

Supplementary Information: Analytical Methods

Methodologies for bladder cancer detection with Raman based urine cytology

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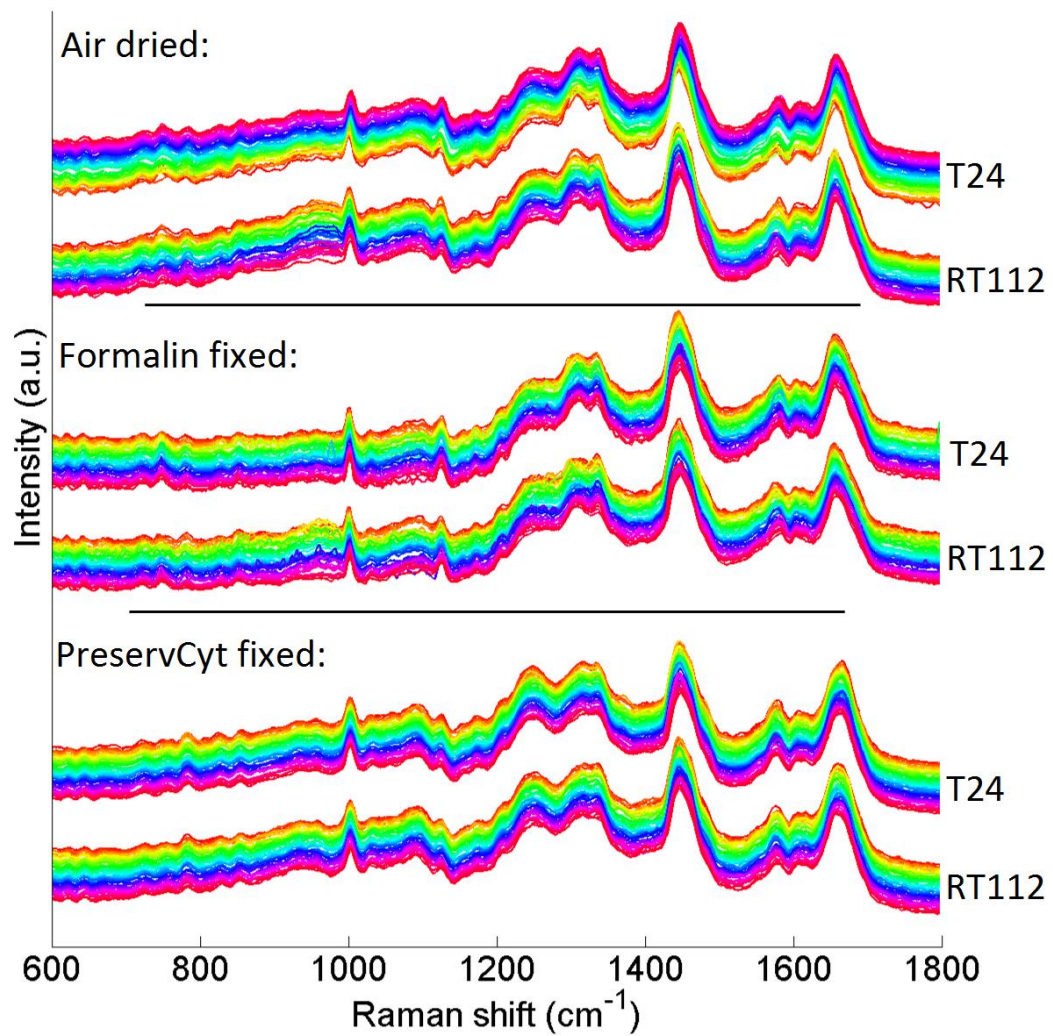
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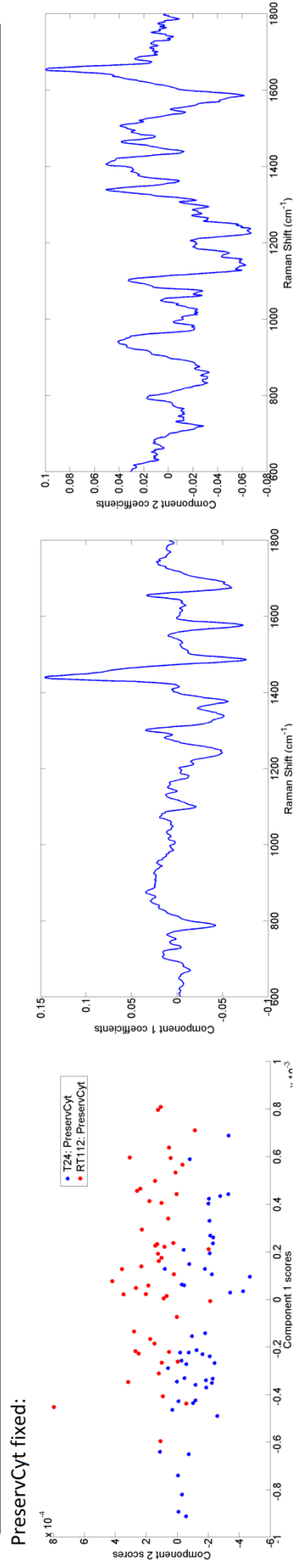
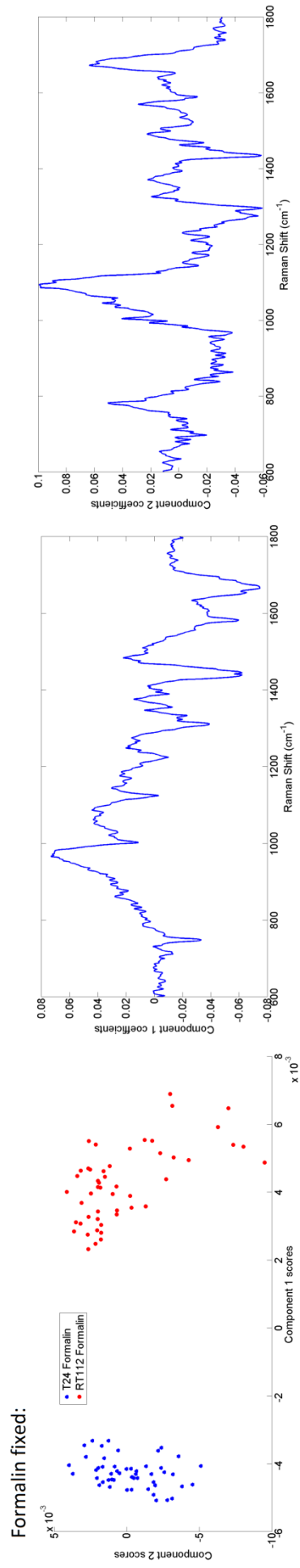
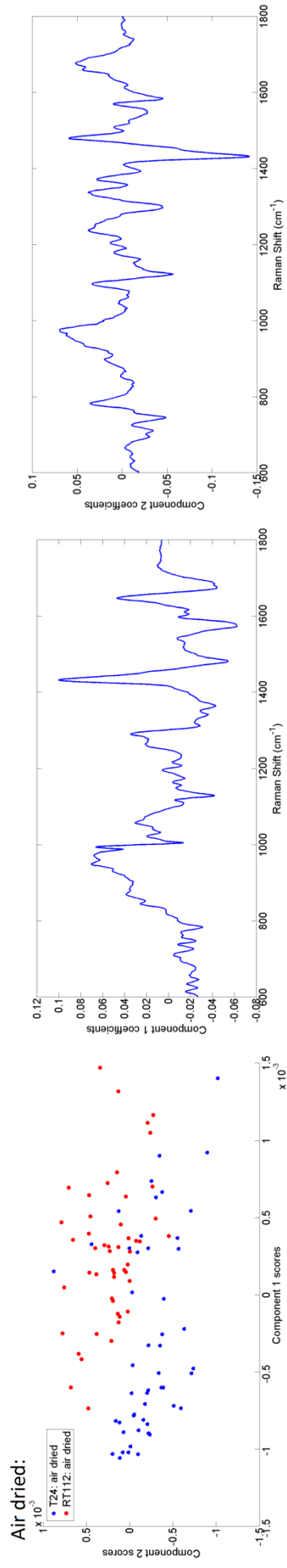
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Supplementary Figure 1:



Description:

50 spectra (offset) from each of the following datasets: (i) air dried T24 and RT112 cells; (ii) formalin fixed T24 and RT112; and (iii) PreservCyt fixed T24 and RT112, which were compared in terms of fixing agents in Section 4.2. Spectra have been baseline corrected using the EMSC algorithm, as described in Section 2.3.

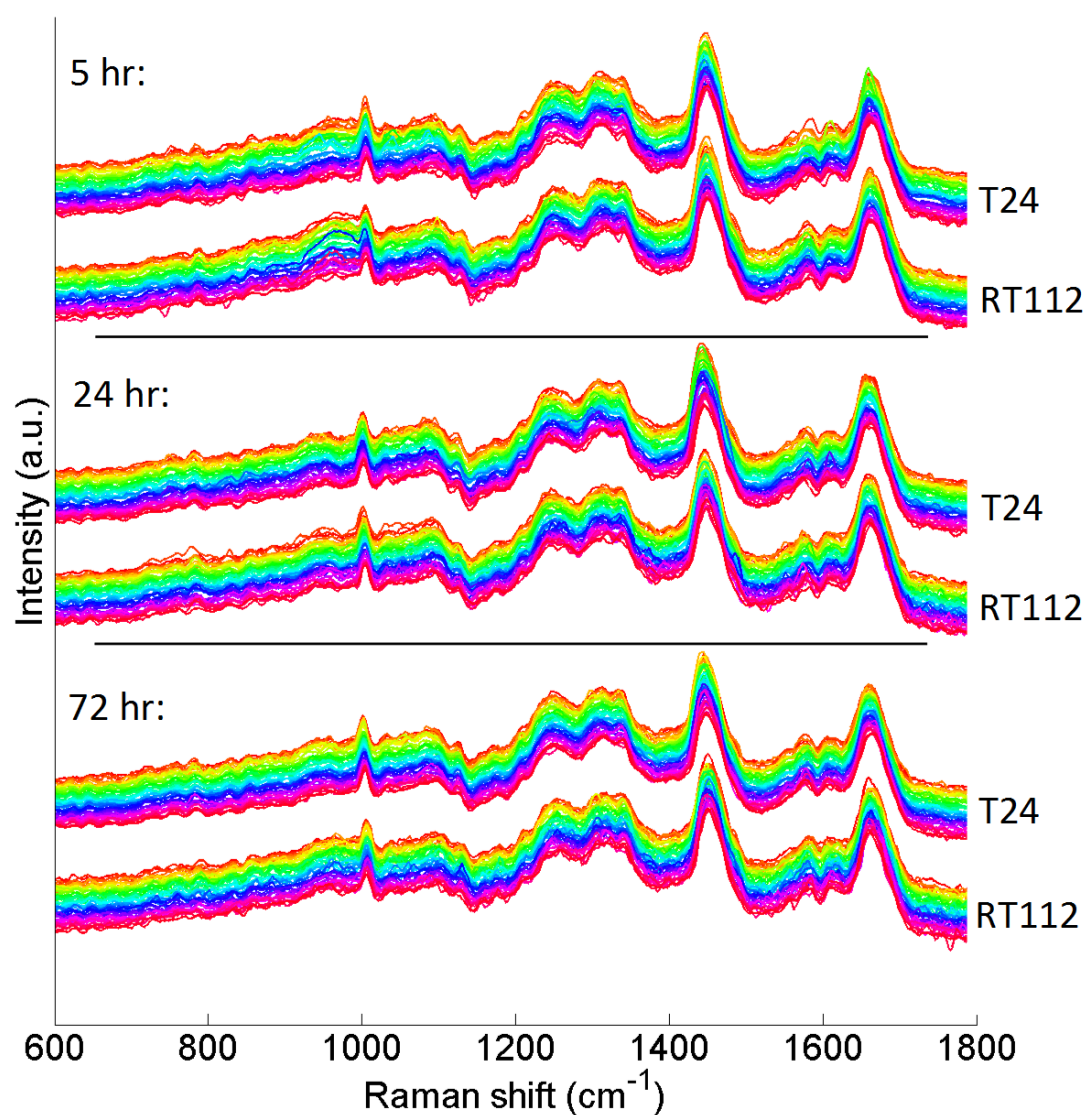


Supplementary Figure 2:

Description:

PCA scores and the first two PC loadings shown for (i) air dried T24 vs RT112 cells; (ii) formalin fixed T24 vs RT112 cells; and (iii) PreservCyt fixed T24 and RT112 cells. Similar features are seen within the PC loadings across different fixing agents; this is particularly evident within PC1 for air-drying and PC1 for PreservCyt fixation.

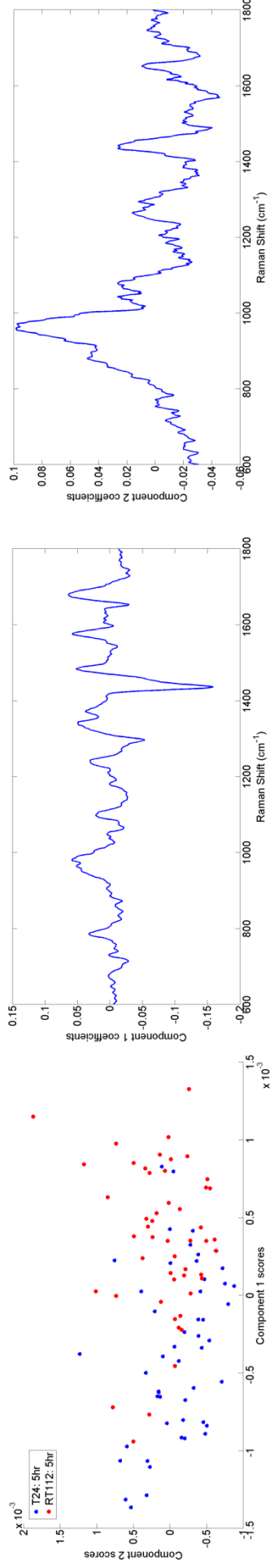
Supplementary Figure 3:



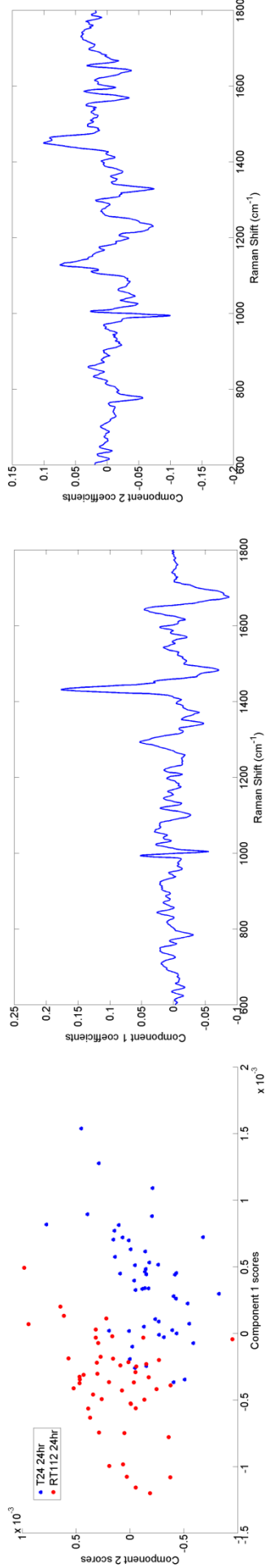
Description:

50 T24 and RT112 spectra (offset) for each of the following time durations of urine exposure: (i) 5 hours; (ii) 24 hours; and (iii) 72 hours; these spectra were compared in terms of urine exposure times in Section 4.3. Spectra have been baseline corrected using the EMSC algorithm, as described in Section 2.3.

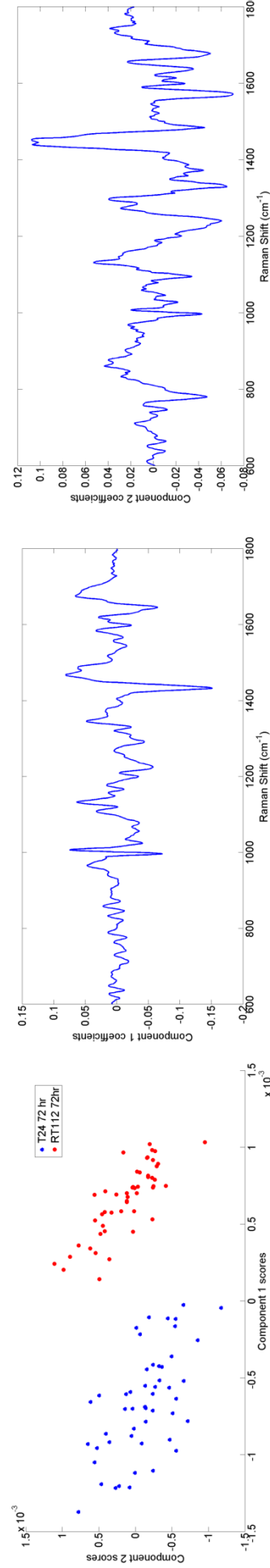
5 hour:



24 hour:



72 hour:

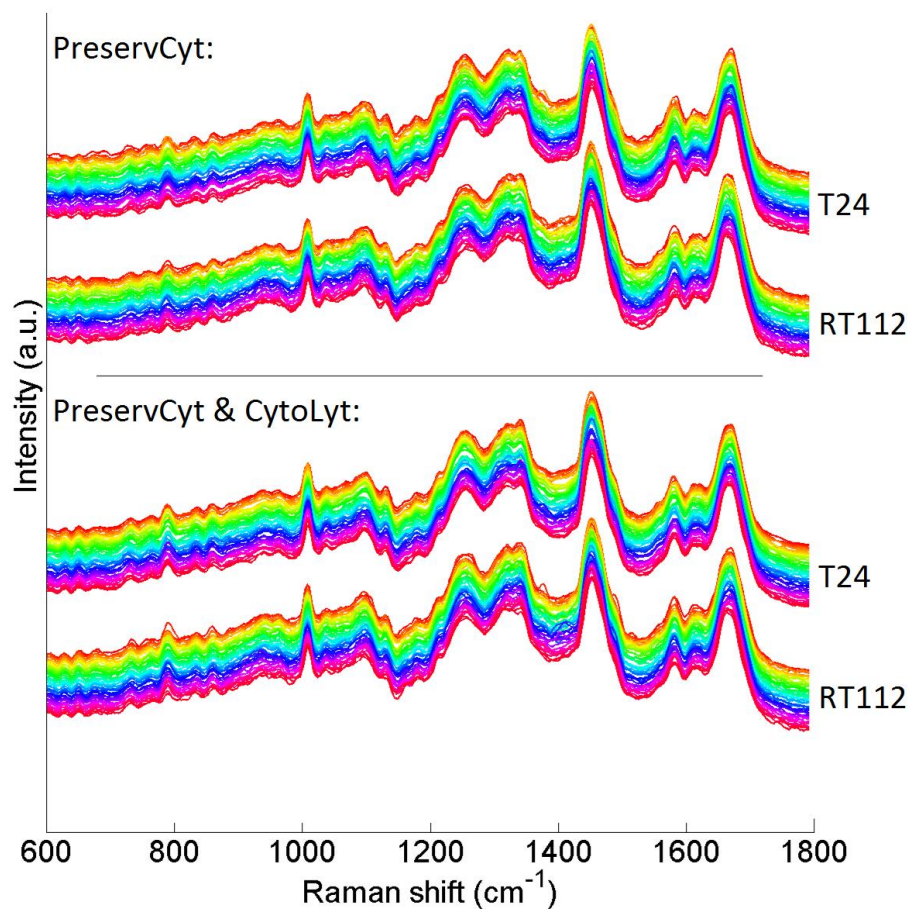


Supplementary Figure 4:

Description:

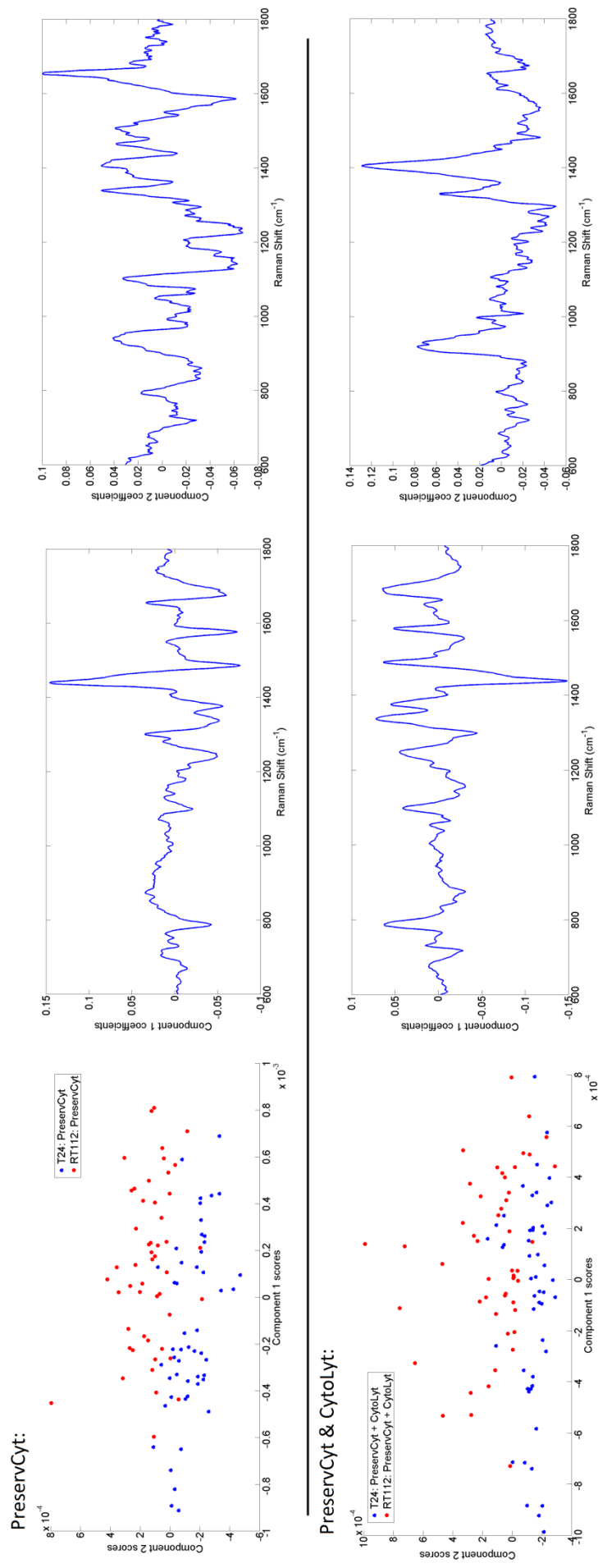
PCA scores and the first two PC loadings shown for T24 and RT112 cells exposed to urine for the following time durations: (i) 5 hours; (ii) 24 hours; and (iii) 72 hours. PC1 shows similar features for all three time durations, with most similar representations found for 24 and 72 hour exposures. PC2 also identifies similar features, particularly within the higher wavenumber region ($1200\text{--}1800\text{ cm}^{-1}$).

Supplementary Figure 5:



Description:

T24 and RT112 cell spectra (offset) recorded following cell deposition using the ThinPrep UroCyte method, with (i) only PreservCyt, or (ii) with PreservCyt and CytoLyt, which were compared in Section 4.4. Spectra have been baseline corrected using the EMSC algorithm, as described in Section 2.3.



Supplementary Figure 6:

Description:

PCA scores and the first two PC loadings shown for T24 and RT112 cells following cell deposition using the ThinPrep UroCyt method, using (i) PreservCyt only; or (ii) PreservCyt and Cytolyt. PC1 is comparable for both groups; however PC2 shows distinguishing features which may be related to the addition of the Cytolyt solution. Nonetheless, good separation can be seen within the PCA scores for T24 and RT112 for both groups.