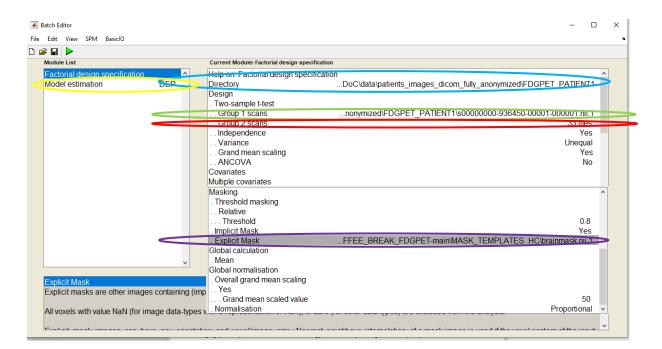


SPM maps of relatively hypometabolism and relatively preserved metabolism based on FDG-PET images

The software used in this procedure are Matlab and SPM 12 (make sure you know where the images and other batches are in the computer).

1) In the Menu window, click on "batch". Open the "stat batch" (same procedure than before). Change the directory to the folder of the patient (same procedure than before). Change the Group 1 scan (use the <u>sws image</u> of your patient), and check that the group 2 includes the sws image of the 33 healthy controls (path of your own computer). If needed, change the path of the explicit mask (brain mask, lower in the batch). Check also in the second module (left panel) that the model estimation depends on the first module (as in the "normalise & smooth" batch). Save the batch! Click on run.





2) When Matlab has run, click on "Results" in the Menu window. Go as previously shown in the CTAC folder of your patient. Choose the SPM that was just created, it will make "done" available. Cclick on "done".

Select SPM.mat		- 0	×
Dir	C:\Users\Arianna\Desktop\FDG_PET_WORKSHOP\hbp-d000052_FDG-PET-in-HC-and-DoC\data\patients_images_dicom_fully_anonymized\FDGPET_	PATIENT1	
Up	C:Users/Arianna/Desktop/FDG_PET_WORKSHOP/hbp-d000052_FDG-PET-in-HC and DoC/data/patients_images_dicom_fully_anonymized/FDGPET_PA		~
Prev	C:\Users\Arianna\Desktop\FDG_PET_WORKSHOP\hbp-d000052_FDG-PET-in+HC-and-BoCideta\patients_images_dicom_fully_anonymized\FDGPET_PA	ATIENT1	~
Drive	C: SPM.mat		^
2 Ed Selected 0/[1-1] file	Rec Done Filter Reset .*		~

3) In the new window, specify the contrasts by clicking on "Define new contrast".

•
o all
no contrast(s)
Design within
Design matrix
Done parameter estimability



4) Name the first one "HYPO" and specify "-1 1" (be careful to leave a space between both numbers), and then click on OK. Do the same for "PRES" with "1 -1" as a contrast

SPM contrast manager	
name define contrast Hypo	
type • t-contrast • F-contrast	contrast(s)
contrast weights	
vector 1-1	
	Design matrix
Reset Cancel OK	parameter estimability
name defined, contrast defined	



5) When your two contrasts are prepared, click on "HYPO" and then "Done" to analyse the hypometabolic areas (what is less active than healthy controls)

Sele	ect contrast	ʻs	
t-contrasts	O F-contrasts	e all	
#### {type} : name			
001 {T}: Hypo 002 {T}: Pres		^	no contrast(s)
		F	_
		- F	Design matrix
Define new o	ontrast Res	et Done	7
Deline new G	oritidast	de Done	parameter estimability

6) Choose none for the masking.





7) Choose none for the p adjustment. When the p adjustment ask for a value, enter 0.05 and then "enter".

PM12 (6685): Stats: Results		
apply masking	n	one
p value adjustment to control	FWE	none

8) The extend threshold should be 0, then "enter".

SPM12 (6685): Stats: Results	
apply masking	none
threshold {T or p value}	0.05
& extent threshold {voxels}	0



ign Contrasts Atlas			File E	dit View				Window SPN	A Figure	Help				
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						.	7	6		Ą	3	contrast		
			dina 0 'C					1	P		÷.			
			SPIMm() [0, 0, 0]							5 - 10 -			-	
					<		SI	PM{T ₃₃ }		15				
										20 - 25 -			-	
p-values——— — Multiv	ariate ———	Display		PMresu						30			5	
whole brain eigenva	riate CVA	plot	Ext	ent threshold	k = 0 voxels		(unc.)}			35				
										0.5	4			
	tivariate Bayes	overlays		istics: p-1	values adju	sted for se	arch volu	me		0.5	1 Des	1.5 sign matrix	2 2.9	.5
current cluster mu small volume BM		overlays •	Stati set-le		clus	ter-level		-		0.5 peak-level	Des	sign matrix		_
	1		Stati	vel	clus P _{FWE-corr} 4	ter-level FDR-com	^k e P _{unc}	r ^p FWE-con	<i>¶</i> _{FDR-cirr}	peak-level 7	De:	sign matrix	mm mm	1 mn
	1	save	Stati set-le	vel	clus P _{FWE-corr} 4	ter-level FDR-com		n P _{FWE-com}	9 _{FDR-onr} 0.000 0.000	peak-level 7 8.35 7.89	Des (2) 6.08 5.87	sign matrix P _{uncor} 0.000 0.000	mm mm 26 30 -	- 8 - 14
	1		Stati	vel c	Clus P _{FWE-con} G 0.001 C	ter-level FDR-com	^k e P _{unc}	r P _{FWE-corr} 00 0.000 0.000 0.000 0.000	9 _{FDR-cirr} 0.000	peak-level T 8.35	Des (Z_) 6.08	sign matrix P _{uncor}	mm mm 26 30 - 32 -	-8 -14 -10
small volume	1	save	Stati	vel c	Clus P _{FWE-con} G 0.001 C	ter-level FDR-com	ξ <u></u> P _{unc} 1731 Ο.Ο	r Prwe-on 00 0.000 0.000 0.000 52 0.068 0.724	9 _{EDR-orr} 0.000 0.000 0.000 0.009 0.120	peak-level T 8.35 7.89 7.10 4.92 3.62	Des (Z_) 6.08 5.87 5.49 4.23 3.30	sign matrix Puncer 0.000 0.000 0.000 0.000 0.000	mm mm 26 30 - 32 - 56 - 58 -	-8 -14 -10 -26 -52
small volume BM	p-value	save	Stati	vel	Clus Prwe-con 4 0.001 (0.628 (1.000 (ter-level FDR-om 1. 000 3 1. 210 4	⁴ <u>ε</u> P _{unc} 1731 0.0 959 0.0 84 0.5	r P _{FWE-orr} 00 0.000 0.000 0.008 0.724 0.754 35 0.367	9 _{FDR-cent} 0.000 0.000 0.009 0.120 0.128 0.048	peak-level 7 8.35 7.89 7.10 4.92 3.62 3.57 4.11	Des (2) 6.08 5.87 4.23 5.30 2.26 3.67	P _{uncer} P _{uncer} 0.000 0.000 0.000 0.000 0.000 0.001 0.000	mm mm 26 30 - 32 - -66 - -58 - -38 - 18	-8 -14 -10 -26 -52 0
small volume BM	1	save	Stati	vel	Clus Prwe-con 4 0.001 (0.628 (1.000 (ter-level FDR-om 1. 000 3 1. 210 4	4 <u>e</u> P _{unc} 1731 0.0 959 0.0	r Prwe-on 00 0.000 0.000 0.000 52 0.068 0.724 0.754 0.754 0.754 0.754 0.754	9 _{EDR-GHT} 0.000 0.000 0.009 0.120 0.128	peak-level 7 8.35 7.89 7.10 4.92 3.62 3.57 4.11 3.25	(Z_) 6.08 5.87 5.49 4.23 0.00 0.26 3.67 3.00	P _{uncer} 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001	mm mm 26 30 - 32 - -66 - -38 - -38 - 18 -58 -	-8 -14 -10 -26 -52 -68 0 -42
small volume BM	p-value	save	Stati	vel	Clus Protecon 4 0.001 (0.628 (1.000 (1.000 (ter-level FDF-cen 1.000 3 1.210 4 1.979 4 1.979 6	k <u>e</u> P _{unc} 1731 0.0 959 0.0 84 0.5 24 0.4	r Prute-on 0.000 0.000 0.000 0.000 0.764 0.764 35 0.367 0.931 0.946 1.000	4 FDR-GHT 0.000 0.000 0.009 0.120 0.128 0.048 0.207 0.212 0.552	peak-level 7 8.35 7.89 7.10 4.92 9.57 4.11 3.25 9.20 2.21	De: (Z_) 6.08 5.87 4.23 0.30 9.26 3.67 3.00 2.96 2.21	P _{uncer} 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.000 0.001 0.000 0.001	mm mm 26 30 - 36 - -58 - -38 - 18 -58 - -58 - -55 -	-8 -14 -10 -26 -52 -68 0 -42 -34 -50
small volume BM	p-value	save	Stati	vel c s s	Clus Prwe-on 4 0.001 0 0.628 0 1.000 0 1.000 0 1.000 0	ter-level FDF-cen 1.000 3 1.210 4 1.979 4 1.979 6	⁴ <u>ε</u> P _{unc} 1731 0.0 959 0.0 84 0.5	r Prute-on 0.000 0.000 0.000 0.000 0.764 0.764 35 0.367 0.931 0.946 1.000	4 _{FDR-cent} 0.000 0.000 0.009 0.120 0.128 0.048 0.207 0.212	peak-level 7 8,35 7,89 7,10 4,92 0,62 0,57 4,11 3,25 0,20	Des (2) 6.08 5.87 5.49 4.23 3.30 2.26 3.67 3.00 2.96	Pancer 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.002 0.013 0.028	mm mm 26 30 - 32 - 58 - -58 - -58 - 58 - 52 - 12 -1 16 -1	-8 -14 -10 -26 -52 -34 -34 -60 100
small volume BM	p-value	save	Stati	c c	Clus Prive-con 4 0.001 C 0.628 C 1.000 C 1.000 C 1.000 C 1.000 C	ter-level FDR-om 000 3 210 4 979 4 979 6	^k E P _{unc} 1731 0.0 959 0.0 84 0.5 24 0.4 32 0.6 16 0.7	σ Pewe-on 00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 52 0.068 0.764 0.764 35 0.367 0.946 1.000 82 1.000 1.000 1.000	#EDR-CHT 0.000 0.000 0.000 0.000 0.000 0.120 0.128 0.048 0.207 0.212 0.562 0.541	peak-level T 8.35 7.89 7.10 4.92 9.65 4.11 3.25 9.20 2.91 2.52	De: (Z_) 6.08 5.87 5.49 4.23 0.30 0.26 3.67 3.00 2.96 2.29	Puncor 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.002 0.001 0.002 0.003	mm mm 26 30 - 32 - -66 - -38 - -38 - 18 -58 - -55 - -55 - 12 -3	-8 -14 -10 -26 -52 -68 0 -42 -34 -50 100 100 -90

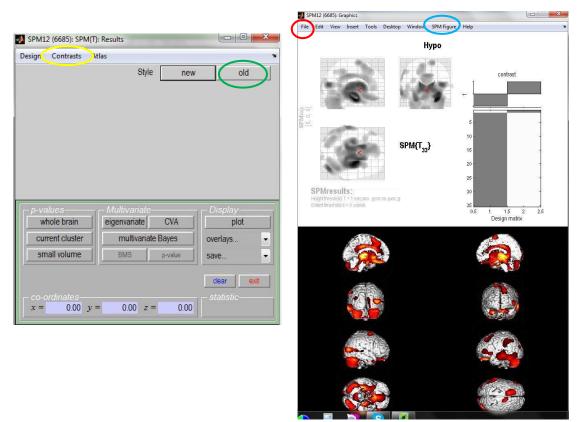
 The results window opens, with the graphic results. To get the SPM figure, click on "Overlays" and then "render" (in the drop-down list).



10) Click on the rend_spm96 file in the MATLAB\SPM12\rend folder (follow previously explained method to reach this folder). "Done" is then available: click ont it.

Dir	C:\Users\Sven\Documents\MATLAB\spm12\rend					
Up Prev	C:\Users\Sven\Documents\MATLAB\spm12\rend					
	C:\Users\Sven\Documents\MATLAB\spm12\rend					
Drive	C:	•	render_single_subj.mat render_smooth_average.mat render_spm96.mat			

11) Specify that you need the old style, and the SPM render will appear in the graph results (the new style does not provide median view of the brain but can also be OK if you do not need it).





- 12) To change the color to blue, you can use "chgcolor" in the command window, or change it through "SPM figure colours colormap gray cool" in the graph window.
- 13) Save the results in the graph window: file > save as (be careful to save as JPG and not mat!! Otherwise not readable out of Matlab).
- 14) To do the preserved areas (as compared to controls), you can go to "contrasts" in the results window, and then click on "change contrast" and then select "pres". Then the procedure is the same (from point 9), except that you do not need to change the color (red is already good for preserved).