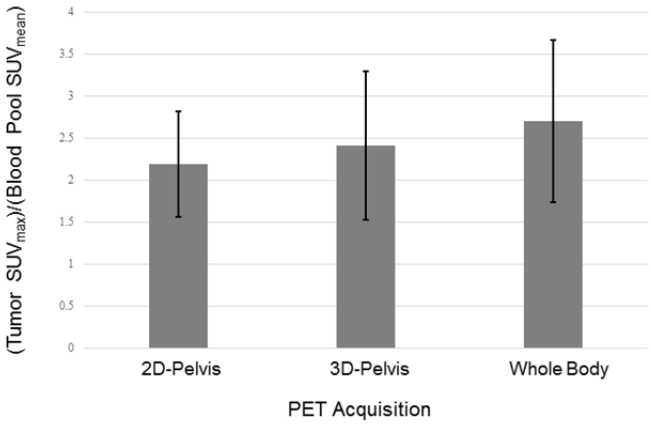
Supplemental Results

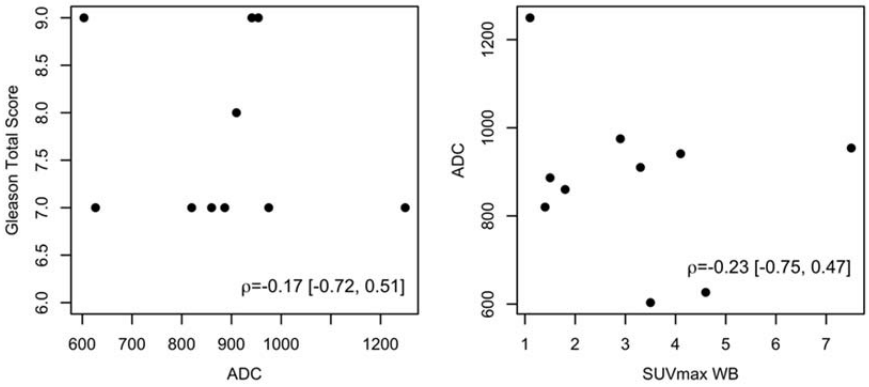
ADC values have previously been described as an MR imaging biomarker that can report on the aggressiveness of prostate cancer, with lower ADC values corresponding to higher Gleason grade (*4, 5*). We observed a weakly negative relationship between Gleason score and ADC values in our study (Supplemental Figure 2). The weakness of the correlation may simply reflect clustering effects from the relatively small number of patients included. We also found a weak negative correlation between tumor SUV_{max} and ADC values (Supplemental Figure 2), which was not unexpected given the positive correlation between SUV_{max} and Gleason score and the weak negative correlation between ADC values and Gleason score.

Based on our supposition that DCFBC uptake in tumors is driven by binding to PSMA, we expected there to be a relationship between tumor SUV_{max} and the amount of PSMA staining by IHC on the pathologic specimens. Along those lines, we did not expect SUV to be correlated to other markers of prostate cancer or cell proliferation (ERG and Ki-67). Indeed, when correlating SUV_{max} to PSMA H-score, PSMA H-$score_{mod\text{-}str}$, and PSMA H-$score_{str}$, positive relationships were noted for all three (Supplemental Figure 3, ρ values between 0.31 and 0.51), though none of them reached statistical significance. In regards to non-PSMA IHC findings, we observed a positive correlation between PSA H-score and SUV_{max} (Supplemental Figure 3). It was difficult to draw any conclusions regarding correlation of DCFBC PET SUV_{max} with ERG H-score (ρ -0.31), with a negative relationship, as only two of thirteen tumors demonstrated any significant ERG staining (Supplemental Figure 3). A similar weak negative correlation was observed between Ki-67 staining and SUV_{max} (ρ -0.28) (Supplemental Figure 3). Those parameters showed negligible to weak correlation with ADC values (PSA, ERG, and Ki-67 with ρ of -0.01, -0.11, and -0.22, respectively). We had expected that adding an additional correction

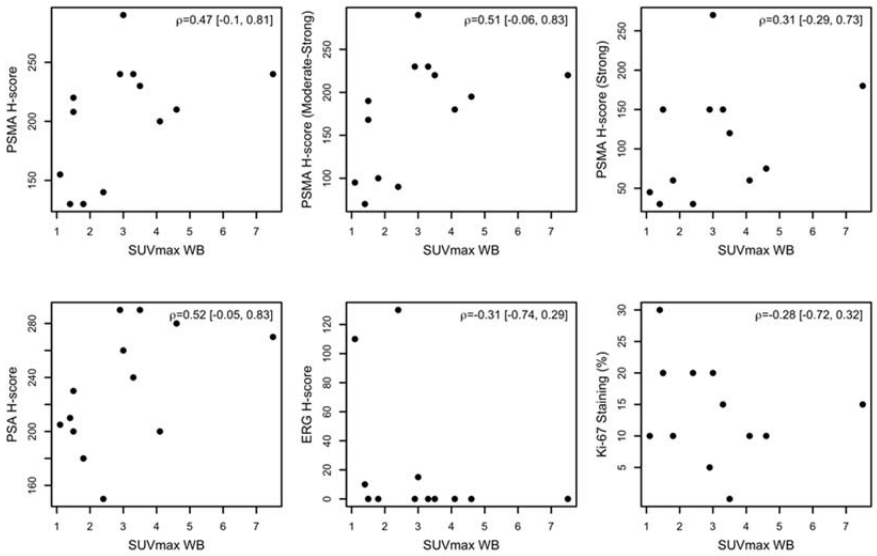
factor for tumor size to the H-score would improve the positive correlations; however, this was not the case. The correlations between SUV_{max} and PSMA [H-score x volume], PSMA [H-$score_{mod\text{-}str}$ x volume], and PSMA [H-$score_{str}$ x volume] were found to be weak to negligible with ρ values of 0.18, 0.20, and 0.13, respectively. That is consistent with the results presented in Table 3 in which nodule size was not solely predictive of DCFBC uptake. Weak to negligible negative correlations were observed for MRI ADC values relative to the PSMA H-score and [H-score x volume] metrics with ρ values of -0.19 and -0.08, respectively.



Supplemental Figure 1 – Average prostate tumor to blood pool ratio (Tumor SUV_{max}/Blood Pool SUV_{mean}) for positive prostate lesions at various PET acquisitions, with standard-deviation error bars.



Supplemental Figure 2 – Scatter plot of (A) MRI ACD value with prostatectomy Gleason score showing a weak positive correlation and (B) WB PET positive SUV_{max} with MRI ADV value showing no correlation.



Supplemental Figure 3 – Scatter plot and correlation coefficients correlating PET positive SUV_{max} to various corresponding tumor IHC markers. (A) PSMA H-score (mild, moderate, strong), (B) PSMA H-score (moderate and strong), (C) PSMA H-score (strong only), (D) PSA, (E) ERG, and (F) Ki-67.