

Use of Matrix Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF-MS) for detection of *Escherichia coli* in clinical urine samples

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SUPPLEMENTAL MATERIAL

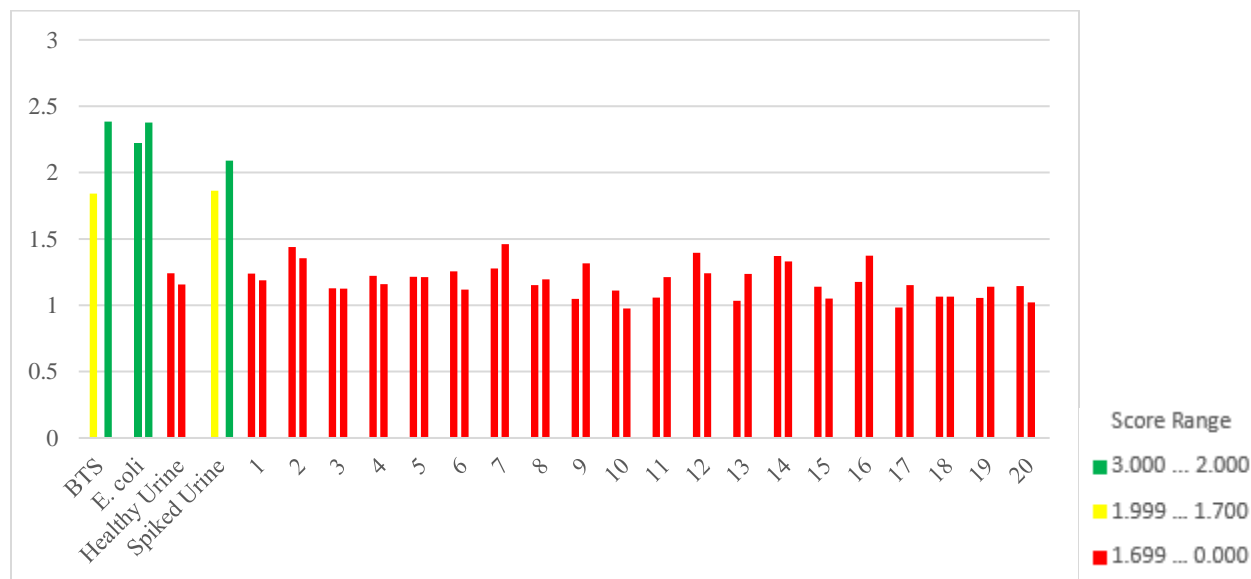


FIG. S1 Results of MALDI analysis of frozen clinical urine samples (Run 1).

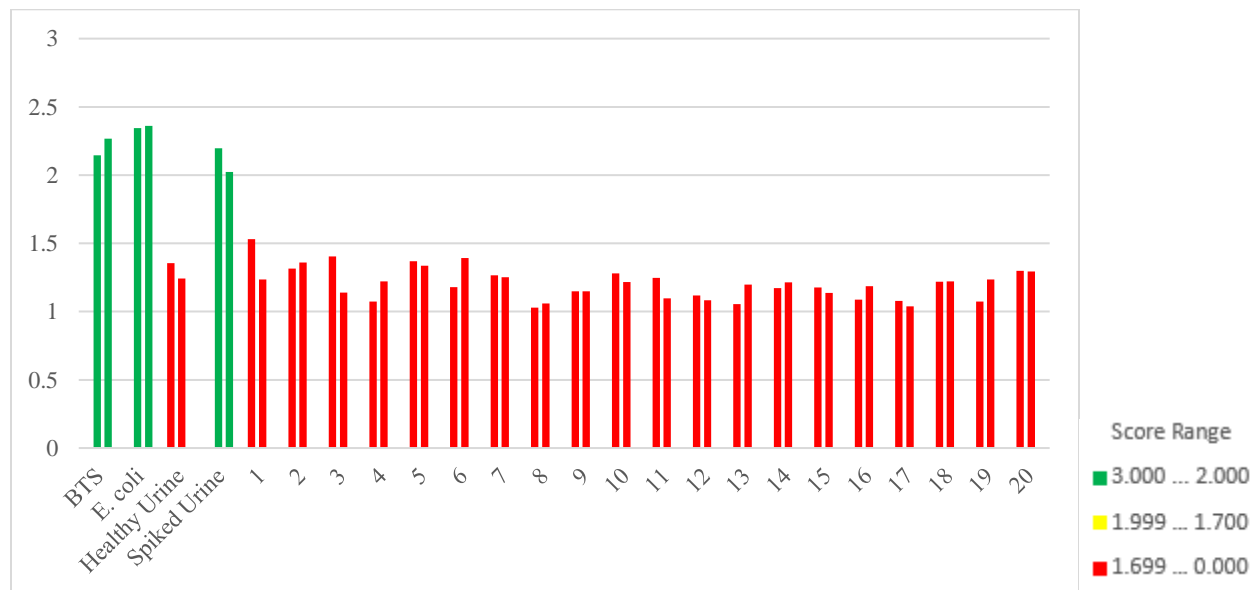


FIG. S2 Results of MALDI analysis of frozen clinical urine samples using 70% formic acid extraction (Run 2).

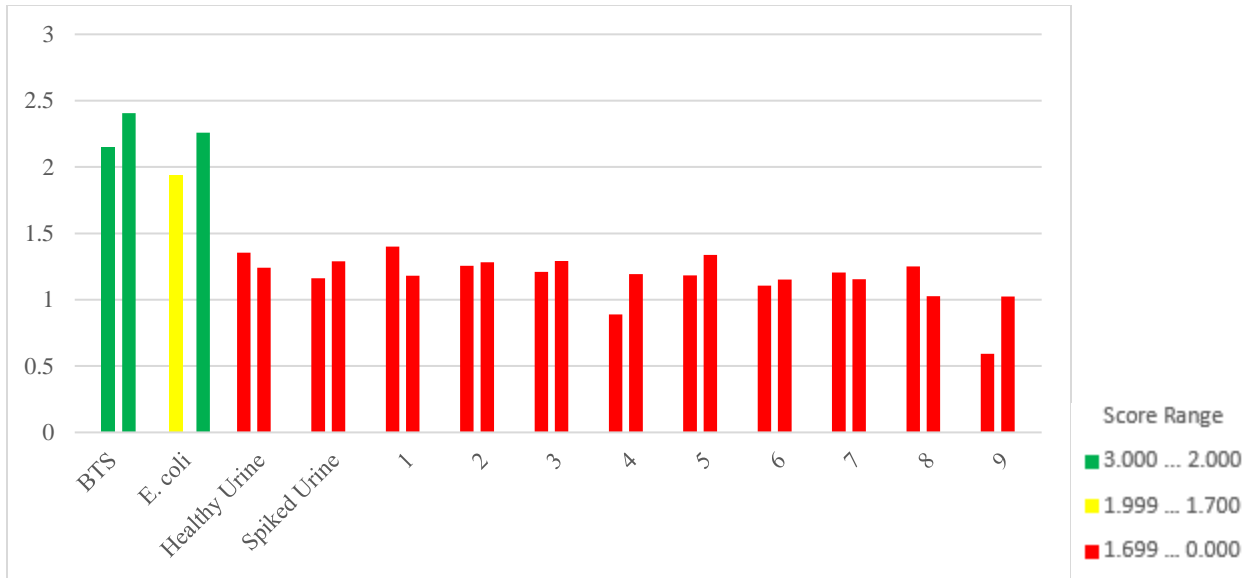


FIG. S3 Results of MALDI analysis of unfrozen clinical urine samples (Run 3).

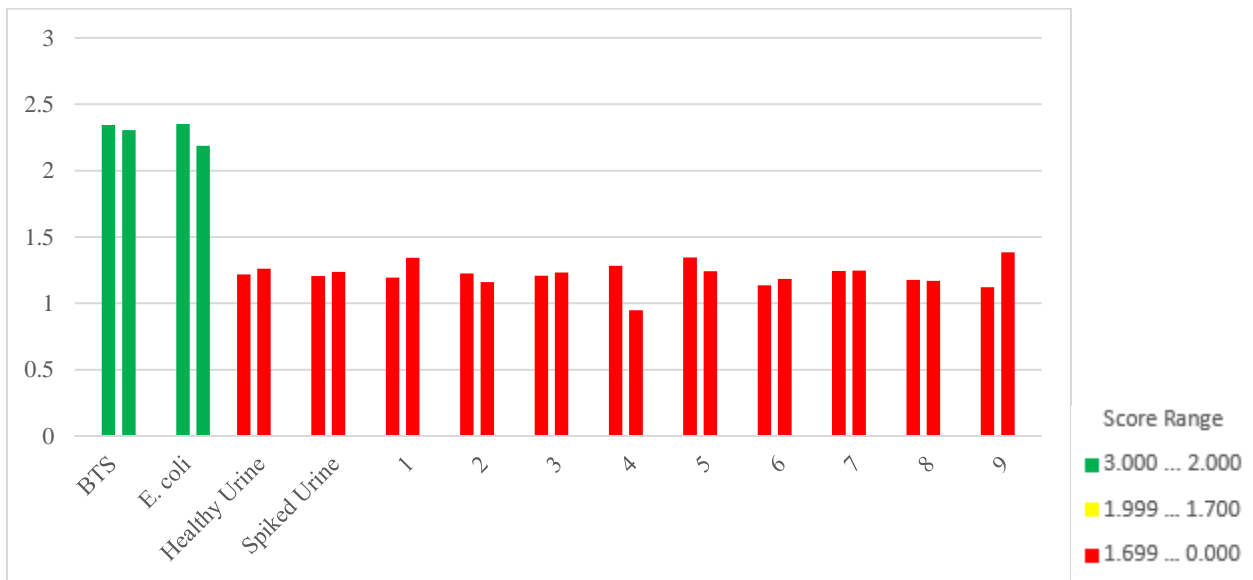


FIG. S4 Results of MALDI analysis of unfrozen clinical urine samples using 70% formic acid extraction (Run 4).

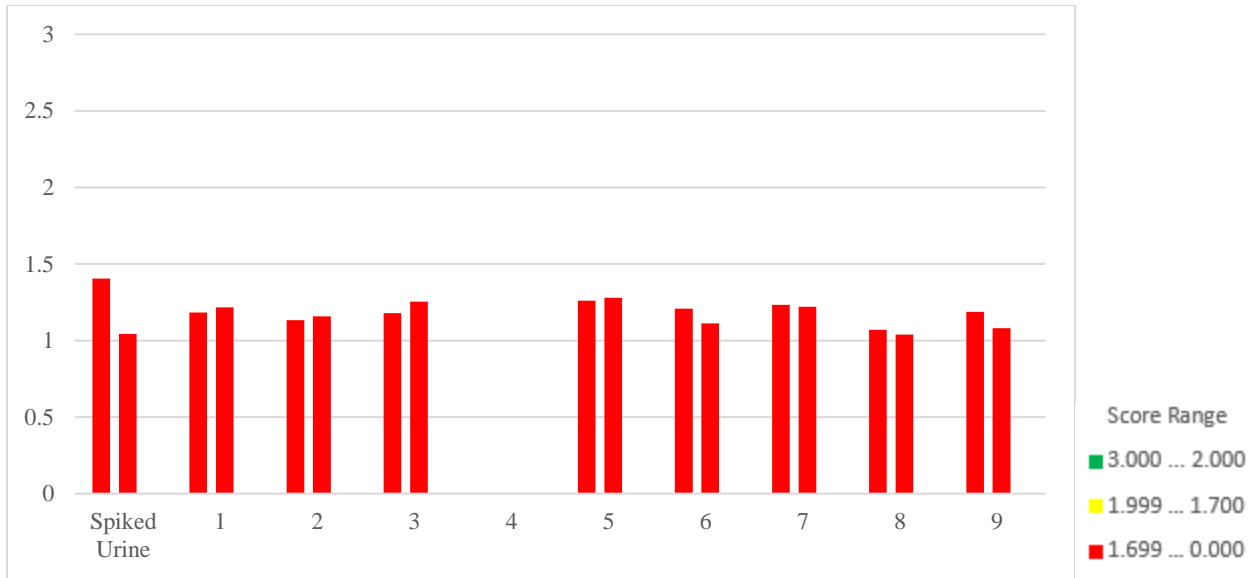


FIG. S5 Results of MALDI analysis of centrifuged unfrozen clinical urine samples (Run 5).

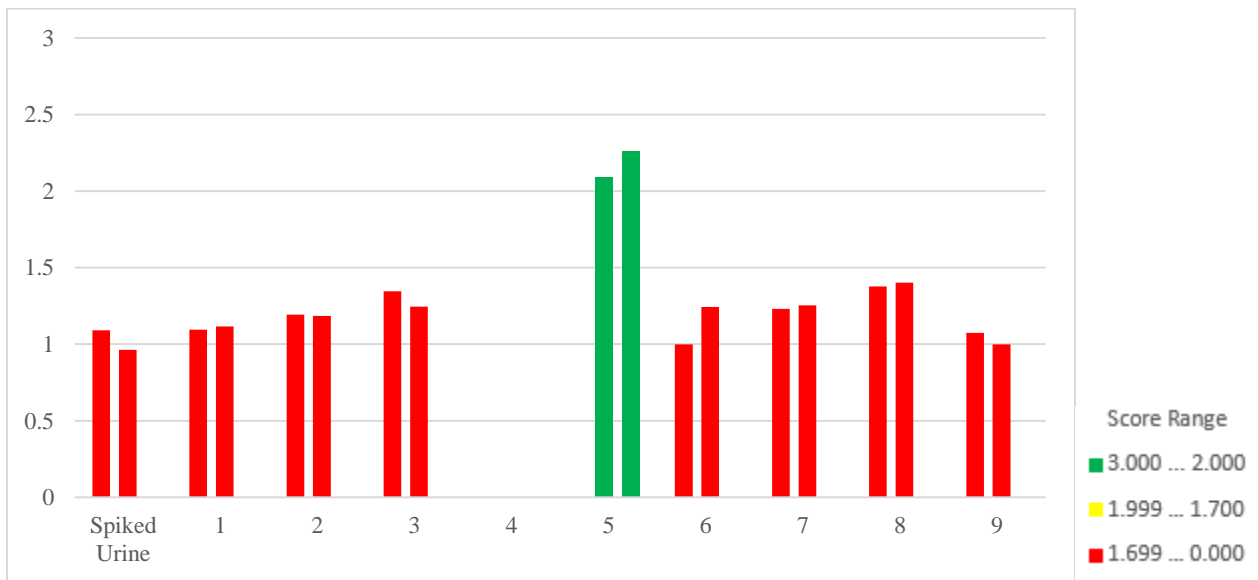


FIG. S6 Results of MALDI analysis of centrifuged unfrozen clinical urine samples using 70% formic acid extraction (Run 6).

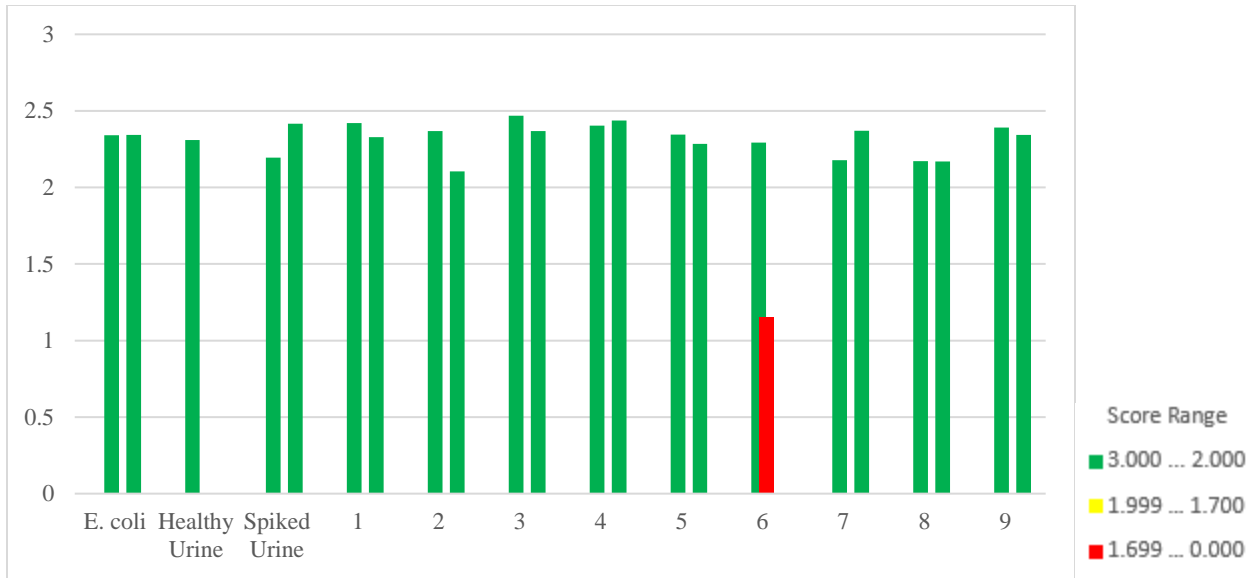


FIG. S7 Results of MALDI analysis of cultured unfrozen clinical urine samples (Run 7).

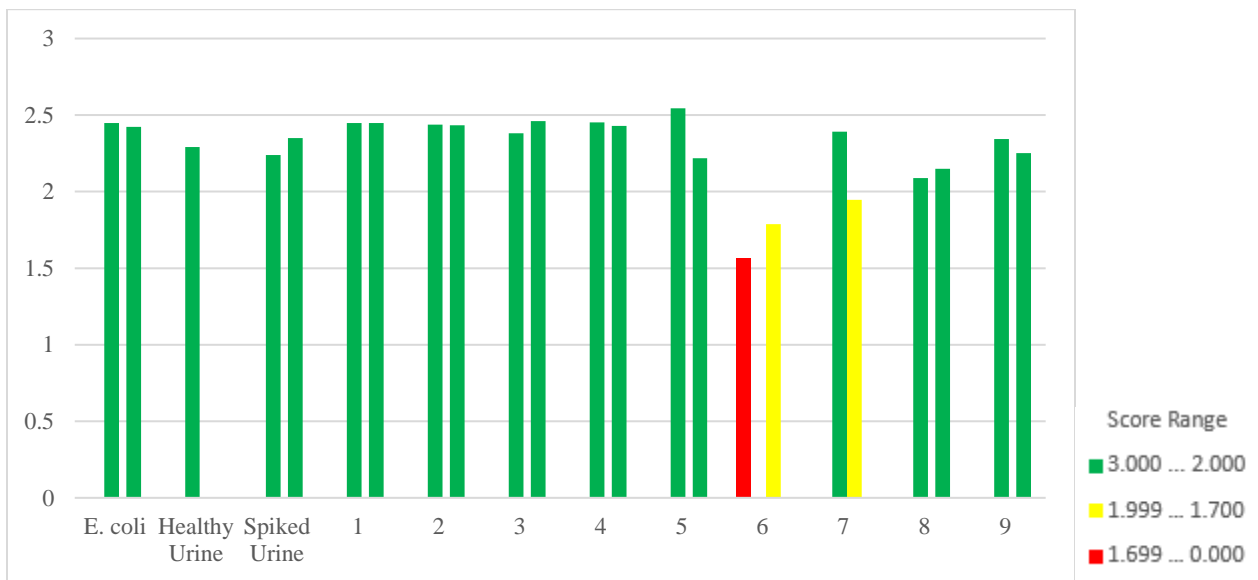


FIG. S8 Results of MALDI analysis of cultured unfrozen clinical urine samples using 70% formic acid extraction (Run 8).

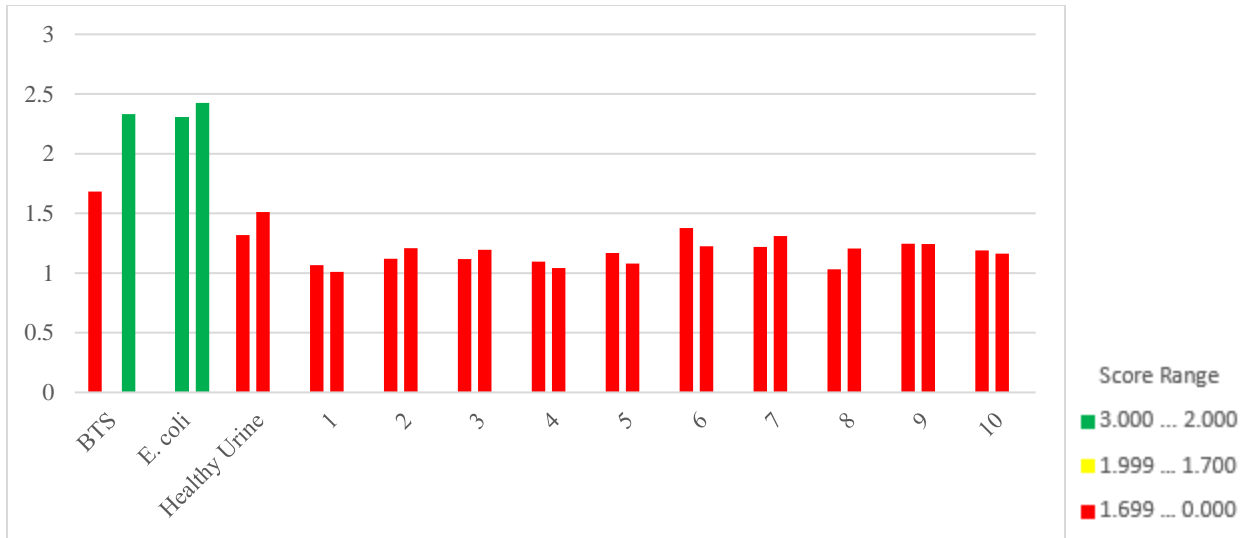


FIG. S9 Results of MALDI analysis of unfrozen clinical urine samples (Run 9).

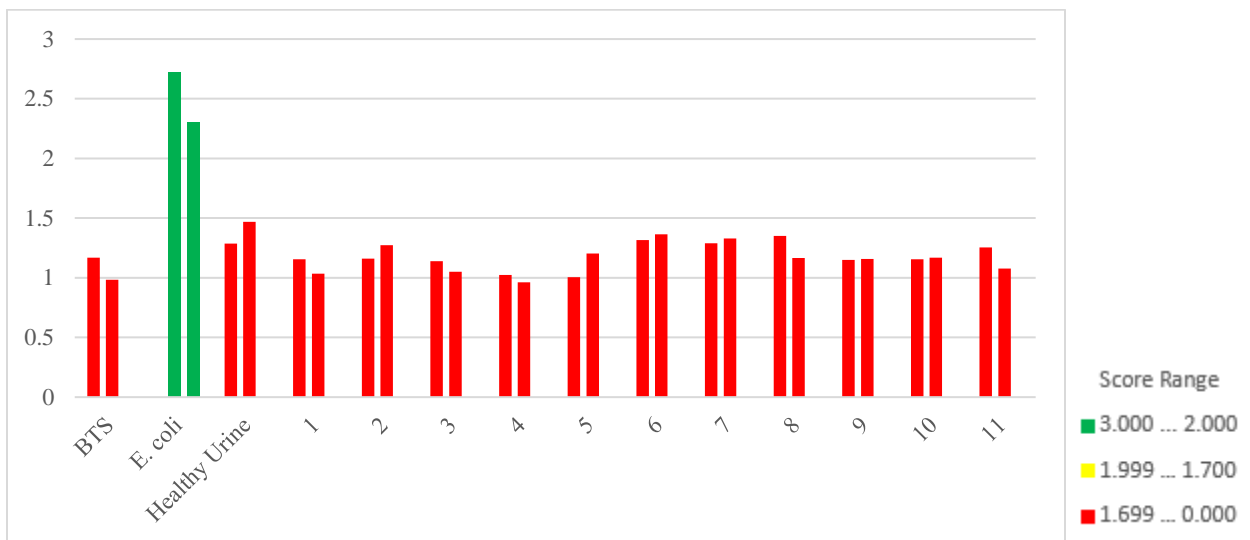


FIG. S10 Results of MALDI analysis of unfrozen clinical urine samples using 70% formic acid extraction (Run 10).

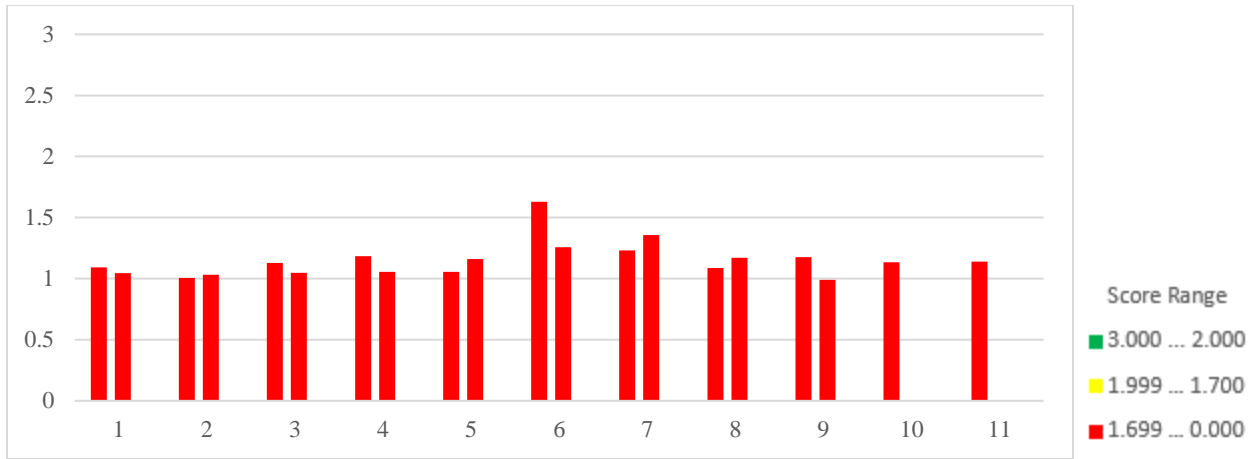


FIG. S11 Results of MALDI analysis of centrifuged unfrozen clinical urine samples (Run 11).

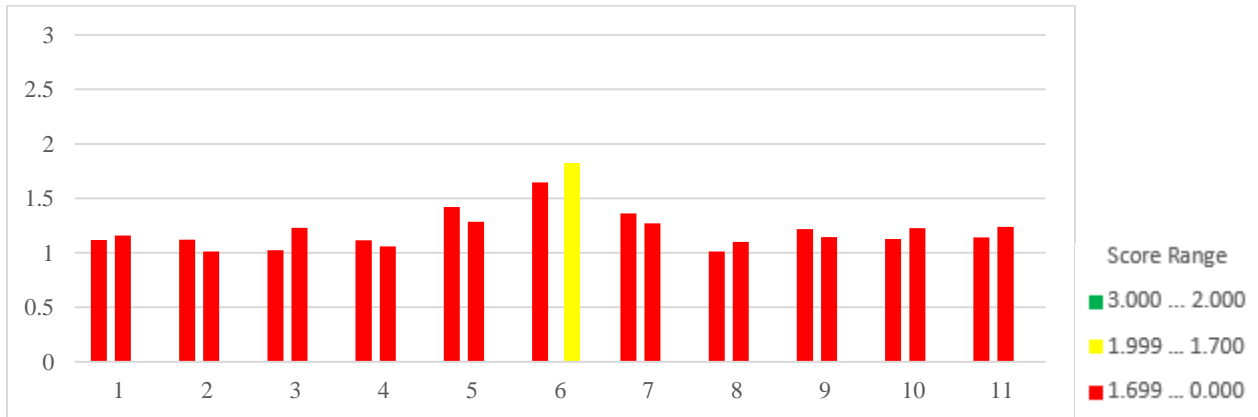


FIG. S12 Results of MALDI analysis of centrifuged unfrozen clinical urine samples using 70% formic acid extraction (Run 12).

TABLE SI Results of MALDI analysis of frozen clinical urine samples (Run 1)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
A1(+)	BTS	Escherichia coli	1.842
A2(+++)	BTS	Escherichia coli	2.385
A3(++)	Solid <i>E. coli</i>	Escherichia coli	2.221
A4(+++)	Solid <i>E. coli</i>	Escherichia coli	2.376
A5(-)	1	not reliable identification	1.24
A6(-)	1	not reliable identification	1.188
A7(-)	2	not reliable identification	1.44
A8(-)	2	not reliable identification	1.355
A9(-)	3	not reliable identification	1.128
A10(-)	3	not reliable identification	1.125
A11(-)	4	not reliable identification	1.221
A12(-)	4	not reliable identification	1.16
B1(-)	5	not reliable identification	1.215
B2(-)	5	not reliable identification	1.213
B3(-)	6	not reliable identification	1.256
B4(-)	6	not reliable identification	1.119
B5(-)	7	not reliable identification	1.277
B6(-)	7	not reliable identification	1.461
B7(-)	8	not reliable identification	1.151
B8(-)	8	not reliable identification	1.196
B9(-)	9	not reliable identification	1.048
B10(-)	9	not reliable identification	1.315
B11(-)	10	not reliable identification	1.11
B12(-)	10	not reliable identification	0.977
C1(-)	11	not reliable identification	1.059
C2(-)	11	not reliable identification	1.212
C3(-)	12	not reliable identification	1.395

C4 (-)	12	not reliable identification	1.242
C5 (-)	13	not reliable identification	1.034
C6 (-)	13	not reliable identification	1.236
C7 (-)	14	not reliable identification	1.371
C8 (-)	14	not reliable identification	1.33
C9 (-)	15	not reliable identification	1.139
C10 (-)	15	not reliable identification	1.051
C11 (-)	16	not reliable identification	1.172
C12 (-)	16	not reliable identification	1.374
D1 (-)	17	not reliable identification	0.984
D2 (-)	17	not reliable identification	1.153
D3 (-)	18	not reliable identification	1.065
D4 (-)	18	not reliable identification	1.064
D5 (-)	19	not reliable identification	1.056
D6 (-)	19	not reliable identification	1.139
D7 (-)	20	not reliable identification	1.145
D8 (-)	20	not reliable identification	1.022
D9 (-)	Healthy Urine	not reliable identification	1.241
D10 (-)	Healthy Urine	not reliable identification	1.157
D11 (+)	Spiked Urine	Escherichia coli	1.864
D12 (++)	Spiked Urine	Escherichia coli	2.089

TABLE S2 Results of MALDI analysis of frozen clinical urine samples using 70% formic acid extraction (Run 2)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
E1 (++)	BTSF	Escherichia coli	2.146
E2 (++)	BTSF	Escherichia coli	2.267
E3 (+++)	Solid <i>E. coli</i> F	Escherichia coli	2.345
E4 (+++)	Solid <i>E. coli</i> F	Escherichia coli	2.361
E5 (-)	1F	not reliable identification	1.531
E6 (-)	1F	not reliable identification	1.335
E7 (-)	2F	not reliable identification	1.315
E8 (-)	2F	not reliable identification	1.36
E9 (-)	3F	not reliable identification	1.304
E10 (-)	3F	not reliable identification	1.138
E11 (-)	4F	not reliable identification	1.074
E12 (-)	4F	not reliable identification	1.221
F1 (-)	5F	not reliable identification	1.368
F2 (-)	5F	not reliable identification	1.337
F3 (-)	6F	not reliable identification	1.178
F4 (-)	6F	not reliable identification	1.392
F5 (-)	7F	not reliable identification	1.266
F6 (-)	7F	not reliable identification	1.251
F7 (-)	8F	not reliable identification	1.029
F8 (-)	8F	not reliable identification	1.059
F9 (-)	9F	not reliable identification	1.148
F10 (-)	9F	not reliable identification	1.148
F11 (-)	10F	not reliable identification	1.279
F12 (-)	10F	not reliable identification	1.217
G1 (-)	11F	not reliable identification	1.247
G2 (-)	11F	not reliable identification	1.098
G3 (-)	12F	not reliable identification	1.118

G4 (-)	12F	not reliable identification	1.083
G5 (-)	13F	not reliable identification	1.094
G6 (-)	13F	not reliable identification	1.198
G7 (-)	14F	not reliable identification	1.173
G8 (-)	14F	not reliable identification	1.215
G9 (-)	15F	not reliable identification	1.177
G10 (-)	15F	not reliable identification	1.136
G11 (-)	16F	not reliable identification	1.088
G12 (-)	16F	not reliable identification	1.187
H1 (-)	17F	not reliable identification	1.079
H2 (-)	17F	not reliable identification	1.038
H3 (-)	18F	not reliable identification	1.218
H4 (-)	18F	not reliable identification	1.222
H5 (-)	19F	not reliable identification	1.074
H6 (-)	19F	not reliable identification	1.236
H7 (-)	20F	not reliable identification	1.299
H8 (-)	20F	not reliable identification	1.294
H9 (-)	HUF	not reliable identification	1.355
H10 (-)	HUF	not reliable identification	1.242
H11 (++)	SUF	Escherichia coli	2.197
H12 (++)	SUF	Escherichia coli	2.024

TABLE S3 Results of MALDI analysis of unfrozen clinical urine samples (Run 3)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
A1 (++)	BTS	Escherichia coli	2.148
A2 (+++)	BTS	Escherichia coli	2.407
A3 (+)	Solid <i>E. coli</i>	Escherichia coli	1.94
A4 (++)	Solid <i>E. coli</i>	Escherichia coli	2.258
A5 (-)	Healthy Urine	not reliable identification	1.076
A6 (-)	Healthy Urine	not reliable identification	1.097
A7 (-)	Spiked Urine 10 µL	not reliable identification	1.076
A8 (-)	Spiked Urine 10 µL	not reliable identification	1.144
A9 (-)	Spiked Urine 100 µL	not reliable identification	1.179
A10 (-)	Spiked Urine 100 µL	not reliable identification	1.065
A11 (-)	Spiked Urine 1000 µL	not reliable identification	1.162
A12 (-)	Spiked Urine 1000 µL	not reliable identification	1.39
B1 (-)	1	not reliable identification	1.4
B2 (-)	1	not reliable identification	1.18
B3 (-)	2	not reliable identification	1.255
B4 (-)	2	not reliable identification	1.283
B5 (-)	3	not reliable identification	1.211
B6 (-)	3	not reliable identification	1.292
B7 (-)	4	not reliable identification	0.888
B8 (-)	4	not reliable identification	1.192
B9 (-)	5	not reliable identification	1.184
B10 (-)	5	not reliable identification	1.338
B11 (-)	6	not reliable identification	1.106
B12 (-)	6	not reliable identification	1.151
C1 (-)	7	not reliable identification	1.304
C2 (-)	7	not reliable identification	1.155
C3 (-)	8	not reliable identification	1.352

C4(-)	8	not reliable identification	1.027
C5(-)	9	not reliable identification	0.393
C6(-)	9	not reliable identification	1.023

TABLE S4 Results of MALDI analysis of unfrozen clinical urine samples using 70% formic acid extraction (Run 4)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
D1 (+++)	BTSF	Escherichia coli	2.343
D2 (+++)	BTSF	Escherichia coli	2.305
D3 (+++)	Solid <i>E. coli</i> F	Escherichia coli	2.35
D4 (++)	Solid <i>E. coli</i> F	Escherichia coli	2.187
D5 (-)	Healthy Urine F	not reliable identification	1.218
D6 (-)	Healthy Urine F	not reliable identification	1.262
D7 (-)	Spiked Urine 10 µL F	not reliable identification	1.203
D8 (-)	Spiked Urine 10 µL F	not reliable identification	0.98
D9 (-)	Spiked Urine 100 µL F	not reliable identification	1.068
D10 (-)	Spiked Urine 100 µL F	not reliable identification	1.051
D11 (-)	Spiked Urine 1000 µL F	not reliable identification	1.205
D12 (-)	Spiked Urine 1000 µL F	not reliable identification	1.238
E1 (-)	1F	not reliable identification	1.194
E2 (-)	1F	not reliable identification	1.244
E3 (-)	2F	not reliable identification	1.226
E4 (-)	2F	not reliable identification	1.159
E5 (-)	3F	not reliable identification	1.208
E6 (-)	3F	not reliable identification	1.232
E7 (-)	4F	not reliable identification	1.283
E8 (-)	4F	not reliable identification	0.947
E9 (-)	5F	not reliable identification	1.245
E10 (-)	5F	not reliable identification	1.241
E11 (-)	6F	not reliable identification	1.135
E12 (-)	6F	not reliable identification	1.184
F1 (-)	7F	not reliable identification	1.243
F2 (-)	7F	not reliable identification	1.247
F3 (-)	8F	not reliable identification	1.177

E4(-)	8F	not reliable identification	1.169
E5(-)	9F	not reliable identification	1.122
E6(-)	9F	not reliable identification	1.385

TABLE S5 Results of MALDI analysis of centrifuged unfrozen clinical urine samples (Run 5)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
C7 (-)	Spiked Urine	not reliable identification	1.035
C8 (-)	Spiked Urine	not reliable identification	1.044
C9 (-)	1	not reliable identification	1.134
C10 (-)	1	not reliable identification	1.217
C11 (-)	2	not reliable identification	1.133
C12 (-)	2	not reliable identification	1.159
F7 (-)	3	not reliable identification	1.178
F8 (-)	3	not reliable identification	1.255
F9 (-)	5	not reliable identification	1.261
F10 (-)	5	not reliable identification	1.279
F11 (-)	6	not reliable identification	1.208
F12 (-)	6	not reliable identification	1.113
G1 (-)	7	not reliable identification	1.233
G2 (-)	7	not reliable identification	1.22
G3 (-)	8	not reliable identification	1.071
G4 (-)	8	not reliable identification	1.038
G5 (-)	9	not reliable identification	1.187
G6 (-)	9	not reliable identification	1.081

TABLE S6 Results of MALDI analysis of centrifuged unfrozen clinical urine samples using 70% formic acid extraction (Run 6).

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
G7 (-)	SUF	not reliable identification	1.09
G8 (-)	SUF	not reliable identification	0.964
G9 (-)	1F	not reliable identification	1.094
G10 (-)	1F	not reliable identification	1.116
G11 (-)	2F	not reliable identification	1.194
G12 (-)	2F	not reliable identification	1.184
H1 (-)	3F	not reliable identification	1.345
H2 (-)	3F	not reliable identification	1.245
H3 (++)	5F	Escherichia coli	2.094
H4 (++)	5F	Escherichia coli	2.264
H5 (-)	6F	not reliable identification	0.928
H6 (-)	6F	not reliable identification	1.243
H7 (-)	7F	not reliable identification	1.231
H8 (-)	7F	not reliable identification	1.254
H9 (-)	8F	not reliable identification	1.377
H10 (-)	8F	not reliable identification	1.403
H11 (-)	9F	not reliable identification	1.074
H12 (-)	9F	not reliable identification	0.999

TABLE S7 Results of MALDI analysis of cultured unfrozen clinical urine samples (Run 7).

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
A1 (++)	BTS	Escherichia coli	2.134
A3 (+++)	BTS	Escherichia coli	2.414
A5 (+++)	<i>E. coli</i>	Escherichia coli	2.34
A6 (+++)	<i>E. coli</i>	Escherichia coli	2.343
A9 (+++)	Healthy Urine (100 µL plate)	Escherichia coli	2.31
B3 (+++)	Spiked Urine (10 µL plate)	Escherichia coli	2.346
B4 (++)	Spiked Urine (10 µL plate)	Escherichia coli	2.277
B5 (++)	Spiked Urine (100 µL plate)	Escherichia coli	2.194
B6 (+++)	Spiked Urine (100 µL plate)	Escherichia coli	2.417
B7 (+++)	1 (10 µL plate)	Escherichia coli	2.42
B8 (+++)	1 (100 µL plate)	Escherichia coli	2.328
B9 (+++)	2 (10 µL plate)	Escherichia coli	2.369
B10 (++)	2 (100 µL plate)	Escherichia coli	2.105
B11 (+++)	3 (10 µL plate)	Escherichia coli	2.468
B12 (+++)	3 (100 µL plate)	Escherichia coli	2.369
C1 (+++)	4 (10 µL plate)	Escherichia coli	2.404
C2 (+++)	4 (100 µL plate)	Escherichia coli	2.437
C3 (+++)	5 (10 µL plate)	Escherichia coli	2.345
C4 (++)	5 (100 µL plate)	Escherichia coli	2.284
C5 (++)	6 (10 µL plate)	Escherichia coli	2.292
A4 (++)	6 (10 µL plate)	Escherichia coli	2.284
C6 (-)	6 (100 µL plate)	not reliable identification	1.15
C7 (++)	7 (10 µL plate)	Escherichia coli	2.178
C8 (+++)	7 (100 µL plate)	Escherichia coli	2.37
C9 (++)	8 (10 µL plate)	Escherichia coli	2.171
C10 (++)	8 (100 µL plate)	Escherichia coli	2.17
C11 (+++)	9 (10 µL plate)	Escherichia coli	2.392

C12(+++)	9 (100 µL plate)	Escherichia coli	2.343
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TABLE S8 Results of MALDI analysis of cultured unfrozen clinical urine samples using 70% formic acid extraction (Run 8)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
A7 (+++)	<i>E. coli</i> F	Escherichia coli	2,447
A8 (+++)	<i>E. coli</i> F	Escherichia coli	2,422
A10 (++)	Healthy Urine (100 µL plate) F	Escherichia coli	2,292
D3 (+++)	Spiked Urine (10 µL plate) F	Escherichia coli	2,398
D4 (+++)	Spiked Urine (10 µL plate) F	Escherichia coli	2,344
D5 (++)	Spiked Urine (100 µL plate) F	Escherichia coli	2,239
D6 (+++)	Spiked Urine (100 µL plate) F	Escherichia coli	2,35
D7 (+++)	1 (10 µL plate) F	Escherichia coli	2,447
D8 (+++)	1 (100 µL plate) F	Escherichia coli	2,449
D9 (+++)	2 (10 µL plate) F	Escherichia coli	2,437
D10 (+++)	2 (100 µL plate) F	Escherichia coli	2,433
D11 (+++)	3 (10 µL plate) F	Escherichia coli	2,381
D12 (+++)	3 (100 µL plate) F	Escherichia coli	2,46
E1 (+++)	4 (10 µL plate) F	Escherichia coli	2,452
E2 (+++)	4 (100 µL plate) F	Escherichia coli	2,429
E3 (+++)	5 (10 µL plate) F	Escherichia coli	2,544
E4 (++)	5 (100 µL plate) F	Escherichia coli	2,218
E5 (-)	6 (10 µL plate) F	not reliable identification	1,567
E6 (+)	6 (100 µL plate) F	Escherichia coli	1,787
E7 (+++)	7 (10 µL plate) F	Escherichia coli	2,392
E8 (+)	7 (100 µL plate) F	Escherichia coli	1,946
E9 (++)	8 (10 µL plate) F	Escherichia coli	2,089
E10 (++)	8 (100 µL plate) F	Escherichia coli	2,149
E11 (+++)	9 (10 µL plate) F	Escherichia coli	2,344
E12 (++)	9 (100 µL plate) F	Escherichia coli	2,252

TABLE S9 Results of MALDI analysis of unfrozen clinical urine samples (Run 9).

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
BTS(-)	BTS	not reliable identification	1.584
BTS(+++)	BTS	Escherichia coli	2.332
EC(+++)	EC	Escherichia coli	2.309
EC(+++)	EC	Escherichia coli	2.425
HU(-)	HU	not reliable identification	1.318
HU(-)	HU	not reliable identification	1.512
1(-)	1	not reliable identification	1.066
1(-)	1	not reliable identification	1.01
2(-)	2	not reliable identification	1.121
2(-)	2	not reliable identification	1.209
3(-)	3	not reliable identification	1.116
3(-)	3	not reliable identification	1.195
4(-)	4	not reliable identification	1.099
4(-)	4	not reliable identification	1.041
5(-)	5	not reliable identification	1.168
5(-)	5	not reliable identification	1.08
6(-)	6	not reliable identification	1.377
6(-)	6	not reliable identification	1.224
7(-)	7	not reliable identification	1.218
7(-)	7	not reliable identification	1.309
8(-)	8	not reliable identification	1.032
8(-)	8	not reliable identification	1.206
9(-)	9	not reliable identification	1.245
9(-)	9	not reliable identification	1.242
10(-)	10	not reliable identification	1.19
10(-)	10	not reliable identification	1.162

TABLE SI0 Results of MALDI analysis of unfrozen clinical urine samples using 70% formic acid extraction (Run 10)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
BTSE(-)	BTSE	not reliable identification	1.169
BTSE(-)	BTSE	not reliable identification	0.983
ECF(++)	ECF	Escherichia coli	2.272
ECF(+++)	ECF	Escherichia coli	2.301
HUF(-)	HUF	not reliable identification	1.287
HUF(-)	HUF	not reliable identification	1.469
1F(-)	1F	not reliable identification	1.156
1F(-)	1F	not reliable identification	1.034
2F(-)	2F	not reliable identification	1.161
2F(-)	2F	not reliable identification	1.272
3F(-)	3F	not reliable identification	1.129
3F(-)	3F	not reliable identification	1.05
4F(-)	4F	not reliable identification	1.024
4F(-)	4F	not reliable identification	0.963
5F(-)	5F	not reliable identification	1.005
5F(-)	5F	not reliable identification	1.202
6F(-)	6F	not reliable identification	1.316
6F(-)	6F	not reliable identification	1.365
7F(-)	7F	not reliable identification	1.289
7F(-)	7F	not reliable identification	1.328
8F(-)	8F	not reliable identification	1.352
8F(-)	8F	not reliable identification	1.166
9F(-)	9F	not reliable identification	1.15
9F(-)	9F	not reliable identification	1.159
10F(-)	10F	not reliable identification	1.156
10F(-)	10F	not reliable identification	1.168
11F(-)	11F	not reliable identification	1.253

11F(-)	11F	not reliable identification	1036
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TABLE S11 Results of MALDI analysis of centrifuged unfrozen clinical urine samples (Run 11)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
1C (-)	1C	not reliable identification	1.092
1C (-)	1C	not reliable identification	1.045
2C (-)	2C	not reliable identification	1.005
2C (-)	2C	not reliable identification	1.031
3C (-)	3C	not reliable identification	1.129
3C (-)	3C	not reliable identification	1.049
4C (-)	4C	not reliable identification	1.184
4C (-)	4C	not reliable identification	1.055
5C (-)	5C	not reliable identification	1.056
5C (-)	5C	not reliable identification	1.16
6C (-)	6C	not reliable identification	1.629
6C (-)	6C	not reliable identification	1.258
7C (-)	7C	not reliable identification	1.231
7C (-)	7C	not reliable identification	1.358
8C (-)	8C	not reliable identification	1.088
8C (-)	8C	not reliable identification	1.17
9C (-)	9C	not reliable identification	1.176
9C (-)	9C	not reliable identification	0.99
10C (-)	10C	not reliable identification	1.134
11C (-)	11C	not reliable identification	1.139

TABLE S12 Results of MALDI analysis of centrifuged unfrozen clinical urine samples using 70% formic acid extraction (Run 12)

AnalyteName	AnalyteID	Organism(best match)	ScoreValue
1CF(-)	1CF	not reliable identification	1.117
1CF(-)	1CF	not reliable identification	1.16
2CF(-)	2CF	not reliable identification	1.122
2CF(-)	2CF	not reliable identification	1.013
3CF(-)	3CF	not reliable identification	1.025
3CF(-)	3CF	not reliable identification	1.23
4CF(-)	4CF	not reliable identification	1.115
4CF(-)	4CF	not reliable identification	1.058
5CF(-)	5CF	not reliable identification	1.421
5CF(-)	5CF	not reliable identification	1.284
6CF(-)	6CF	not reliable identification	1.648
6CF(+)	6CF	Escherichia coli	1.819
7CF(-)	7CF	not reliable identification	1.362
7CF(-)	7CF	not reliable identification	1.271
8CF(-)	8CF	not reliable identification	1.011
8CF(-)	8CF	not reliable identification	1.092
9CF(-)	9CF	not reliable identification	1.218
9CF(-)	9CF	not reliable identification	1.143
10CF(-)	10CF	not reliable identification	1.128
10CF(-)	10CF	not reliable identification	1.228
11CF(-)	11CF	not reliable identification	1.141
11CF(-)	11CF	not reliable identification	1.239

TABLE S13 April 27th urine sample appearances

Sample #	Description
1	Pale yellow, slightly cloudy, small amount of suspended material
2	Pale pink, moderately cloudy, small amount of suspended material
3	Vivid yellow, slightly cloudy
4	Vivid yellow, clear
5	Clear, colourless
6	Medium yellow, slightly cloudy
7	Vivid pink, clear, some suspended material
8	Medium yellow, slightly cloudy
9	Medium orange, opaque

TABLE SI4 June 7th urine sample appearances

Sample #	Urine Sample Description	Pellet Description
1	Cloudy, pale orangish yellow	Large, pinkish
2	Slightly cloudy, pale yellow	Medium size, orangish
3	Cloudy, pale yellow	Medium size, orangish
4	Slightly cloudy, medium yellow	Large, yellowish
5	Slightly cloudy, pale yellow	Small, pale coloured
6	Clear, nearly colourless with a slight pinkish hue. Some suspended material	Very small, pale coloured
7	Clear, colourless	Very small, pale coloured
8	Slightly cloudy, pale yellow	Medium sized, orangish
9	Almost clear, pale yellow	Small, pale yellow
10	Almost clear, medium yellow	Medium sized, yellowish
11	Clear, medium yellow	Small, pale yellow