Electronic Supplementary Material

Test-Retest Stability of Cerebral 2'-Deoxy-2-[^{18}F]Fluoro-D-gGlucose ([^{18}F]FDG) Positron Emission Tomography (PET) in Male and Female Rats

Journal: Molecular Imaging and Biology

Jürgen W.A. Sijbesma, Aren van Waarde*, David Vállez García, Hendrikus H. Boersma, Riemer H.J.A. Slart, Rudi A.J.O. Dierckx, Janine Doorduin

University of Groningen, University Medical Center Groningen, Department of Nuclear Medicine and Molecular Imaging, Hanzeplein 1, 9713GZ Groningen, The Netherlands

First author: Ing. J.W.A.Sijbesma, University of Groningen, University Medical Center Groningen, Department of Nuclear Medicine and Molecular Imaging, Hanzeplein 1, 9713GZ Groningen, The Netherlands. E-mail: j.w.a.sijbesma@umcg.nl. Telephone: +31-50-3613183. Telefax: +31-50-3611687.

* Corresponding author: Dr. A.van Waarde, University of Groningen, University Medical Center Groningen, Department of Nuclear Medicine and Molecular Imaging, Hanzeplein 1, 9713GZ Groningen, The Netherlands. E-mail: a.van.waarde@umcg.nl. Telephone: +31-50-3613215. Telefax: +31-50-3611687.

Supplementary Table 1: $rCMR_{glucose}$

Region	MALE Test Mean	SD	MALE Retest Mean	SD	FEMALE Test Mean	SD	FEMALE Retest Mean	SD	% relative difference MALE	% relative difference FEMALE	TRV MALE	TRV FEMALE	COV Test MALE	COV Retest MALE	COV Test FEMALE	COV Retest FEMALE	ICC MALE	ICC FEMALE
Entire brain	20.91	7.20	17.33$^{\$}$	4.27	20.75	4.06	15.94$^{\$}$	1.63	-13.02	-21.07	21.29	26.63	34.42	24.67	19.59	10.21	0.78	0.23
Cerebellum	20.19	6.60	17.04$^{\$}$	4.23	21.49	2.99	17.75$^{\$}$	2.05	-12.31	-16.32	17.69	21.75	32.70	24.83	13.92	11.57	0.78	0.08
Mesencephalon	23.67	7.85	19.31$^{\$}$	4.37	23.18	4.10	18.49$^{\$}$	2.16	-14.94	-18.44	20.47	24.30	33.14	22.64	17.68	11.66	0.73	0.29
Pons	23.53	6.63	19.27$^{\$}$	3.69	22.76	3.54	18.30$^{\$}$	1.80	-15.70	-18.33	18.29	22.21	28.16	19.13	15.57	9.85	0.72	0.23
Striatum	23.11	7.89	19.20$^{\$}$	4.63	22.15	4.65	17.11$^{\$}$	1.75	-12.56	-19.92	22.38	26.99	34.13	24.13	21.00	10.25	0.78	0.18
Cortex	19.68	7.12	16.36$^{\$}$	4.40	19.49	4.50	14.35$^{\$}$	1.56	-12.20	-23.69	22.75	29.70	36.18	26.86	23.08	10.88	0.79	0.25
Hippocampus	22.02	8.41	17.72$^{\$}$	4.89	21.53	4.60	16.29$^{\$}$	1.73	-14.86	-21.91	23.38	27.44	38.20	27.60	21.35	10.62	0.78	0.24
Hypothalamus	19.83	6.07	16.52$^{\$}$	3.00	19.82	3.74	16.11$^{\$}$	2.08	-12.69	-16.25	20.97	24.72	30.59	18.19	18.89	12.91	0.71	0.39
Thalamus	24.25	8.27	20.30$^{\$}$	4.74	23.88	4.69	18.39$^{\$}$	1.78	-12.18	-20.62	20.34	27.25	34.09	23.33	19.62	9.66	0.78	0.21

Values for $rCMR_{glucose}$ in male and female rats at test and retest are reported as µmol/min/100 g tissue (mean ± standard deviation). Significant differences are indicated in the following way: $^{\$}$ between retest and test. Significant differences between the sexes were not detected.

Supplementary Table 2: Glucose influx

	MALE Test		MALE Retest		FEMALE Test		FEMALE Retest		% relative difference	% relative difference	TRV	TRV	COV Test	COV Retest	COV Test	COV Retest	ICC	ICC
Region	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**MALE**	**FEMALE**	**MALE**	**FEMALE**	**MALE**	**MALE**	**FEMALE**	**FEMALE**	**MALE**	**FEMALE**
Entire brain	0.012	0.004	0.011	0.003	0.018*	0.003	0.014*$	0.003	-5.43	-19.35	6.11	23.60	29.48	25.09	19.59	17.99	0.93	0.40
Cerebellum	0.012	0.003	0.011	0.003	0.018*	0.003	0.016*$	0.003	-4.36	-14.45	7.63	18.41	28.68	23.29	17.66	21.65	0.93	0.62
Mesencephalon	0.014	0.004	0.013	0.003	0.020*	0.004	0.016*$	0.003	-7.20	-16.72	8.70	20.90	29.43	21.15	19.17	19.86	0.90	0.56
Pons	0.014	0.003	0.013$	0.003	0.019*	0.003	0.016*$	0.003	-7.79	-16.49	8.88	20.36	25.06	19.84	16.92	16.92	0.93	0.51
Striatum	0.013	0.004	0.013	0.003	0.019*	0.004	0.015$	0.003	-4.95	-18.39	11.12	23.75	28.26	25.05	20.69	18.15	0.93	0.37
Cortex	0.012	0.004	0.011	0.003	0.017*	0.004	0.013$	0.002	-4.72	-22.01	11.52	26.54	30.98	27.83	21.89	17.04	0.93	0.33
Hippocampus	0.013	0.004	0.012	0.003	0.018*	0.004	0.014*$	0.003	-7.58	-20.18	12.04	24.72	32.99	27.38	21.02	17.63	0.92	0.39
Hypothalamus	0.012	0.003	0.011	0.002	0.017*	0.003	0.014*$	0.003	-4.99	-14.75	9.08	19.08	24.92	18.03	18.66	18.65	0.91	0.51
Thalamus	0.014	0.004	0.013	0.003	0.020*	0.004	0.016*$	0.003	-4.43	-18.89	10.31	23.89	29.52	24.89	20.13	19.09	0.94	0.42

Values for glucose influx in male and female rats at test and retest are reported as ml/ccm/min (mean ± standard deviation). Significant differences are indicated in the following way:* between females and males, and $ between retest and test.

Supplementary Table 3: [^{18}F]FDG uptake (SUV)

	MALE Test		MALE Retest		FEMALE Test		FEMALE Retest		% relative difference	% relative difference	TRV	TRV	COV Test	COV Retest	COV Test	COV Retest	ICC	ICC
Region	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**MALE**	**FEMALE**	**MALE**	**FEMALE**	**MALE**	**MALE**	**FEMALE**	**FEMALE**	**MALE**	**FEMALE**
Entire brain	2.47	0.58	2.45	0.73	3.27*	0.73	2.88$^{\$}$	0.48	-1.24	-9.41	5.83	16.28	23.44	29.90	22.38	16.53	0.96	0.60
Cerebellum	2.44	0.52	2.43	0.73	3.28*	0.60	3.01$^{\$}$	0.53	-1.08	-7.13	9.10	13.89	21.37	30.10	18.26	17.78	0.92	0.72
Mesencephalon	2.72	0.62	2.64	0.74	3.43*	0.70	3.05$^{\$}$	0.52	-2.78	-8.85	8.17	14.74	22.76	28.00	20.51	16.88	0.94	0.67
Pons	2.64	0.57	2.57	0.69	3.32*	0.65	2.97$^{\$}$	0.48	-2.78	-8.63	7.23	14.33	21.43	26.96	19.73	16.25	0.95	0.69
Striatum	2.63	0.64	2.62	0.81	3.29	0.78	2.88$^{\$}$	0.47	-1.05	-9.15	5.74	16.36	24.34	30.73	23.62	16.49	0.97	0.55
Cortex	2.35	0.57	2.35	0.73	2.95*	0.72	2.53$^{\$}$	0.39	-0.59	-10.77	4.95	16.65	24.49	31.07	24.29	15.30	0.97	0.54
Hippocampus	2.58	0.67	2.55	0.79	3.23	0.76	2.80$^{\$}$	0.44	-1.88	-10.13	5.07	16.11	25.96	30.87	23.46	15.78	0.98	0.57
Hypothalamus	2.41	0.47	2.39	0.59	3.03*	0.65	2.71$^{\$}$	0.45	-1.50	-8.10	5.31	16.03	19.44	24.60	21.32	16.77	0.96	0.63
Thalamus	2.83	0.67	2.79	0.82	3.56*	0.79	3.11$^{\$}$	0.53	-1.59	-9.91	5.85	16.56	23.65	29.38	22.26	16.90	0.96	0.60

[^{18}F]FDG uptake in male and female rats at test and retest is reported as SUV (mean ± standard deviation) and is therefore dimension-less. Significant differences are indicated in the following way: * between females and males, and $^{\$}$ between retest and test.

Supplementary Table 4: [^{18}F]FDG uptake (normalized SUV)

	MALE Test		MALE Retest		FEMALE Test		FEMALE Retest		% relative difference	% relative difference	TRV	TRV	COV Test	COV Retest	COV Test	COV Retest	ICC	ICC
Region	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**MALE**	**FEMALE**	**MALE**	**FEMALE**	**MALE**	**MALE**	**FEMALE**	**FEMALE**	**MALE**	**FEMALE**
Entire brain	2.59	0.76	2.31$^{\$}$	0.75	3.31	0.83	2.83$^{\$}$	0.50	-9.90	-11.22	13.51	17.99	29.47	32.33	25.06	17.50	0.92	0.61
Cerebellum	2.56	0.69	2.30	0.77	3.31*	0.65	2.95*$^{\$}$	0.52	-9.95	-8.94	15.78	15.43	27.08	33.29	19.66	17.59	0.90	0.68
Mesencephalon	2.84	0.77	2.50$^{\$}$	0.77	3.46	0.79	3.01$^{\$}$	0.54	-11.51	-10.66	15.88	16.81	27.26	30.76	22.83	17.91	0.89	0.66
Pons	2.75	0.71	2.42$^{\$}$	0.71	3.35	0.74	2.92$^{\$}$	0.54	-11.51	-10.53	15.10	16.10	25.67	29.40	22.25	18.38	0.89	0.70
Striatum	2.77	0.85	2.47$^{\$}$	0.81	3.33	0.88	2.84$^{\$}$	0.51	-9.72	-10.78	13.56	18.63	30.59	32.91	26.58	17.99	0.92	0.55
Cortex	2.47	0.76	2.21	0.74	2.99	0.84	2.50$^{\$}$	0.47	-9.21	-12.47	14.04	18.65	30.80	33.23	27.90	18.67	0.92	0.57
Hippocampus	2.72	0.88	2.40$^{\$}$	0.80	3.27	0.87	2.76$^{\$}$	0.51	-10.40	-11.86	14.37	18.17	32.26	33.31	26.68	18.37	0.92	0.59
Hypothalamus	2.53	0.66	2.26$^{\$}$	0.63	3.08	0.77	2.68$^{\$}$	0.53	-10.20	-9.77	13.61	17.95	26.14	27.89	25.00	19.89	0.90	0.68
Thalamus	2.96	0.86	2.63$^{\$}$	0.83	3.60	0.89	3.07$^{\$}$	0.54	-10.26	-11.70	13.51	18.33	29.01	31.46	24.82	17.72	0.91	0.60

[^{18}F]FDG uptake in male and female rats at test and retest is reported as normalized SUV (mean ± standard deviation) and is therefore dimension-less. Significant differences are indicated in the following way: * between females and males, and $^{\$}$ between retest and test.