



**Figure S1.** Hierarchical cluster analysis (I) and correlations (II) among the identified plasma (A) and saliva (B) metabolites.

**Table S1.** Pearson correlation among plasmatic metabolites and co-variables related to BMI and periodontal parameters.

Metabolites (chemical shift – ppm)		BMI	PPD	CAL	PS	Dental plaque	BOP
<b>Cholesterol (0.59)</b>	Pearson Correlation	0.002	<b>-0.208*</b>	-0.191	-0.123	-0.078	0.062
	Sig. (2-tailed)	0.987	<b>0.040</b>	0.060	0.227	0.443	0.542
<b>Leucine (0.96)</b>	Pearson Correlation	0.116	<b>-0.205*</b>	<b>-0.211*</b>	<b>-0.204*</b>	-0.039	0.040
	Sig. (2-tailed)	0.254	<b>0.042</b>	<b>0.037</b>	<b>0.044</b>	0.701	0.699
Valine (0.98)	Pearson Correlation	0.012	-0.145	-0.157	-0.167	0.003	0.001
	Sig. (2-tailed)	0.909	0.154	0.124	0.100	0.979	0.992
<b>Isoleucine (1.01)</b>	Pearson Correlation	-0.160	<b>-0.241*</b>	<b>-0.255*</b>	<b>-0.246*</b>	-0.143	-0.100
	Sig. (2-tailed)	0.115	<b>0.017</b>	<b>0.011</b>	<b>0.015</b>	0.160	0.329
<b>Propionic acid (1.07)</b>	Pearson Correlation	-0.053	-0.185	-0.191	<b>-0.250*</b>	-0.123	-0.128
	Sig. (2-tailed)	0.604	0.069	0.059	<b>0.013</b>	0.229	0.209
2,3-Butanediol (1.14)	Pearson Correlation	-0.016	-0.126	-0.129	-0.121	-0.013	-0.090
	Sig. (2-tailed)	0.874	0.217	0.206	0.234	0.895	0.377
Fatty acids (1.17)	Pearson Correlation	-0.114	-0.132	-0.114	-0.048	-0.090	0.108
	Sig. (2-tailed)	0.263	0.195	0.263	0.639	0.379	0.289
Ethanol (1.17)	Pearson Correlation	0.045	-0.125	-0.124	-0.163	-0.122	-0.121
	Sig. (2-tailed)	0.662	0.220	0.223	0.109	0.231	0.235
<b>3-Hydroxybutyric acid (1.20)</b>	Pearson Correlation	-0.096	-0.198	-0.186	<b>-0.207*</b>	0.000	-0.158
	Sig. (2-tailed)	0.347	0.050	0.066	<b>0.041</b>	0.998	0.121
Alanine (1.48)	Pearson Correlation	0.016	0.029	0.003	0.009	0.023	0.126
	Sig. (2-tailed)	0.876	0.775	0.973	0.931	0.821	0.217
Acetic acid (1.92)	Pearson Correlation	-0.126	0.039	0.025	-0.057	-0.051	0.034
	Sig. (2-tailed)	0.215	0.706	0.808	0.574	0.619	0.743
Acetone (2.22)	Pearson Correlation	-0.181	-0.182	-0.171	-0.113	-0.119	-0.017
	Sig. (2-tailed)	0.075	0.073	0.093	0.270	0.242	0.867
<b>Acetoacetic acid (2.27)</b>	Pearson Correlation	-0.031	<b>-0.214*</b>	<b>-0.202*</b>	<b>-0.241*</b>	0.025	-0.177
	Sig. (2-tailed)	0.764	<b>0.034</b>	<b>0.046</b>	<b>0.017</b>	0.809	0.080
Pyruvate (2.37)	Pearson Correlation	-0.027	-0.056	-0.068	-0.041	-0.039	-0.104
	Sig. (2-tailed)	0.791	0.587	0.505	0.686	0.705	0.310
Glutamic acid (2.34)	Pearson Correlation	-0.022	0.059	0.067	0.104	0.063	0.165
	Sig. (2-tailed)	0.827	0.565	0.512	0.309	0.539	0.104
Glutamine (2.45)	Pearson Correlation	0.178	-0.108	-0.106	-0.168	0.101	-0.072
	Sig. (2-tailed)	0.079	0.292	0.297	0.098	0.324	0.483
Citric acid (2.53)	Pearson Correlation	-0.171	-0.095	-0.064	-0.066	-0.039	-0.058
	Sig. (2-tailed)	0.092	0.353	0.531	0.516	0.702	0.573
Polyunsaturated fatty acids (2.63)	Pearson Correlation	-0.057	-0.110	-0.100	-0.034	-0.068	0.092
	Sig. (2-tailed)	0.578	0.280	0.329	0.740	0.508	0.370
Asparagine (2.87)	Pearson Correlation	0.092	-0.096	-0.104	-0.184	0.015	-0.090
	Sig. (2-tailed)	0.366	0.348	0.308	0.069	0.886	0.380
<b>Lysine (3.02)</b>	Pearson Correlation	-0.035	-0.147	-0.150	<b>-0.237*</b>	0.019	-0.114
	Sig. (2-tailed)	0.735	0.149	0.141	<b>0.019</b>	0.850	0.265
Ornithine (3.05)	Pearson Correlation	0.112	-0.118	-0.084	-0.128	0.035	-0.098
	Sig. (2-tailed)	0.272	0.249	0.411	0.211	0.730	0.338
Choline (3.10)	Pearson Correlation	-0.048	0.050	0.051	-0.029	0.143	0.071
	Sig. (2-tailed)	0.641	0.622	0.621	0.775	0.160	0.485
Glycine (3.56)	Pearson Correlation	0.195	-0.017	0.020	-0.060	0.000	-0.038
	Sig. (2-tailed)	0.054	0.871	0.848	0.559	0.998	0.712
Creatine (3.95)	Pearson Correlation	0.058	-0.110	-0.077	-0.134	-0.027	-0.129

	Sig. (2-tailed)	0.573	0.281	0.451	0.189	0.789	0.206
Creatine phosphate (3.96)	Pearson Correlation	0.109	-0.067	-0.025	-0.103	0.012	-0.108
	Sig. (2-tailed)	0.287	0.515	0.804	0.314	0.910	0.290
Lactate (4.11)	Pearson Correlation	-0.100	0.118	0.096	0.074	0.042	0.077
	Sig. (2-tailed)	0.327	0.249	0.345	0.472	0.679	0.453
Proline (4.15)	Pearson Correlation	-0.051	-0.168	-0.151	-0.175	0.043	-0.163
	Sig. (2-tailed)	0.617	0.098	0.137	0.085	0.671	0.108
Threonine (4.25)	Pearson Correlation	-0.150	-0.157	-0.138	-0.172	0.042	-0.045
	Sig. (2-tailed)	0.141	0.122	0.175	0.090	0.679	0.663
<b>Glucose (4.65)</b>	Pearson Correlation	0.042	<b>0.239*</b>	<b>0.207*</b>	0.175	-0.058	0.115
	Sig. (2-tailed)	0.679	<b>0.018</b>	<b>0.041</b>	0.085	0.573	0.259
Triglycerides (5.08)	Pearson Correlation	-0.129	-0.111	-0.098	-0.025	-0.083	0.135
	Sig. (2-tailed)	0.206	0.276	0.338	0.810	0.417	0.187
Unsaturated fatty acids (5.20)	Pearson Correlation	-0.069	-0.121	-0.108	-0.038	-0.074	0.106
	Sig. (2-tailed)	0.500	0.235	0.291	0.712	0.471	0.297
Tyrosine (6.90)	Pearson Correlation	-0.043	0.013	0.014	-0.030	0.109	0.054
	Sig. (2-tailed)	0.673	0.895	0.889	0.766	0.284	0.597
<b>Histidine (7.08)</b>	Pearson Correlation	0.186	-0.183	-0.167	<b>-0.200*</b>	-0.021	-0.077
	Sig. (2-tailed)	0.067	0.071	0.100	<b>0.049</b>	0.836	0.453
<b>Phenylalanine (7.42)</b>	Pearson Correlation	<b>0.245*</b>	0.074	0.092	0.115	0.013	0.110
	Sig. (2-tailed)	<b>0.015</b>	0.466	0.366	0.258	0.901	0.282
<b>Formate (8.45)</b>	Pearson Correlation	<b>-0.215*</b>	0.120	0.127	0.123	0.125	0.073
	Sig. (2-tailed)	<b>0.033</b>	0.240	0.213	0.228	0.221	0.473

BMI, body mass index; PPD, probing pocket depth; CAL, clinical attachment level; PS, periodontitis stages; BOP, bleeding on probing; \* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed). Metabolite names and values in bold represent statistical difference ( $p < 0.05$ ).

**Table S2.** Pearson correlation among the salivary metabolites and co-variables related to BMI and periodontal parameters.

Metabolites (chemical shift - ppm)		BMI	PPD	CAL	PS	Dental plaque	BOP
3-Methyl-2-ketovaleric acid (0.85)	Pearson Correlation	-0.142	<b>0.472**</b>	<b>0.514**</b>	<b>0.415**</b>	<b>0.225*</b>	<b>0.424**</b>
	Sig. (2-tailed)	0.164	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.026</b>	<b>&lt;0.001</b>
Unknown 1 (0.87)	Pearson Correlation	-0.185	<b>0.591**</b>	<b>0.614**</b>	<b>0.490**</b>	<b>0.284**</b>	<b>0.522**</b>
	Sig. (2-tailed)	0.068	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.005</b>	<b>&lt;0.001</b>
Butyric acid (0.89)	Pearson Correlation	-0.006	<b>0.636**</b>	<b>0.637**</b>	<b>0.510**</b>	<b>0.412**</b>	<b>0.522**</b>
	Sig. (2-tailed)	0.956	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Isovaleric acid (0.91)	Pearson Correlation	-0.083	<b>0.556**</b>	<b>0.562**</b>	<b>0.467**</b>	<b>0.374**</b>	<b>0.550**</b>
	Sig. (2-tailed)	0.418	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Leucine (0.97)	Pearson Correlation	-0.055	<b>0.525**</b>	<b>0.547**</b>	<b>0.429**</b>	<b>0.266**</b>	<b>0.449**</b>
	Sig. (2-tailed)	0.592	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.008</b>	<b>&lt;0.001</b>
Valine (0.99)	Pearson Correlation	-0.038	<b>0.525**</b>	<b>0.531**</b>	<b>0.425**</b>	<b>0.262**</b>	<b>0.463**</b>
	Sig. (2-tailed)	0.708	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.009</b>	<b>&lt;0.001</b>
Isoleucine (1.01)	Pearson Correlation	-0.016	<b>0.438**</b>	<b>0.436**</b>	<b>0.331**</b>	<b>0.238*</b>	<b>0.402**</b>
	Sig. (2-tailed)	0.879	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.001</b>	<b>0.018</b>	<b>&lt;0.001</b>
Propionic acid (1.06)	Pearson Correlation	0.174	<b>0.409**</b>	<b>0.387**</b>	<b>0.320**</b>	<b>0.454**</b>	<b>0.402**</b>
	Sig. (2-tailed)	0.086	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
2,3-Butanediol (1.14)	Pearson Correlation	<b>0.234*</b>	-0.079	-0.077	-0.043	-0.006	0.012
	Sig. (2-tailed)	<b>0.020</b>	0.442	0.453	0.677	0.952	0.904
Ethanol (1.18)	Pearson Correlation	0.122	-0.016	-0.019	-0.032	0.023	0.001
	Sig. (2-tailed)	0.231	0.874	0.855	0.752	0.825	0.992
Fucose (1.25)	Pearson Correlation	0.007	0.118	0.105	0.013	0.102	0.091
	Sig. (2-tailed)	0.948	0.248	0.305	0.895	0.317	0.371
Acetoin (1.38)	Pearson Correlation	0.144	0.099	0.109	0.084	0.064	0.136
	Sig. (2-tailed)	0.157	0.334	0.286	0.413	0.533	0.183
Alanine (1.48)	Pearson Correlation	-0.057	<b>0.292**</b>	<b>0.330**</b>	0.169	0.133	0.194
	Sig. (2-tailed)	0.579	<b>0.004</b>	<b>0.001</b>	0.096	0.192	0.055
Putrescine (1.76)	Pearson Correlation	0.040	<b>0.324**</b>	<b>0.330**</b>	<b>0.221*</b>	<b>0.304**</b>	<b>0.292**</b>
	Sig. (2-tailed)	0.692	<b>0.001</b>	<b>0.001</b>	<b>0.029</b>	<b>0.002</b>	<b>0.004</b>
Acetic acid (1.92)	Pearson Correlation	0.084	<b>0.302**</b>	<b>0.281**</b>	<b>0.228*</b>	<b>0.329**</b>	<b>0.332**</b>
	Sig. (2-tailed)	0.411	<b>0.003</b>	<b>0.005</b>	<b>0.024</b>	<b>0.001</b>	<b>0.001</b>
N-acetylneuraminic acid (2.21)	Pearson Correlation	-0.023	<b>0.327**</b>	<b>0.332**</b>	<b>0.224*</b>	<b>0.254*</b>	<b>0.276**</b>
	Sig. (2-tailed)	0.824	<b>0.001</b>	<b>0.001</b>	<b>0.027</b>	<b>0.012</b>	<b>0.006</b>
5-Aminopentoate (2.24)	Pearson Correlation	0.078	0.163	0.162	0.064	<b>0.220*</b>	0.177
	Sig. (2-tailed)	0.446	0.108	0.112	0.530	<b>0.029</b>	0.081
N-acetylglutamine (2.33)	Pearson Correlation	-0.081	-0.004	0.056	-0.072	0.040	-0.067
	Sig. (2-tailed)	0.428	0.972	0.583	0.484	0.693	0.509
Pyruvic acid (2.37)	Pearson Correlation	0.049	<b>&lt;0.001</b>	0.044	-0.066	-0.044	-0.074
	Sig. (2-tailed)	0.634	0.998	0.665	0.518	0.667	0.469
Succinic acid (2.41)	Pearson Correlation	<b>0.245*</b>	0.092	0.129	0.069	0.026	0.050
	Sig. (2-tailed)	<b>0.015</b>	0.369	0.205	0.500	0.796	0.628
Unknown 2 (2.49)	Pearson Correlation	-0.117	<b>0.442**</b>	<b>0.474**</b>	<b>0.328**</b>	<b>0.231*</b>	<b>0.373**</b>
	Sig. (2-tailed)	0.249	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.001</b>	<b>0.022</b>	<b>&lt;0.001</b>
Citric acid (2.53)	Pearson Correlation	-0.025	-0.031	0.038	-0.018	-0.021	-0.022
	Sig. (2-tailed)	0.807	0.761	0.709	0.863	0.838	0.830
Methylamine (2.60)	Pearson Correlation	-0.141	<b>0.291**</b>	<b>0.303**</b>	0.189	0.122	<b>0.290**</b>
	Sig. (2-tailed)	0.165	<b>0.004</b>	<b>0.002</b>	0.062	0.232	<b>0.004</b>
Trimethylamine (2.89)	Pearson Correlation	-0.113	<b>0.555**</b>	<b>0.556**</b>	<b>0.455**</b>	<b>0.298**</b>	<b>0.568**</b>

	Sig. (2-tailed)	0.269	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.003</b>	<b>&lt;0.001</b>
Ornithine (3.06)	Pearson Correlation	0.050	<b>0.345**</b>	<b>0.353**</b>	<b>0.254*</b>	<b>0.289**</b>	<b>0.301**</b>
	Sig. (2-tailed)	0.627	<b>0.001</b>	<b>&lt;0.001</b>	<b>0.012</b>	<b>0.004</b>	<b>0.003</b>
Choline (3.20)	Pearson Correlation	-0.143	<b>0.246*</b>	<b>0.279**</b>	<b>0.206*</b>	0.036	<b>0.277**</b>
	Sig. (2-tailed)	0.159	<b>0.015</b>	<b>0.005</b>	<b>0.042</b>	0.722	<b>0.006</b>
Citrulline (3.14)	Pearson Correlation	-0.058	0.107	0.101	0.031	0.032	0.116
	Sig. (2-tailed)	0.570	0.293	0.322	0.762	0.755	0.257
Dimethylsulfone (3.15)	Pearson Correlation	-0.024	-0.044	-0.045	-0.008	-0.059	0.017
	Sig. (2-tailed)	0.817	0.666	0.661	0.941	0.562	0.869
Methanol (3.36)	Pearson Correlation	-0.084	-0.082	-0.082	-0.100	-0.057	-0.125
	Sig. (2-tailed)	0.410	0.421	0.422	0.327	0.578	0.220
Taurine (3.43)	Pearson Correlation	0.083	<b>0.274**</b>	<b>0.289**</b>	0.181	0.075	<b>0.279**</b>
	Sig. (2-tailed)	0.415	<b>0.006</b>	<b>0.004</b>	0.075	0.463	<b>0.005</b>
Glycine (3.56)	Pearson Correlation	<b>0.246*</b>	-0.065	-0.026	-0.074	0.108	0.028
	Sig. (2-tailed)	<b>0.015</b>	0.523	0.797	0.471	0.290	0.787
Lactate (4.12)	Pearson Correlation	<b>0.225*</b>	-0.010	0.003	-0.059	-0.111	0.014
	Sig. (2-tailed)	<b>0.026</b>	0.923	0.974	0.564	0.278	0.892
Proline (4.14)	Pearson Correlation	-0.038	-0.070	-0.053	-0.142	0.020	-0.080
	Sig. (2-tailed)	0.708	0.496	0.601	0.163	0.843	0.434
Glucose (5.24)	Pearson Correlation	0.183	-0.021	0.008	-0.047	-0.028	0.074
	Sig. (2-tailed)	0.071	0.836	0.941	0.646	0.786	0.470
Unknown sugar (5.27)	Pearson Correlation	0.044	-0.131	-0.144	<b>-0.250*</b>	-0.008	-0.082
	Sig. (2-tailed)	0.666	0.198	0.157	<b>0.013</b>	0.938	0.420
Maltose (5.41)	Pearson Correlation	<b>0.215*</b>	-0.098	-0.061	-0.067	0.025	0.042
	Sig. (2-tailed)	<b>0.033</b>	0.339	0.549	0.512	0.811	0.680
Urea (5.78)	Pearson Correlation	-0.055	-0.162	-0.145	-0.075	<b>-0.351**</b>	-0.160
	Sig. (2-tailed)	0.593	0.111	0.154	0.465	<b>&lt;0.001</b>	0.115
Uridine (5.91)	Pearson Correlation	-0.085	-0.131	-0.119	-0.129	<b>-0.397**</b>	-0.126
	Sig. (2-tailed)	0.404	0.200	0.243	0.205	<b>&lt;0.001</b>	0.216
Fumaric acid (6.52)	Pearson Correlation	0.110	0.017	0.050	-0.020	-0.099	-0.002
	Sig. (2-tailed)	0.279	0.870	0.628	0.844	0.333	0.982
Unknown 3 (6.84)	Pearson Correlation	-0.055	<b>0.292**</b>	<b>0.317**</b>	<b>0.256*</b>	0.187	<b>0.223*</b>
	Sig. (2-tailed)	0.588	<b>0.004</b>	<b>0.001</b>	<b>0.011</b>	0.065	<b>0.028</b>
para-Hydroxyphenylacetic acid (6.87)	Pearson Correlation	0.059	0.130	0.163	0.111	0.203*	0.080
	Sig. (2-tailed)	0.567	0.203	0.108	0.277	0.045	0.433
Tyrosine (6.90)	Pearson Correlation	0.047	0.155	0.212*	0.131	0.031	0.030
	Sig. (2-tailed)	0.643	0.128	0.036	0.200	0.765	0.771
Histidine (7.07)	Pearson Correlation	0.022	0.133	0.181	0.124	0.028	0.021
	Sig. (2-tailed)	0.831	0.191	0.074	0.223	0.785	0.836
Phenylalanine (7.43)	Pearson Correlation	0.039	<b>0.389**</b>	<b>0.388**</b>	<b>0.300**</b>	0.189	<b>0.307**</b>
	Sig. (2-tailed)	0.706	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.003</b>	0.063	<b>0.002</b>
Unknown 4 (8.19)	Pearson Correlation	0.015	<b>0.287**</b>	<b>0.305**</b>	0.190	-0.113	0.141
	Sig. (2-tailed)	0.882	<b>0.004</b>	<b>0.002</b>	0.061	0.268	0.165
Unknown 5 (8.21)	Pearson Correlation	-0.031	<b>0.266**</b>	<b>0.292**</b>	0.166	-0.097	0.125
	Sig. (2-tailed)	0.760	<b>0.008</b>	<b>0.004</b>	0.102	0.340	0.218
Formic acid (8.45)	Pearson Correlation	0.133	0.071	0.059	0.152	0.080	0.010
	Sig. (2-tailed)	0.190	0.486	0.567	0.136	0.435	0.925

BMI, body mass index; PPD, probing pocket depth; CAL, clinical attachment level; PS, periodontitis stages; BOP, bleeding on probing; \* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed). Metabolite names and values in bold represent statistical difference ( $p < 0.05$ ).