

Supplementary Documents

Supplementary Table 1. Demographic characteristics of NF-1 patients and number of FASIs according to localization on cMRI.

NF-1 patients	Gender	Age	Number of FASI	Group of FASI	Number of FASI <5mm	Thalamus	W M	Basal ganglia	Pons	Mesencephalon	Cerebellum & middle cerebellar peduncle	Peridentate area
1	F	9	9	3	1	0	0	3	2	1	1	2
2	M	9	4	1	1	0	0	2	2	1	0	0
3	F	9	7	2	2	2	0	2	1	1	0	1
4	F	16	3	1	1	1	0	1	0	1	0	0
5	M	17	3	1	1	2	0	1	0	0	0	0
6	F	12	10	2	4	1	0	3	1	2	0	3
7	F	16	8	2	1	2	0	2	2	2	0	0
8	F	11	9	2	2	2	0	1	1	1	3	1
9	M	9	8	3	2	2	0	1	2	0	1	2
10	F	9	10	3	1	1	0	1	2	2	2	2
11	M	6	14	4	1	2	0	1	2	3	4	2
12	M	8	3	1	1	2	0	1	0	0	0	0
13	F	12	9	2	2	2	0	0	1	2	2	2
14	M	14	4	1	2	1	0	2	0	0	1	0
15	M	5	3	1	3	1	1	1	1	0	0	0
16	M	15	6	2	3	2	0	1	1	0	0	2
17	M	7	7	2	2	2	0	1	1	0	1	2
18	F	10	9	2	3	1	0	2	0	1	3	2
19	M	5	6	2	0	2	1	1	0	0	1	2

Supplementary Table 2: Comparison of the parameters obtained from whole-brain quantification and the ROI analysis of SyMRI showing normal distribution.

Variables	Control		NF-1		p-value
	Mean	Std. Deviation	Mean	Std. Deviation	
BPV (ml)	1279,222	109,649	1390,421	131,233	0,035
ICV (ml)	1401,111	120,164	1510,789	138,677	0,035
WM (ml)	396,200	66,781	419,889	48,839	0,286
GM (ml)	862,939	82,294	949,168	89,159	0,028
MY (ml)	107,967	14,377	129,274	17,254	0,067
%MY/BPV=MYF	8,539	0,857	8,516	0,805	0,933
%GM/ICV	61,722	4,659	62,263	2,020	0,763
%MY/ICV	7,800	0,828	7,879	0,825	0,832
R BC MYCvol	0,171	0,023	0,173	0,018	0,962
R BC MYV	28,583	2,319	28,047	2,879	0,899
R BC PD	66,800	1,461	67,332	1,943	0,723
R BC R2	12,996	0,430	12,916	0,411	0,899
L BC MYCvol	0,174	0,023	0,172	0,021	0,962
L BC MYV	28,933	2,037	27,979	3,299	0,718
L BC PD	66,572	1,255	67,316	2,147	0,697
R PUTAMEN MYV	6,911	2,024	7,253	2,150	0,939
R PUTAMEN PD	80,989	1,222	80,863	1,505	0,962
L PUTAMEN MYV	6,522	1,642	7,205	1,733	0,698
L PUTAMEN PD	81,333	1,102	80,779	0,991	0,576
L PUTAMEN R2	12,605	0,514	12,437	0,597	0,723
R GP MYV	13,300	3,076	14,332	3,113	0,718
R GP R2	14,492	1,025	13,663	1,314	0,062
L GP MYV	14,411	3,201	13,711	4,205	0,899
L GP PD	76,478	2,046	76,653	2,737	0,962
R CN MYV	4,939	1,768	5,126	2,117	0,962
R CN R2	12,158	0,383	11,821	0,527	0,058

L CN MYV	5,278	2,014	5,911	2,171	0,723
L CN PD	82,000	1,554	81,516	1,367	0,718
L CN R2	12,128	0,375	11,742	0,568	0,042
R THALAMUS MYCvol	0,058	0,018	0,057	0,010	0,962
R THALAMUS MYV	9,322	2,814	9,153	1,563	0,962
R THALAMUS PD	79,433	1,907	79,763	1,069	0,899
R THALAMUS R2	12,749	0,395	12,347	0,528	0,035
L THALAMUS MYV	9,483	2,442	9,363	2,105	0,962
L THALAMUS PD	79,406	1,675	79,421	1,470	0,988
L THALAMUS R2	12,694	0,381	12,289	0,515	0,035
R IC MYV	32,717	2,195	31,863	2,997	0,723
R IC PD	63,761	1,291	64,474	1,784	0,692
R IC R2	13,017	0,262	12,905	0,360	0,718
L IC MYV	31,972	2,122	31,784	3,158	0,962
L IC PD	64,406	1,286	64,611	1,948	0,962
L IC R2	13,068	0,334	13,068	0,438	0,996
Mesencephalon R2	12,433	0,698	12,489	0,516	0,962
PONS MYCvol	0,088	0,013	0,080	0,016	0,540
PONS MYV	21,967	3,012	18,537	3,731	0,028
PONS R2	12,467	0,848	12,158	0,945	0,718
PONS R1	1,265	0,105	1,200	0,105	0,434

* Independent samples t test- *adjusted p-value was obtained by using the Benjamini-Hochberg (FDR) method.*

Units: MYV (ml), MYCvol (ml), PD (pu), R1 and R2 (s-1).

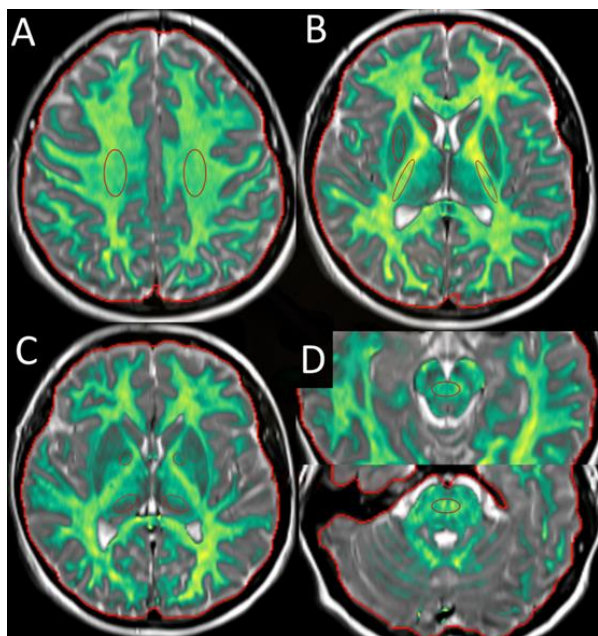
Supplementary Table 3: Comparison of the parameters obtained from whole-brain quantification and the ROI analysis of SyMRI showing non-normal distribution.

Variables	Control		NF-1		p-value
	Median	Min-Max	Median	Min-Max	
BPF (ml)	92	79.3-93.9	92.0	87.6-96.2	0,962
CSF (ml)	109.3	75-309	127.0	57.7-192	0,899
NoN (ml)	13	7.7-65.2	23.0	12-29.8	0,332
%WM/BPV	31.05	25.4-42.5	29.7	27.7-33.7	0,885
%GM/BPV	67.85	54.6-72.9	68.8	64-70.8	0,962
%NoN/BPV	1.15	0.6-4.7	1.7	0.9-2.2	0,618
%WM/ICV	28.4	23.9-39.8	27.6	25.1-32.1	0,962
%CSF/ICV	8	6.1-20.7	9.3	3.8-12.5	0,939
%NoN/ICV	1.1	0.6-4.3	1.5	0.8-2.1	0,718
R BC R1	1.45	1.4-1.6	1.5	1.3-1.6	0,899
L BC R2	13	12-13.7	13,00	12.4-15	0,962
L BC R1	1.5	1.4-1.6	1.5	1.4-1.6	0,723
R PUTAMEN MYCvol	0.03	0.02-0.04	0.03	0.01-0.04	0,962
R PUTAMEN R2	12.6	11.3-13.4	12.7	11.1-13.2	0,962
R PUTAMEN R1	1	0.9-1.1	1,00	0.9-1.1	0,899
L PUTAMEN MYCvol	0.03	0.02-0.04	0.03	0.01-0.05	0,718
L PUTAMEN R1	1	0.9-1.1	1,00	1-1.1	0,718
R GP MYCvol	0.03	0.01-0.04	0.03	0.02-0.04	0,718
R GP PD	76.75	73-82	76.5	73-79	0,899
R GP R1	1.2	1.1-1.3	1.2	1.1-1.3	0,962
L GP MYCvol	0.03	0.02-0.04	0.03	0.02-0.04	0,697
L GP R2	14.55	12.8-15.5	13.6	11-16.3	0,304
L GP R1	1.2	1.1-1.3	1.2	1-1.4	0,962
R CAUDAT MYCvol	0.015	0.01-0.02	0.01	0.01-0.03	0,962
R CN PD	82.2	80.8-86.7	82.5	79-85	0,962

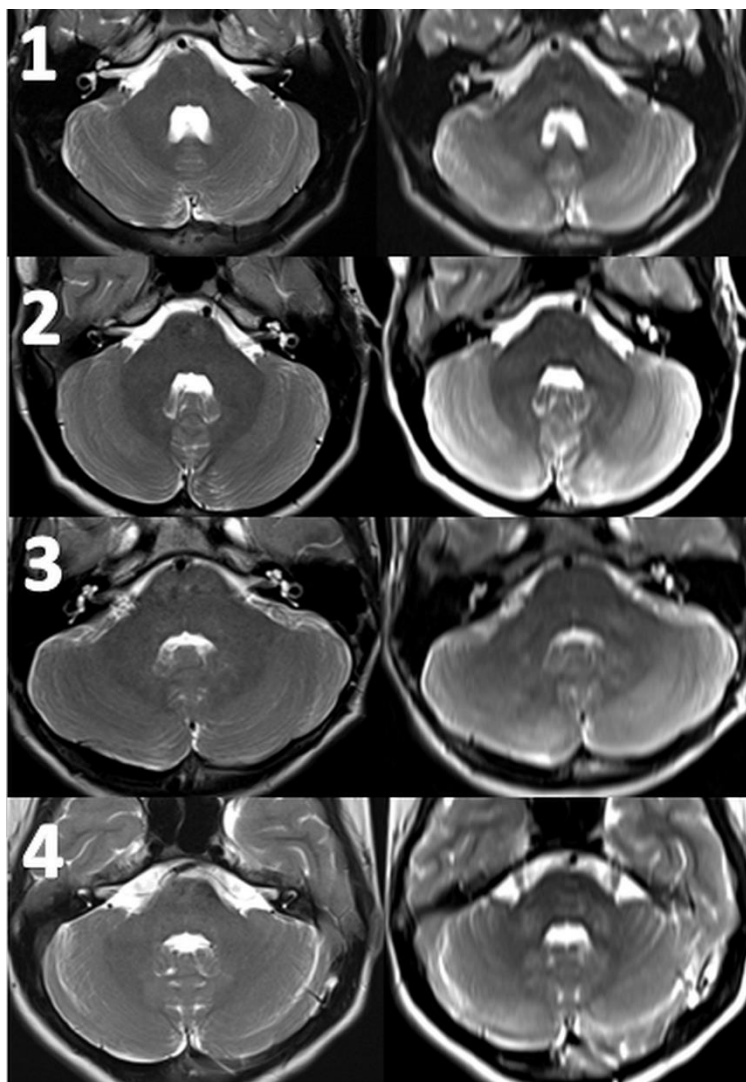
R CN R1	0.9	0.8-1	1.0	0.8-1	0,697
L CN MYCvol	0.02	0.01-0.03	0.02	0.01-0.03	0,962
L CN R1	0.9	0.8-1.02	1,00	0.8-1	0,870
R THALAMUS R1	1.1	1-1.17	1,00	1-1.1	0,623
L THALAMUS R1	1.1	1-1.2	1,00	1-1.1	0,576
R IC MYCvol	0.1	0.08-0.12	0.1	0.08-0.12	0,963
R IC R1	1.4	1.3-1.5	1.5	1.3-1.7	0,620
L IC MYCvol	0.1	0.09-0.11	0.1	0.09-0.13	0,697
L IC R1	1.4	1.3-1.6	1.5	1.3-1.5	0,855
Mesencephalon MYCvol	0.09	0.06-0.10	0.1	0.06-0.12	0,576
Mesencephalon MYV	21.85	15-26.3	24.00	14.2-26.5	0,718
Mesencephalon PD	71.4	67.6-75.8	70.00	68-76.3	0,962
Mesencephalon R1	1.2	1.1-1.5	1.3	1.1-1.5	0,899
PONS PD	70.9	66.1-74	73.00	71-78	0,332

*Mann Whitney U test

Units: MYV (ml), MYCvol (ml), PD (pu), R1 and R2 (s-1).



Supplementary Figure 1: Localization of ROIs from both cerebral hemispheres and brainstem.



Supplementary Figure 2: Examples for the peridentate area artifact.