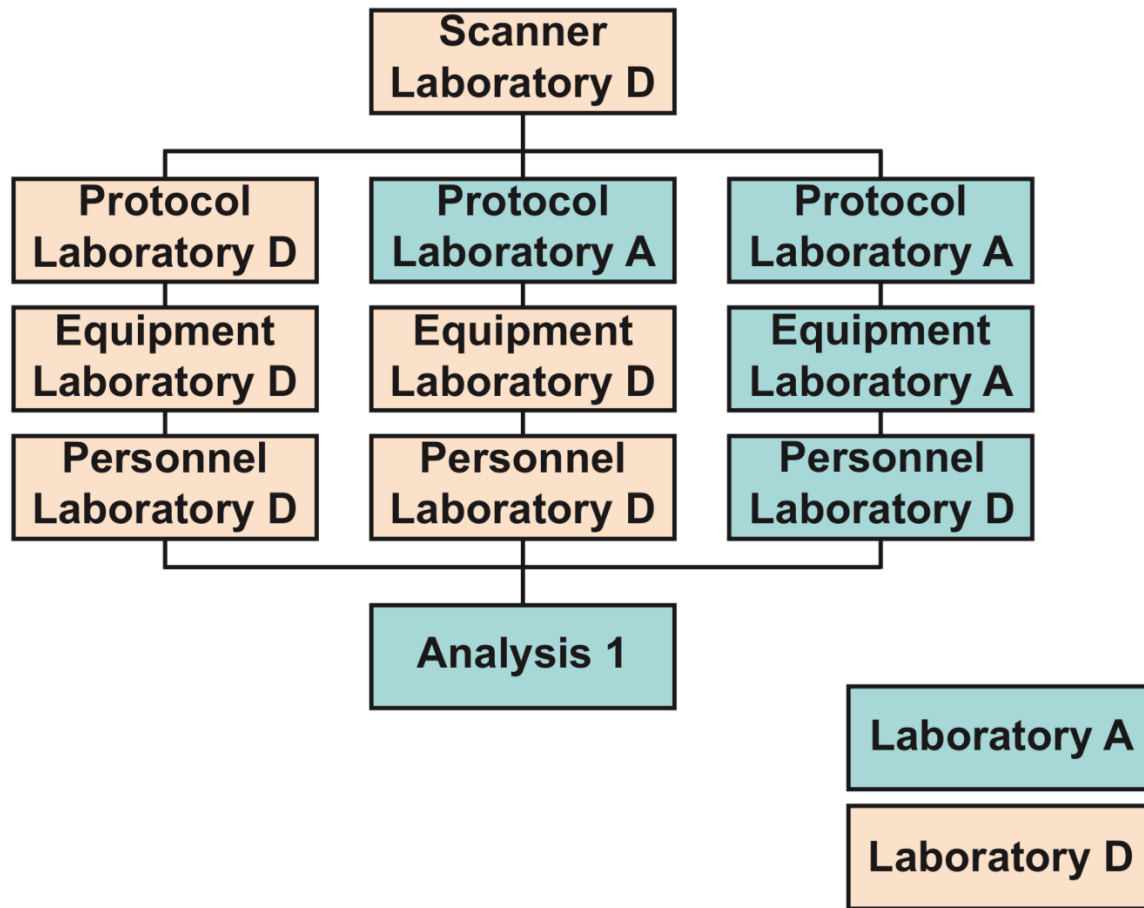
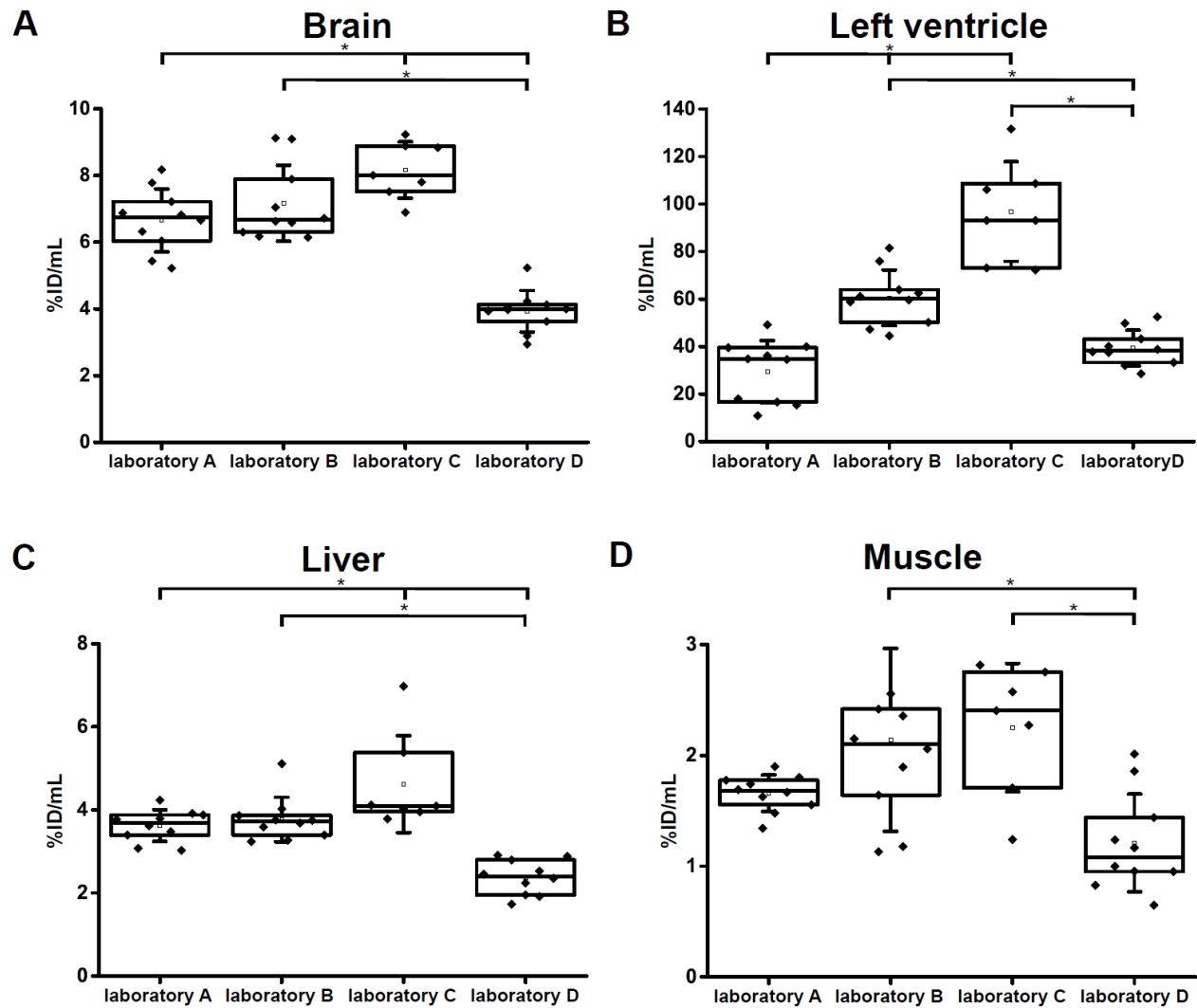


Supplementary Figure 1



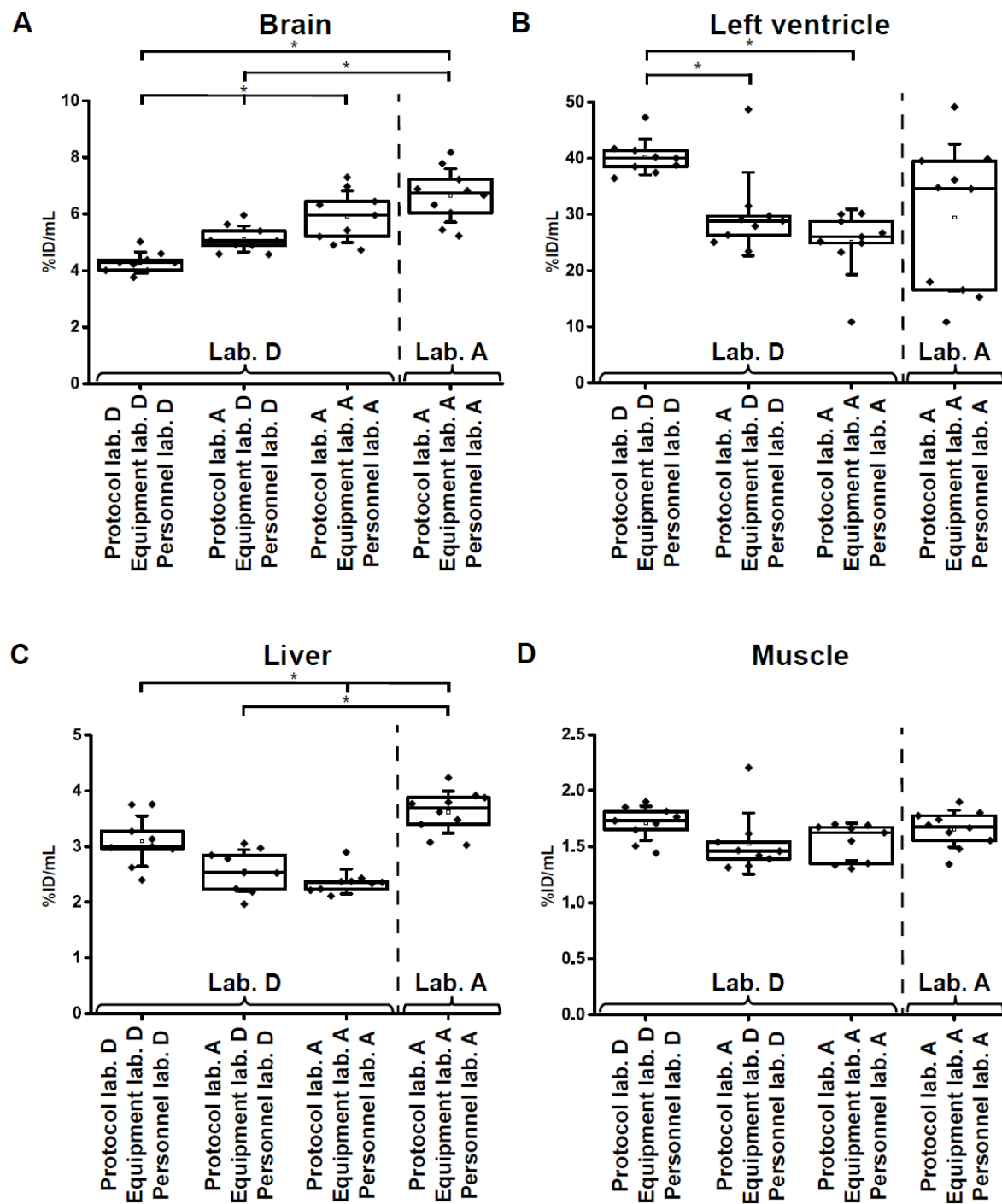
SUPPLEMENTAL FIGURE 1: Schematic overview of experiment 2.

Supplementary Figure 2



SUPPLEMENTAL FIGURE 2: Experiment 1: Lab-specific ^{18}F -FDG standard imaging protocols. Quantitative analysis (%injected dose/mL (%ID/mL)) of ^{18}F -FDG uptake for the brain (A), left ventricle (B), liver (C) and muscle (D) for the four laboratories (laboratories A, B & D: n=10, laboratory C: n=7). Data were reconstructed using OSEM2D with attenuation correction. Box plots show group means, 25% and 75% confidence intervals, one upper and lower standard deviation of the mean and all individual data points. Test results that were statistically significant using the Tukey-Kramer test (with $\alpha = 5\%$) after Bonferroni-Holm correction (applied separately for each organ) are marked with an asterisk (*).

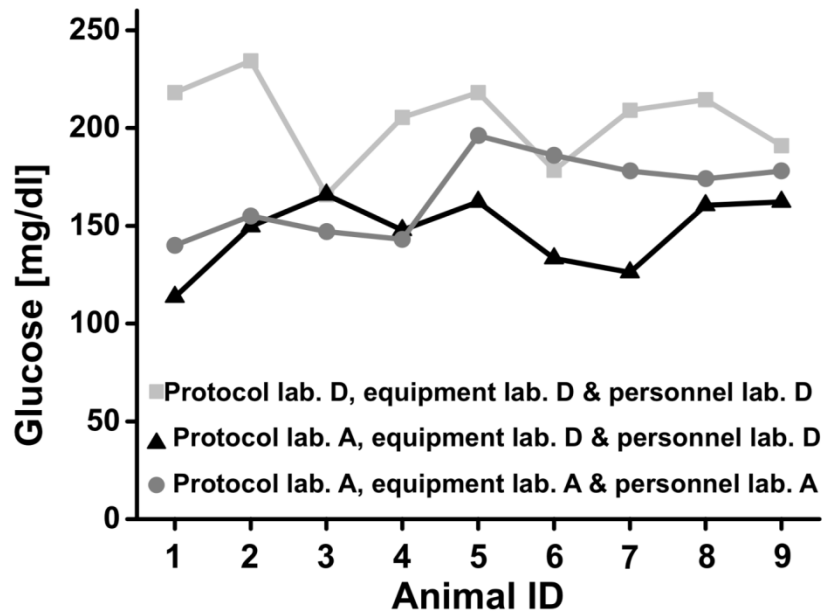
Supplementary Figure 3



SUPPLEMENTAL FIGURE 3: Experiment 2: Influence of animal handling and personnel on the data comparability. Quantitative analysis (%injected dose/mL (%ID/mL)) of ¹⁸F-FDG uptake is depicted for the brain (A), left ventricle (B), liver (C) and muscle (D) for the three studies (n=9) in laboratory D (protocol and personnel laboratory D, protocol laboratory A and personnel laboratory A).
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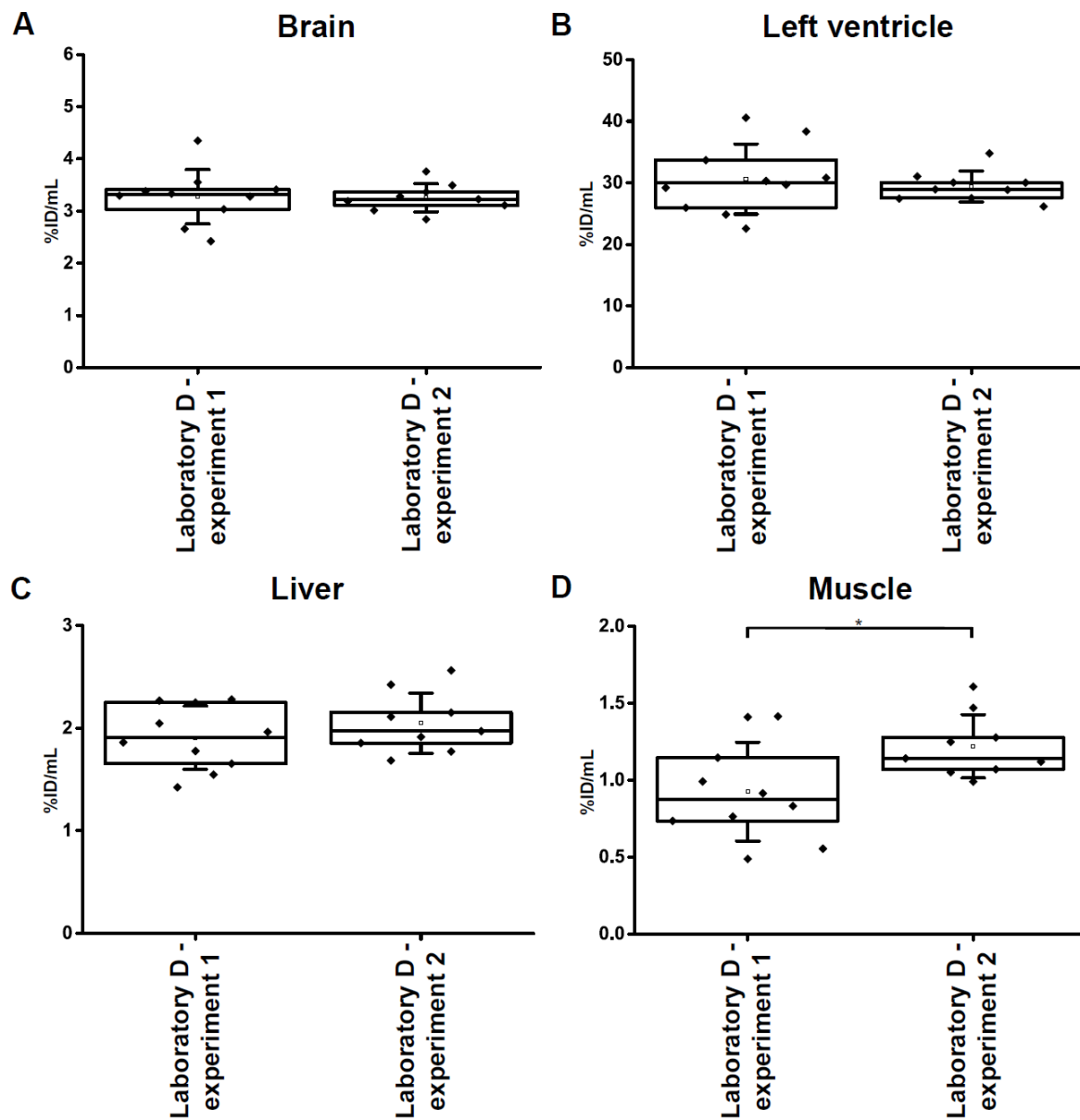
D, protocol and personnel laboratory A) and compared to the data from laboratory A from experiment 1 (n=10). Data were reconstructed using OSEM2D with attenuation correction. Box plots show group means, 25% and 75% confidence intervals, one upper and lower standard deviation of the mean and all individual data points. Test results that were statistically significant (with $\alpha = 5\%$) after Bonferroni-Holm correction (applied separately for each organ) using the one-sample t-test (comparison of data acquired in laboratory D) and the two-sample t-test (comparison of data acquired in laboratory D to the data acquired in laboratory A) are marked with an asterisk (*).Lab.: laboratory.

Supplementary Figure 4



SUPPLEMENTAL FIGURE 4: Influence of animal handling and personnel on reproducibility: Blood glucose levels for the animals (n=9) before ^{18}F -FDG injection are shown for each animal individually for the three setups (protocol and personnel laboratory D, protocol laboratory A and personnel laboratory D, protocol and personnel laboratory A). Lab.: laboratory.

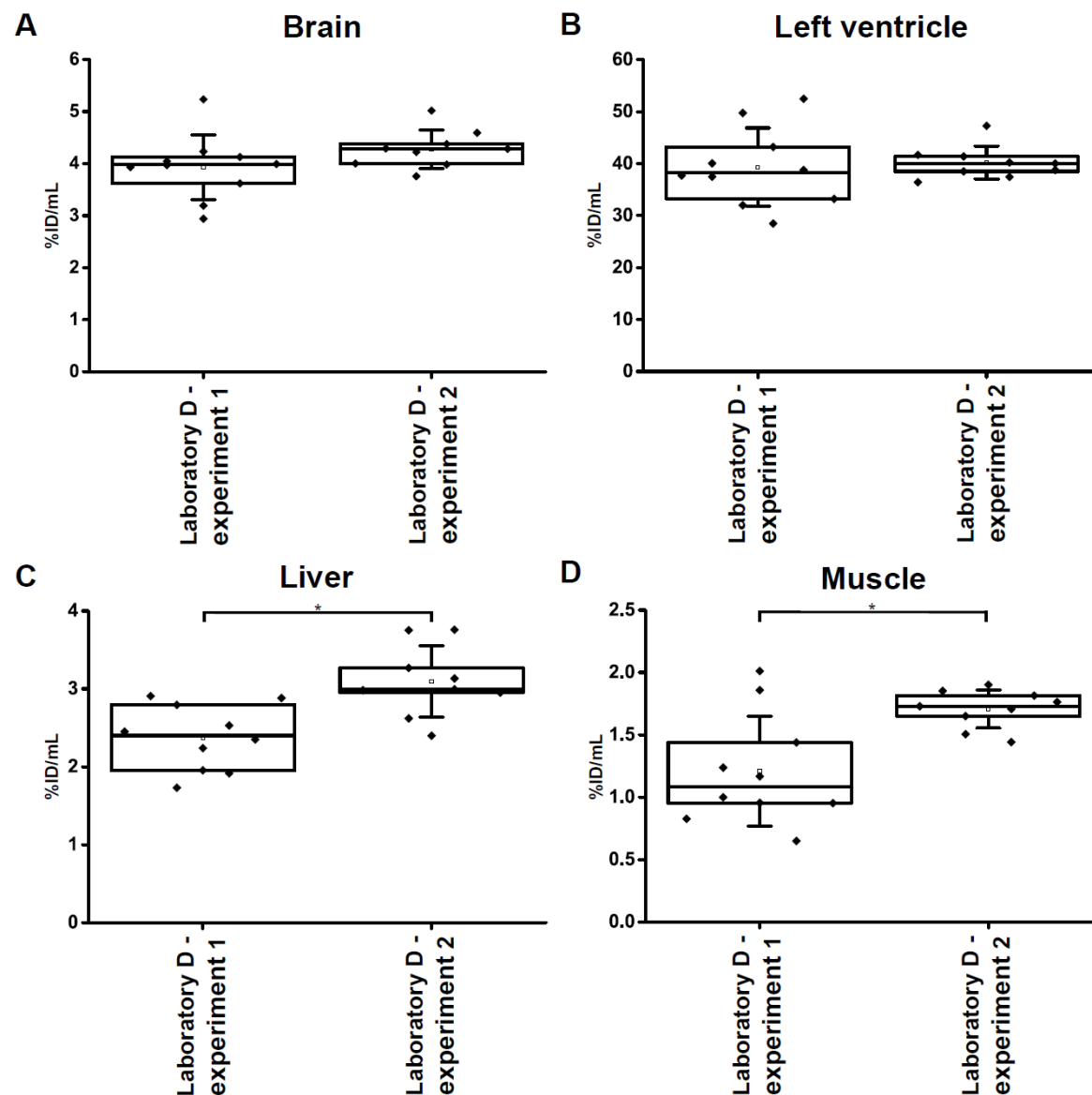
Supplementary Figure 5



SUPPLEMENTAL FIGURE 5: Test-Retest study. Quantitative analysis (%injected dose/mL (%ID/mL)) of ^{18}F -FDG uptake is illustrated for the brain (A), left ventricle (B), liver (C) and muscle (D) for the same scanner/laboratory and imaging protocol at two different time points (experiment 1: n=10, experiment 2: n=9). Data were reconstructed using OSEM2D without attenuation correction. Box plots show group means, 25% and 75% confidence intervals, one upper

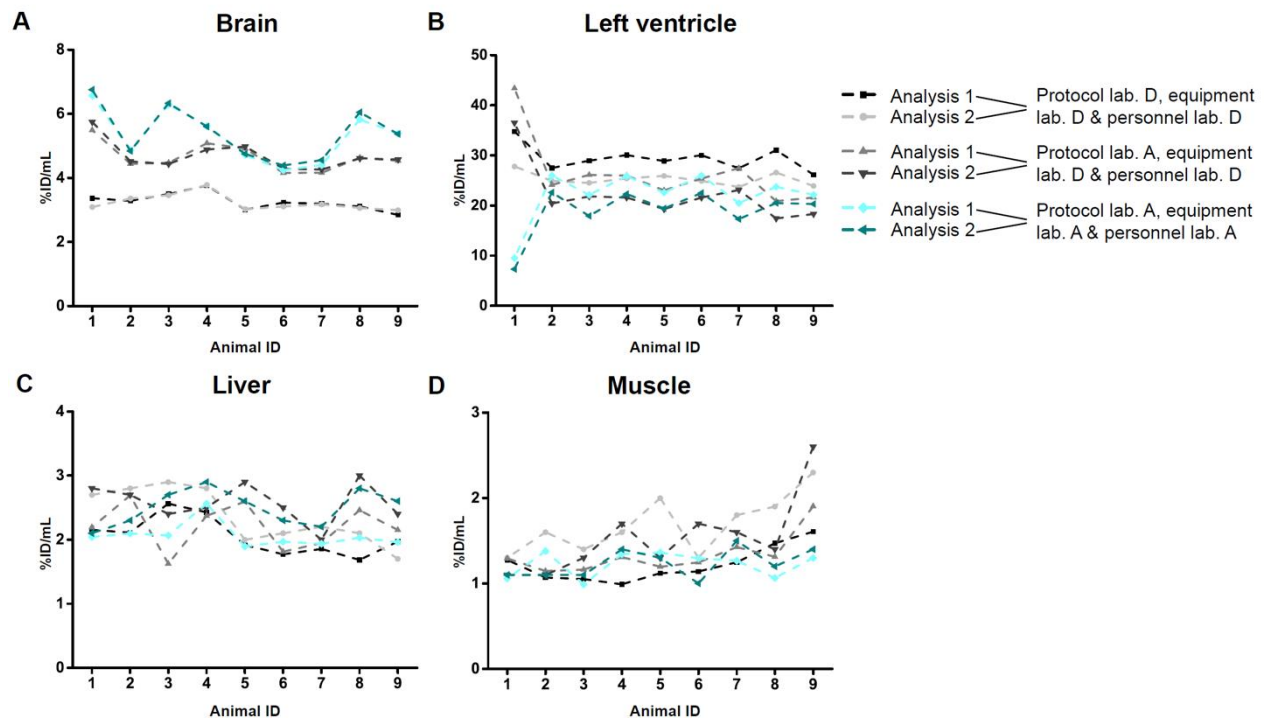
and lower standard deviation of the mean and all individual data points. Test results that were statistically significant using the two-sample t-test (with $\alpha = 5\%$) are marked with an asterisk (*).

Supplementary Figure 6



SUPPLEMENTAL FIGURE 6: Test-Retest study. Quantitative analysis (%injected dose/mL (%ID/mL)) of ^{18}F -FDG uptake is illustrated for the brain (A), left ventricle (B), liver (C) and muscle (D) for the same scanner and laboratory at two different time points (interval of 1.5 years, experiment 1: n=10, experiment 2: n=9). Data were reconstructed using OSEM2D with attenuation correction. Box plots show group means, 25% and 75% confidence intervals, one upper and lower standard deviation of the mean and all individual data points. Test results that were statistically significant using the two-sample t-test (with $\alpha = 5\%$) are marked with an asterisk (*).

Supplementary Figure 7



SUPPLEMENTAL FIGURE 7: Experiment 3: Reproducibility of PET image analysis. Comparison of the quantitative analysis (%injected dose/mL (%ID/mL)) of ^{18}F -FDG uptake in the brain (A), left ventricle (B), liver (C) and muscle (D) for each animal (n=9) are depicted. The same datasets were analyzed individually by trained investigators from laboratory A (analysis 1) and from laboratory D (analysis 2). Data were reconstructed using OSEM2D without attenuation correction. Lab.: laboratory.

Supplemental Table 1A, B: Detailed overview of the number of animals used for image analysis, mean body weight, mean blood glucose levels, and mean injected activity 55 Min post injection for all investigated groups for Experiment 1 (A) and Experiment 2 (B).

A

experiment 1				
	laboratory A	laboratory B	laboratory C	laboratory D
number of animals used for image analysis	10	10	7	10
mean body weight [g]	17.72 ± 0.73	20.71 ± 1.18	18.41 ± 0.51	21.32 ± 1.12
mean blood glucose levels [mg/dL]	173.10 ± 36.30	128.94 ± 30.04	202.43 ± 27.34	182.36 ± 15.24
mean injected activity 55 min post injection [MBq]	8.50 ± 0.27	8.48 ± 0.37	4.67 ± 1.34	5.68 ± 0.46

B

experiment 2			
laboratory D			
	protocol laboratory D, equipment laboratory D, personnel laboratory D	protocol laboratory A, equipment laboratory D, personnel laboratory D	protocol laboratory A, equipment laboratory A, personnel laboratory A
number of animals used for image analysis	9	9	9
mean body weight [g]	21.53 ± 0.98	20.39 ± 0.63	20.90 ± 0.41
mean blood glucose levels [mg/dL]	203.83 ± 21.59	146.76 ± 18.51	166.33 ± 20.43
mean injected activity 55 min post injection [MBq]	9.55 ± 0.29	7.86 ± 0.33	9.59 ± 0.32

Supplemental Table 2. Comparison of the used imaging protocols in Experiment 1. Rpm: respirations per minute.

	laboratory A	laboratory B	laboratory C	laboratory D
fasting	10 h before first injection	2 h before first injection	6 h, individually based on injection time	no
blood sampling	retrobulbar punction	tail vein	peripheral leg vein	saphenous vein
anesthesia	isoflurane, 1.5%; vaporized in 1.0 L/min oxygen; constant anesthesia; not moisturized	isoflurane, 1.5%–2.0%, vaporized in 0.8 L/min oxygen; anesthesia manually adjusted dependent on respiration rate; not moisturized	isoflurane, 1%–2%, vaporized in ?0.5 L/min oxygen; manually adjusted dependent on respiration rate; moisturized	Isoflurane, 1.8% ± 0.2%, vaporized in 0.6 L/min oxygen; anesthesia manually adjusted dependent on respiration rate; moisturized
tracer application	lateral tail vein, bolus	lateral tail vein, bolus	lateral tail vein, continuous infusion (1 min)	lateral tail vein, bolus
PET scan	Inveon animal bed, one animal	Inveon animal bed, one animal	m2m animal bed, 2 animals side-by-side	Minerve animal bed, 2 animals side-by-side
heating during scan	feedback control set to 37°C (measured temperature 37.8 ± 0.45°C)	constant (37°C); not measured	constant (38°C); not measured	constant (37°C) ; not measured

respiratory monitoring	no	43.4 ± 16.4 rpm (<i>n</i> = 9)	30–80 rpm	70.9 ± 9.9 rpm (<i>n</i> = 8)
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