Introduction:
- Systematic biopsy (SB) has been performed concurrently with MRI-targeted biopsy (TB).
- Although the addition of SB to TB has been reported to improve the detection of significant cancer (SC), SB is not designed for supplements to TB.
- We investigated the distance of each SB core from targets and its impact on SC detection to establish an optimal sampling which supports TB.

Patients & Methods:
- 285 cT2 men who had PIRADS ≥ 3 lesions on multiparametric MRI underwent transrectal TB and 12-core SB
- A single reader reviewed MRI according to PIRADSv2 and delineated PIRADS ≥ 3 lesions along their margin.
- TB and SB were performed by using an MRI-ultrasound fusion system (UroNav/Invivo).
- Trajectories of needle cores were tracked and transposed to MRI data. Among SB cores harboring SC, the distance between each core and targets ("core-target distance") were measured (see Measurement of distance between cores and targets).
- The relation between the core-target distance and SC detection was analyzed. Volume of regions which needed to be assessed by biopsy was also examined.
- SC was defined as cancers with Grade group ≥ 2

Results:
- Among 169 SC men detected by combination of SB and TB, SB detected SC in 123 men (73%), TB detected SC in 149 men (88%), respectively.
- Of the 123 SC men detected by SB, 102 men (83%) were detected by cores which were inside-target or within 5mm from targets.
- Addition of sampling 5mm around target to TB could identify 98% of SC patients detected by combination biopsy, and the volume of regions to be sampled was 16% of total prostate volume in median.

Conclusions:
98% of SC patients detected by the combination of TB and SB were identified when SB cores > 5mm apart from targets were omitted.