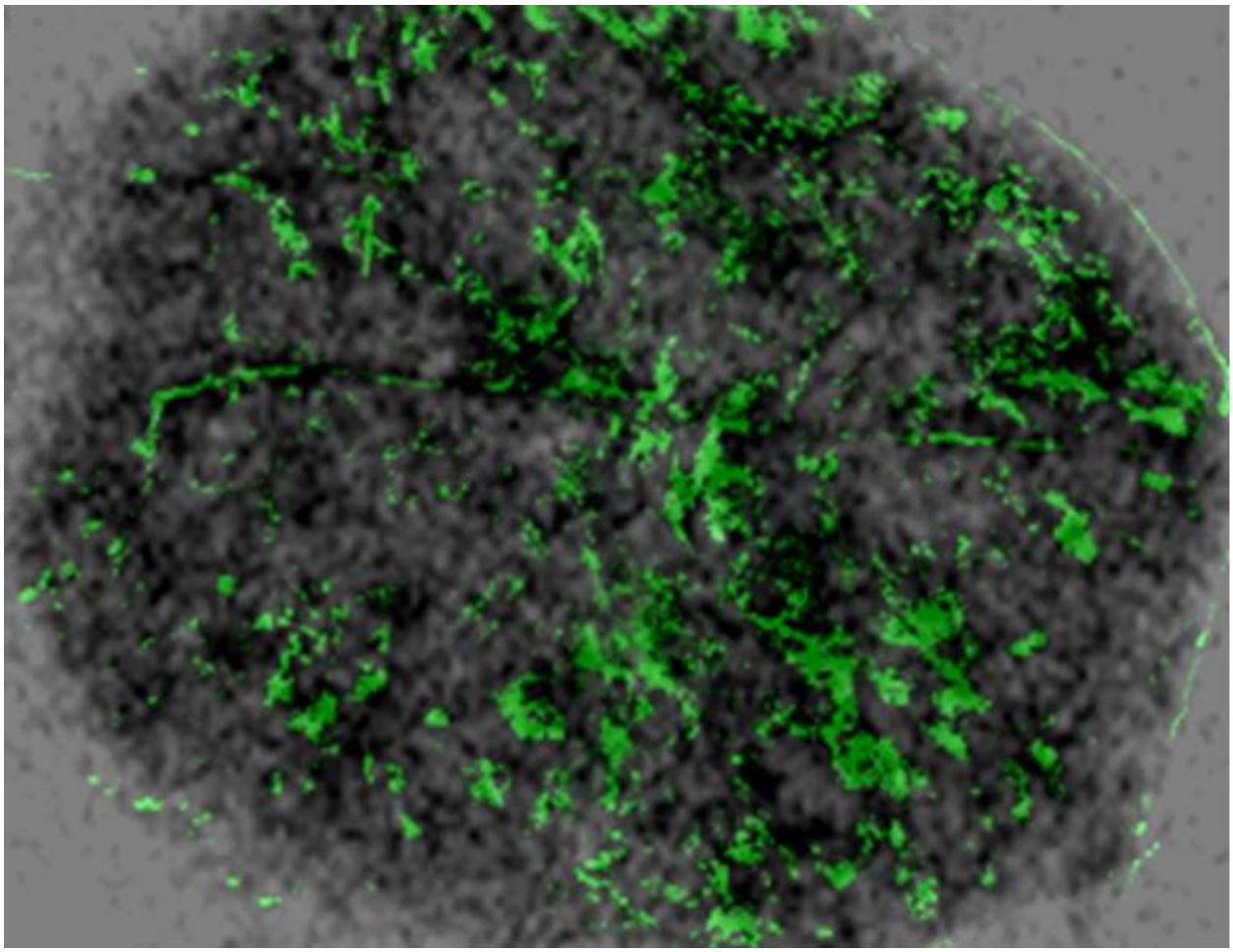
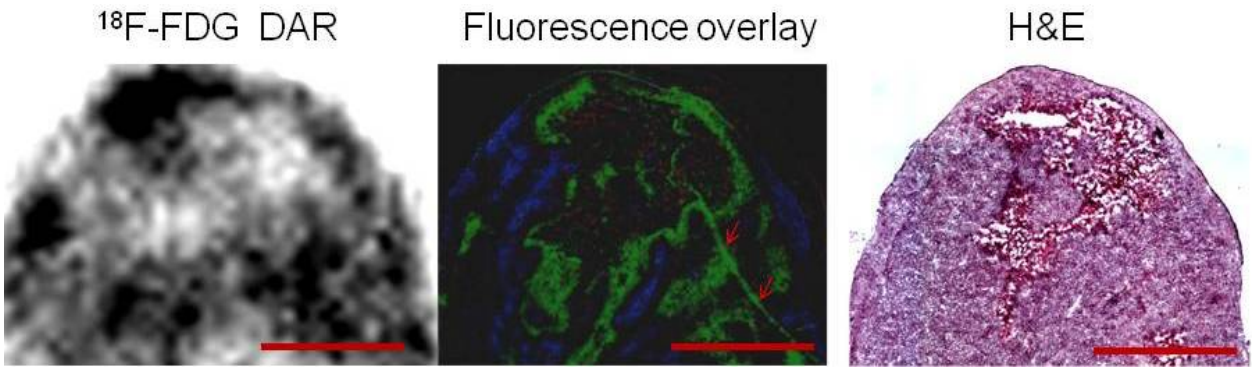


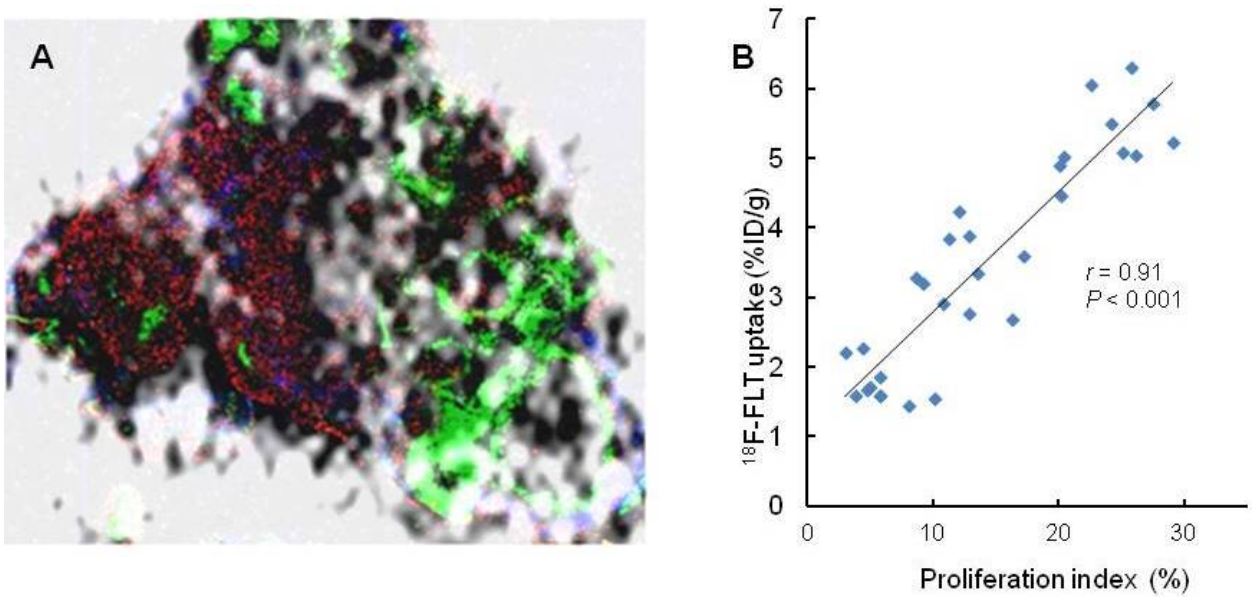
Supplemental Figure 1

The overlaid image of ^{18}F-FDG autoradiography and pimonidazole immunohistochemical staining (green) from an HTB177 subcutaneous xenograft section presented in Figure 2.



Supplemental Figure 2

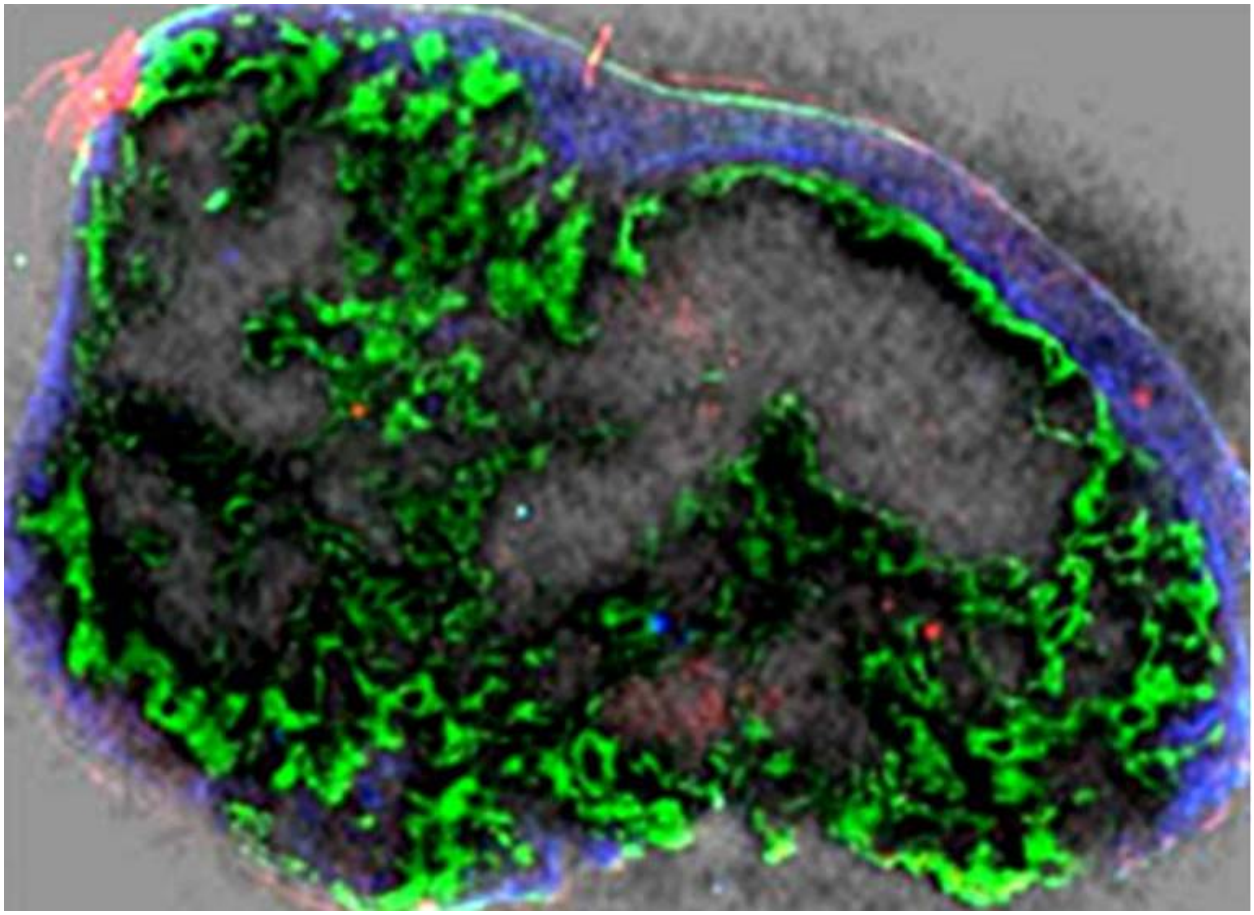
Relationship between ^{18}F-FDG uptake and hypoxia, proliferation and blood perfusion in a HTB177 peritoneal tumor. High ^{18}F-FDG uptake detected by digital autoradiography (DAR) is found in hypoxic (pimonidazole positive, green) but lowly proliferating (bromodeoxyuridine negative) cancer cells. Non-hypoxic and proliferative cancer cells (bromodeoxyuridine positive, red) which are well perfused (Hoechst positive, blue), have low ^{18}F-FDG uptake. Stroma and necrotic zones associate with low ^{18}F-FDG activity. H&E from an adjacent section provided for reference. The red arrows denote a region of nonspecific binding of anti-pimonidazole antibody. All scale bars = 1 mm.



Supplemental Figure 3

A. The overlaid image of ^{18}F-FLT autoradiography and merged immunohistochemical staining of bromodeoxyuridine (red), pimonidazole (green) and Hoechst (blue) in a section of HTB177 peritoneal tumors, presented in Figure 3.

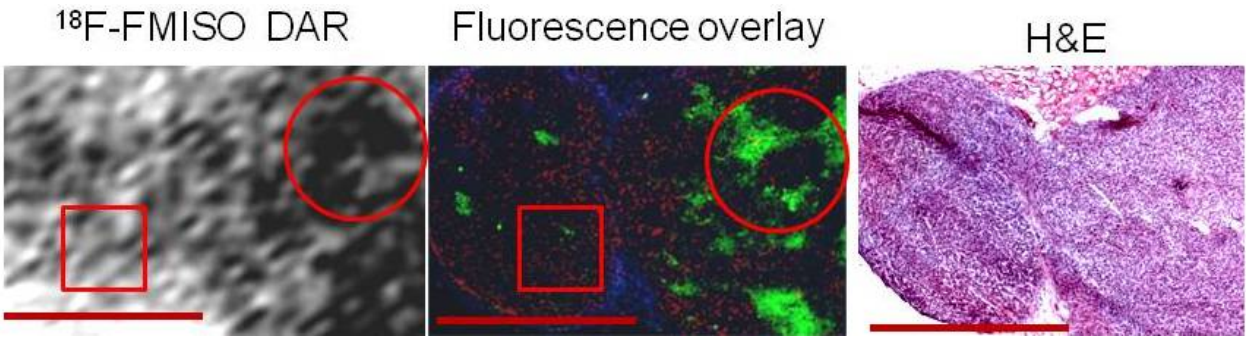
B. Correlation between bromodeoxyuridine defined proliferative index and ^{18}F-FLT, r = 0.91, $P < 0.001$.



Supplemental Figure 4

A. The overlaid image of ^{18}F-FMISO digital autoradiography and merged immunohistochemical staining of bromodeoxyuridine (red), pimonidazole (green) and Hoechst (blue) in the section of an A549 subcutaneous xenograft, which is presented in Figure 4.

B. Relationship between ^{18}F-FMISO uptake and hypoxia, proliferation and blood perfusion in A549 peritoneal tumors. High ^{18}F- FMISO uptake closely associates with hypoxic [pimonidazole (green) positive] cancer cells (circle). Non-hypoxic cancer cells are proliferative [bromodeoxyuridine (red) positive], well perfused (Hoechst positive, blue) (square), and have low ^{18}F-FMISO uptake. Stroma and necrotic zones associate with low ^{18}F-FMISO activity. H&E from adjacent section provided for reference. All scale bars = 1mm.



Supplemental Figure 5

Relative ^{18}F-FDG, ^{18}F-FLT and ^{18}F-FMISO uptake (%) to the maximal %ID/g of each tracer; relative uptake was compared between hypoxic and non-hypoxic cancer cells. ** $P < 0.001$.