Supplementary Table 1: Patient characteristics. A two-way ANOVA with Tukey’s test for multiple comparisons was used to compare variables across each cancer type. Significance is stated as p<0.05.

|                  | Breast Cancer | HNSCC | STS     | NSCLC   | All Cancers |
|------------------|---------------|-------|---------|---------|-------------|
|                  | Female | Male | All | Female | Male | All | Female | Male | All | Female | Male | All | Female | Male | All |
| **Sample Size**  |       |       |     |       |       |     |       |       |     |       |       |     |       |       |     |
|                  | 39     | N/A  | 39  | 7.0    | 34    | 41  | 27     | 24    | 51  | 24     | 33    | 57  | 97     | 91    | 188 |
| **Age (yrs)**    | N/A    | N/A  | N/A | 48.6 ± 15.5 | 57.8 ± 7.6 | 56.2 ± 9.8 | 54.4 ± 19.7 | 55.3 ± 13.7 | 54.8 ± 17.0 | 25.7 ± 4.4 | 27.4 ± 4.8 | 26.7 ± 4.7 | 27.6 ± 5.5 | 27.8 ± 4.7 | 27.68 ± 5.1 |
| **BMI (kg/m2)**  | N/A    | N/A  | N/A | 30.7 ± 10.4 | 27.7 ± 3.6 | 28.2 ± 5.3 | 27.5 ± 5.0 | 28.5 ± 5.9 | 28.0 ± 5.4 | 65.9 ± 11.0 | 83.6 ± 16.2 | 76.2 ± 16.7 | 72.7 ± 15.6 | 84.7 ± 15.8 | 78.5 ± 16.8 |
| **Weight (kg)**  | 28.2 ± 5.0 | 28.2 ± 5.0 | 30.7 ± 10.4 | 27.7 ± 3.6 | 28.2 ± 5.3 | 27.5 ± 5.0 | 28.5 ± 5.9 | 28.0 ± 5.4 | 65.9 ± 11.0 | 83.6 ± 16.2 | 76.2 ± 16.7 | 72.7 ± 15.6 | 84.7 ± 15.8 | 78.5 ± 16.8 |
| **Estimated LBM (kg)** | 50    | 50   | 30.7 ± 10.4 | 27.7 ± 3.6 | 28.2 ± 5.3 | 27.5 ± 5.0 | 28.5 ± 5.9 | 28.0 ± 5.4 | 65.9 ± 11.0 | 83.6 ± 16.2 | 76.2 ± 16.7 | 72.7 ± 15.6 | 84.7 ± 15.8 | 78.5 ± 16.8 |
| **Estimated Body Fat (%)** | 48.7 ± 14.9 | 48.7 ± 14.9 | 30.7 ± 10.4 | 27.7 ± 3.6 | 28.2 ± 5.3 | 27.5 ± 5.0 | 28.5 ± 5.9 | 28.0 ± 5.4 | 65.9 ± 11.0 | 83.6 ± 16.2 | 76.2 ± 16.7 | 72.7 ± 15.6 | 84.7 ± 15.8 | 78.5 ± 16.8 |

Supplementary Table 2: Whole-Body lean body mass-corrected maximal standardized uptake value (SULmax) across cancer types in men and women. A two-way ANOVA with Tukey’s test for multiple comparisons was used to compare variables between women and men across cancer types. Significance is stated as p<0.05.

|                  | Breast Cancer | HNSCC | STS | NSCLC | All Cancers |
|------------------|---------------|-------|-----|-------|-------------|
|                  | Female | Male | All | Female | Male | All | Female | Male | All | Female | Male | All | Female | Male | All |
| **Tumor SULmax (g/mL)** | 7.3 ± 3.6 | N/A | 7.3 ± 3.6 | 9.5 ± 4.5 | 10.3 ± 5.7 | 10.1 ± 5.5 | 6.6 ± 3.5 | 9.9 ± 6.1 | 8.1 ± 5.1 | 7.5 ± 4.6 | 8.7 ± 5.1 | 8.2 ± 4.9 | 7.3 ± 3.9 | 9.6 ± 5.6 | 8.4 ± 4.9 |
| **Muscle SULmax (g/mL)** | 0.6 ± 0.2 | N/A | 0.6 ± 0.2 | 0.8 ± 0.3 | 0.9 ± 0.2 | 0.9 ± 0.2 | 0.7 ± 0.3 | 0.9 ± 0.3 | 0.8 ± 0.3 | 0.8 ± 0.2 | 0.8 ± 0.2 | 0.8 ± 0.2 | 0.7 ± 0.2 | 0.8 ± 0.2 | 0.8 ± 0.2 |
| **WAT SULmax (g/mL)** | 0.3 ± 0.1 | N/A | 0.3 ± 0.1 | 0.6 ± 0.4 | 0.4 ± 0.2 | 0.5 ± 0.2 | 0.3 ± 0.1 | 0.5 ± 0.2 | 0.4 ± 0.2 | 0.3 ± 0.1 | 0.4 ± 0.2 | 0.3 ± 0.1 | 0.3 ± 0.2 | 0.4 ± 0.2 | 0.4 ± 0.2 |
| **BAT SULmax (g/mL)** | 0.6 ± 0.3 | N/A | 0.6 ± 0.3 | 0.7 ± 0.2 | 0.8 ± 0.3 | 0.8 ± 0.3 | 1.0 ± 0.6 | 0.8 ± 0.2 | 0.9 ± 0.5 | 0.7 ± 0.2 | 0.7 ± 0.2 | 0.7 ± 0.2 | 0.7 ± 0.3 | 0.7 ± 0.3 | 0.7 ± 0.3 |
| **Liver SULmax (g/mL)** | 1.6 ± 0.2 | N/A | 1.6 ± 0.2 | 2.1 ± 0.4 | 2.5 ± 0.4 | 2.4 ± 0.5 | 1.9 ± 0.2 | 2.4 ± 0.4 | 2.0 ± 0.3 | 2.0 ± 0.5 | 2.3 ± 0.6 | 2.1 ± 0.6 | 1.8 ± 0.4 | 2.4 ± 0.5 | 2.1 ± 0.5 |
| **Spleen SULmax (g/mL)** | 1.3 ± 0.3 | N/A | 1.3 ± 0.3 | 1.8 ± 0.3 | 2.1 ± 0.4 | 2.1 ± 0.4 | 1.7 ± 0.4 | 1.8 ± 0.2 | 1.7 ± 0.3 | 1.6 ± 0.4 | 1.9 ± 0.3 | 1.8 ± 0.3 | 1.5 ± 0.3 | 2.0 ± 0.4 | 1.8 ± 0.4 |