diagnostic accuracy and tumor volume estimation, with sensitivity of 100% for small focus cancer (<1mm), Specificity is high. No differences between scanners were identified. To our knowledge, this is the first quality assurance study comparing the performance of a prostate algorithm on images from three different scanners. Such studies will be important as pathologists move forward with implementing AI algorithms for routine sign-out workflows.

**Figure 4:** Evaluation metrics:
- Sensitivity = TP/(TP + FN) × 100%
- Specificity = TN/(TN + FP) × 100%

**Figure 2:** INIFY Prostate® viewer: graphical user interface where the pathologist can view, measure, outline, and zoom the digital images.

**Figure 1:** Study conduct.

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