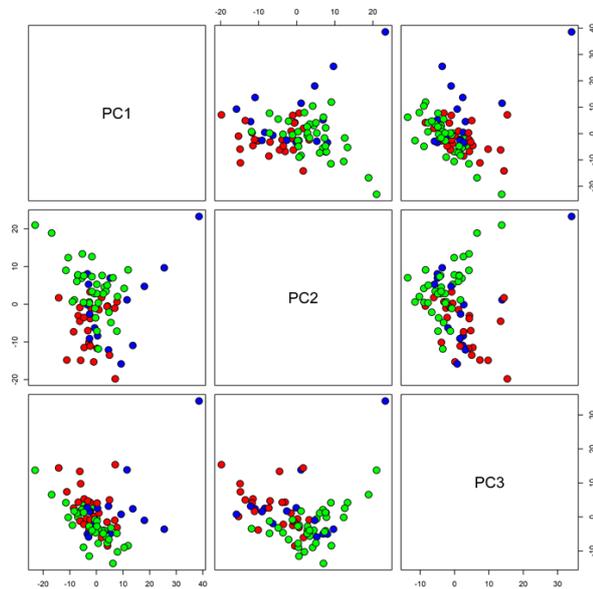
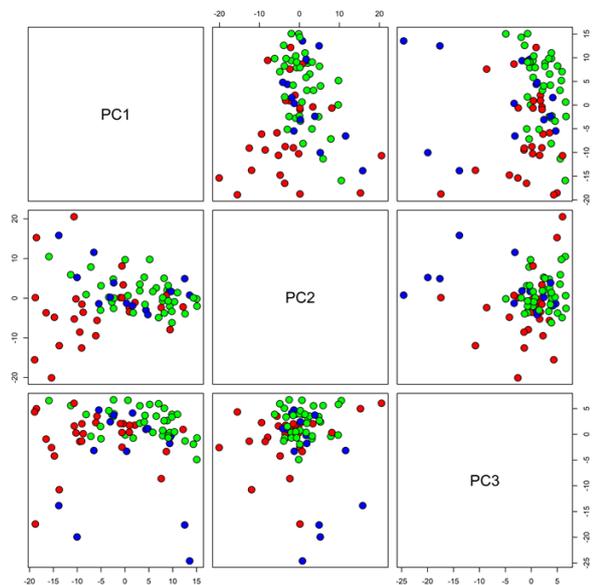


Supplementary materials

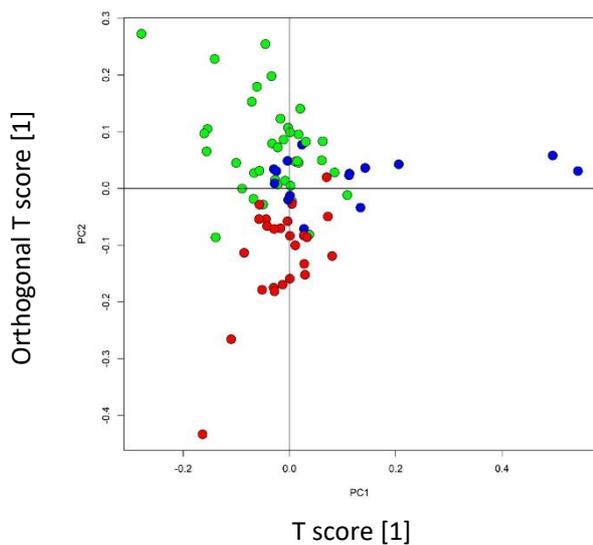
A



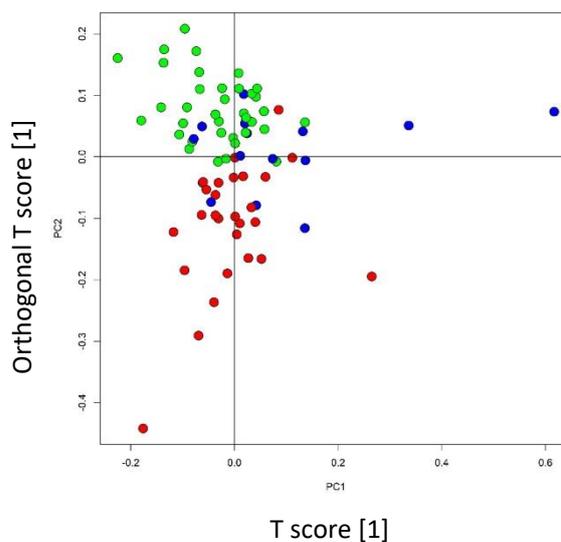
B



Supplementary Figure 1 Principal component analysis of fecal metabolomic one-dimensional proton nuclear magnetic resonance bucketed spectra of healthy subjects (green dots), colorectal cancer patients (red dots) and polyp patients (blue dots). A: PCA score plot of bucketed 1d noesy fecal extract spectra, PC1 variance explained is 16.1%, PC2 is 15.9% and PC3 is 10.7%; B: PCA score plot of bucketed 1d cpmg fecal extract spectra, PC1 variance explained is 18.4%, PC2 is 8.9% and PC3 is 7.6%.

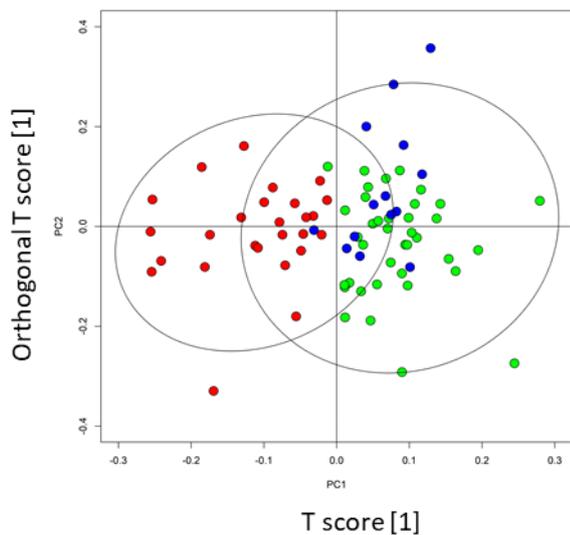
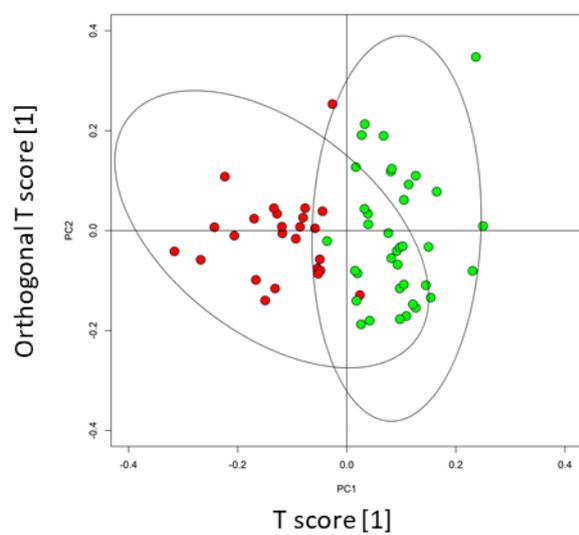
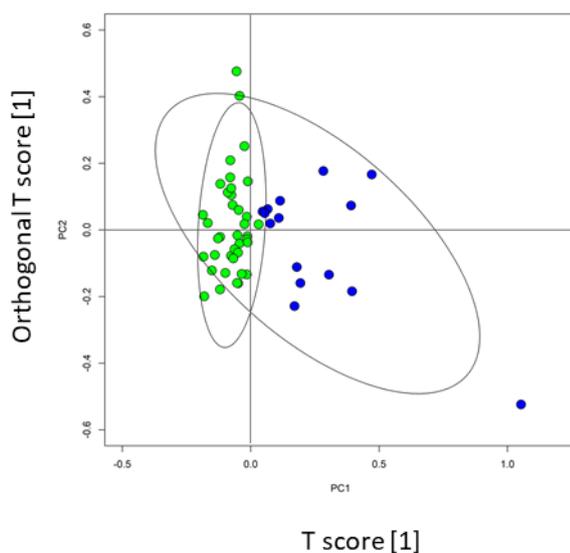
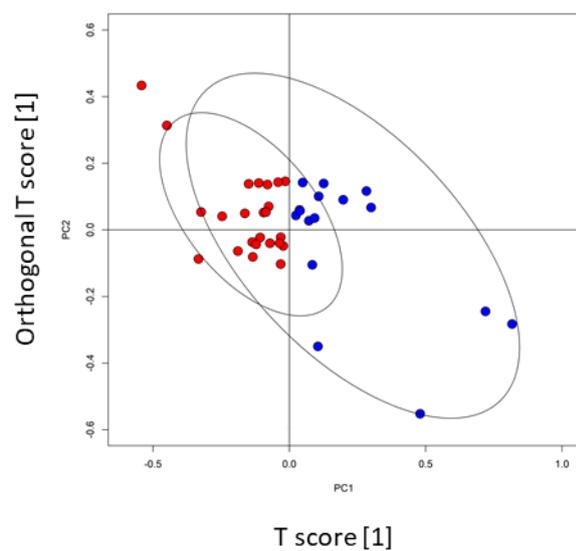
A

	HS	CRC	AP
HS	93.9	5.7	0.5
CRC	12.7	66.6	20.7
AP	36.4	25.8	37.8
Accuracy 74.2 %			

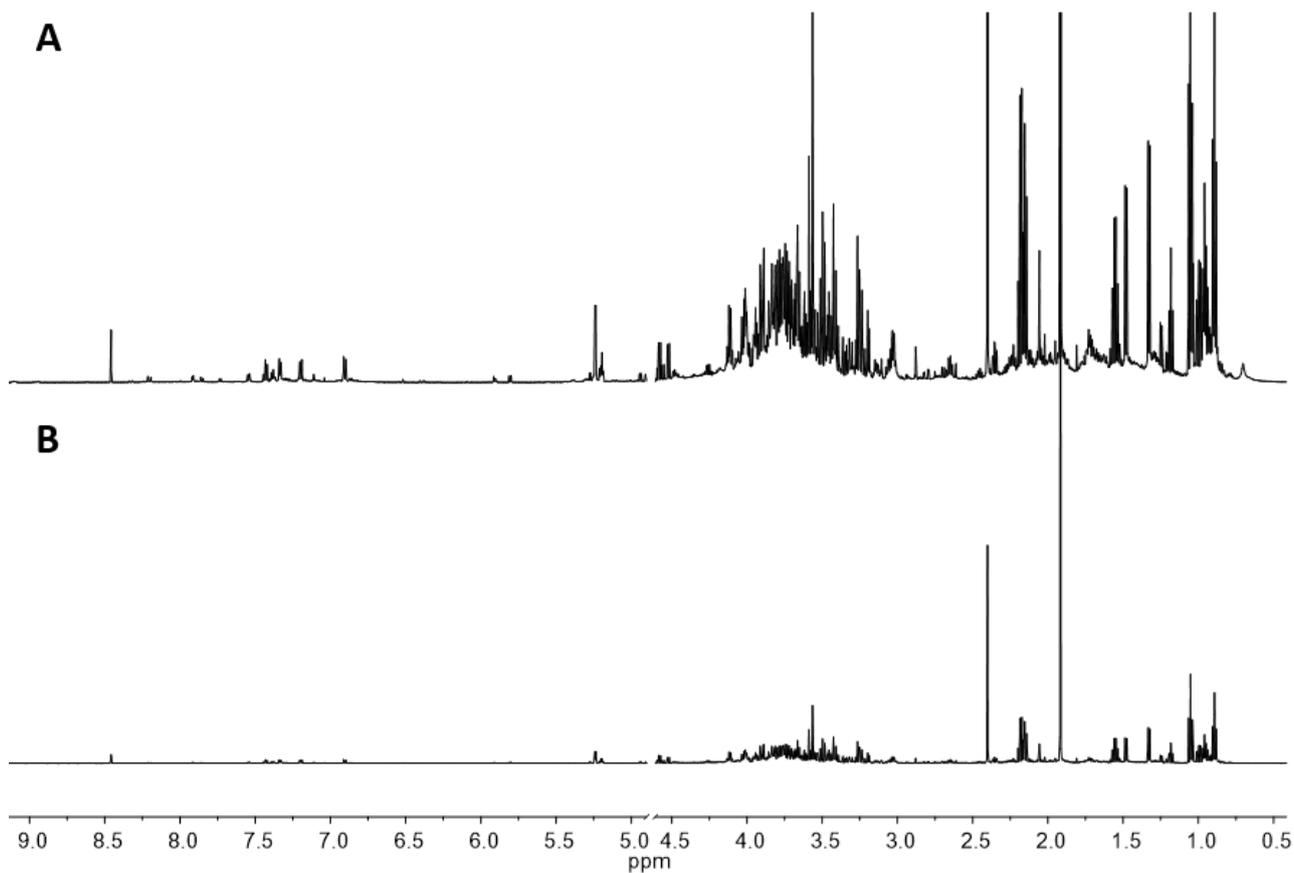
B

	HS	CRC	AP
HS	91.1	5.1	3.8
CRC	19.6	69.4	11
AP	60.5	21.4	18
Accuracy 70.7 %			

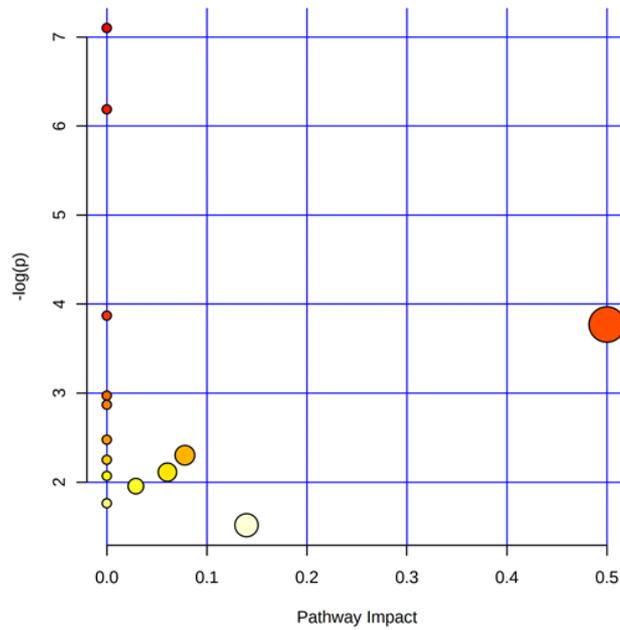
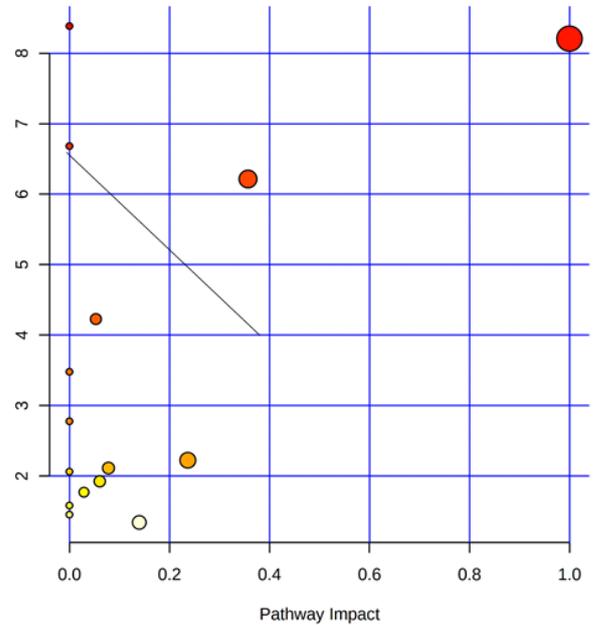
Supplementary Figure 2 Orthogonal projections to latent structures-discriminant analysis models of 1d one-dimensional proton nuclear magnetic resonance fecal water bucketed spectra of healthy, colorectal cancer patients (red dots) and adenomatous patients (blue dots). Score plots of OPLS-DA, discriminating HS (green dots), CRC (red dots) and AP (blue dots) patients; A: 1D noesy experiment; B: CPMG experiment. Confusion matrix and predictive accuracy of Monte Carlo cross-validation are also reported for both models.

A**B****C****D**

Supplementary Figure 3 Orthogonal projections to latent structures-discriminant analysis models of 1d one-dimensional proton nuclear magnetic resonance R fecal extract spectra (A-D) of healthy (healthy controls, green dots) and diseased subjects (colorectal cancer, red dots and polyp, blue dots). A: OPLS-DA score plot of bucketed 1D noesy fecal extract spectra based on healthy controls ($n = 38$) vs AP and CRC patients ($n = 41$); B: OPLS-DA score plot of bucketed 1D noesy fecal extract spectra based on healthy controls ($n = 38$) and CRC ($n = 26$); C: OPLS-DA score plot of bucketed 1D noesy fecal extract spectra based on healthy controls and AP ($n = 15$); D: OPLS-DA score plot of bucketed 1D noesy fecal extract spectra based on AP and CRC.



Supplementary Figure 4 Representative one-dimensional proton nuclear magnetic resonance spectra acquired at 600 MHz. Human fecal extract sample acquired with 1D noesy pulse sequence (A) and CPMG (B). The residual water peak region (4.5-5 ppm) is not shown.

A**B**

Supplementary Figure 5 Pathway analyses from serum and fecal extract samples. Pictures of most contributing biochemical pathways obtained from MetaboAnalyst 4.0, showing the pathway impact on the x-axis and the negative $\log(P)$ on the y-axis. The most relevant pathways identified considering the list of significantly altered fecal metabolites in polyp (A) and CRC patients CRC (B).

Supplementary Table 1 Fecal extract metabolites

Fecal extract metabolites (arbitrary units)							
Metabolites	Chemical shift of the considered integral (δ , multiplicity)	HS		CRC		polyp	
		Median	\pm MAD	Median	\pm MAD	Median	\pm MAD
2-methylbutyrate	0.86 (t)	5.40	3.61	3.60	3.66	2.12	3.09
Butyrate	1.54 (m)	71.29	65.81	50.30	40.71	11.98	13.55
Leucine	0.95 (t)	57.82	37.89	96.92	80.17	38.28	34.43
Isoleucine	1.00 (d)	9.23	5.05	12.97	8.83	7.72	7.79
Propionate	1.04 (t)	102.29	39.70	72.25	55.06	40.20	39.53
Alanine	1.48 (d)	29.83	18.16	44.91	26.10	25.65	25.38
Thymine	1.87 (s)	4.27	3.42	2.11	2.43	4.38	2.59
Acetate	1.92 (s)	1263.57	461.66	633.58	348.93	394.14	396.16
Isovalerate	0.90 (d)	6.17	4.16	9.08	7.07	3.11	4.54
Isobutyrate	2.5 (m)	4.34	2.00	2.88	2.66	2.34	1.58
Methanole	3.34 (s)	5.71	6.67	1.22	1.30	1.65	1.62
Phenylacetate	7.32 (m)	10.39	8.01	8.79	7.94	3.82	4.90
Proline	4.10 (dd)	0.64	0.26	0.89	0.70	0.60	0.24
Valine	0.99 (d)	11.58	8.74	21.09	10.32	10.54	10.91
Succinate	2.40 (s)	26.64	9.87	34.90	30.86	28.13	14.93
Glutamate	2.34 (m)	16.94	8.53	12.69	8.77	10.44	9.81
Malonate	3.13 (s)	5.37	3.44	3.74	2.58	3.72	2.32
Methionine	2.64 (t)	1.74	1.24	2.05	1.27	1.45	1.44
Aspartate	2.85 (m)	4.76	2.02	6.16	5.50	3.07	2.76
Glucose	3.52 (m)	23.33	14.95	17.02	9.20	15.40	9.47
Lactate + Threonine	1.3 (d+d)	9.39	5.98	11.33	6.16	6.47	4.65
Glycerol	3.66 (m)	14.34	13.08	265.96	373.12	14.90	16.36

Xylose	3.33 (m)	2.06	1.30	1.19	0.76	1.27	1.23
Uracil	5.8 (d)	5.47	3.70	4.30	3.02	4.34	4.69
Galactose	5.28 (d)	0.41	0.41	0.17	0.26	0.22	0.33
Fumarate	6.52 (s)	1.26	0.90	1.17	0.96	0.75	0.76
Tyrosine	6.91 (d)	9.61	5.72	13.50	7.48	6.72	5.75
Phenylalanine	7.44 (m)	7.56	4.48	13.29	9.56	8.35	6.33
Formate	8.46 (s)	1.42	0.46	1.78	1.02	1.24	1.05
Nicotinate	8.95 (s)	1.11	0.34	0.73	0.49	0.67	0.56
Urocanate	6.40 (d)	0.42	0.26	0.46	0.39	0.21	0.19
3-hydroxyphenylacetate	7.26 (t)	1.35	2.00	0.03	0.04	0.09	0.13
Orotate	6.19 (s)	0.23	0.10	0.22	0.15	0.20	0.11

Chemical shifts of the identified metabolites are reported. Median and mean absolute deviation (MAD) are reported for each variable in healthy subjects (HS), CRC (patients with colorectal cancer) and polyposis patients (polyp). Concentrations expressed in arbitrary units.