

APPLICATION NOTE

CELL CULTURE MEDIA IDENTIFICATION WITH HANDHELD 1064NM RAMAN FOR

- IMPROVED QUALITY CONTROL
- INCREASED PRODUCTION EFFICIENCY



CELL CULTURE MEDIA IDENTIFICATION USING RAMAN ANALYSIS

The cell culture media used for the growth of cells play an important role in the quality and efficiency of biopharmaceutical production. Raman spectroscopy is a non-destructive, reliable, efficient and cost effective method to analyze complex cell culture media. It can provide highly detailed chemical information about a variety of samples, and requires little to no sample preparation. The USP and EP now recognize Raman spectroscopy as a viable technique for compendial identification.

THE PROGENY 1064NM HANDHELD RAMAN IS IDEAL FOR CELL CULTURE MEDIA IDENTIFICATION. IT IS

- RELIABLE
- NON-DESTRUCTIVE
- RAPID: ONLY 1 SECOND PER MEASUREMENT

THE FLUORESCENCE PROBLEM SOLVED

Fluorescence from cell culture media is a common problem associated with handheld Raman analyzers using 785 nm laser excitation sources. With Rigaku Progeny™ 1064nm the fluorescence problem can be overcome. Four synthetic cell culture media were analyzed with Rigaku Raman 1064nm and 785nm spectrometers (Figures 1 – 4). The 785 nm spectra show significant fluorescence, making it difficult to obtain reliable and specific information about the sample. In contrast, the 1064 nm spectra show clear Raman peaks that can be used to reliably distinguish different media. Figure 5 shows the Raman spectra from two cell culture media, both of which are versions of a minimum essential medium developed by Harry Eagle, that have only small differences in their components. Clear differences can be seen in these Raman spectra and when a correlation analysis was performed these media could be accurately and reliably distinguished.

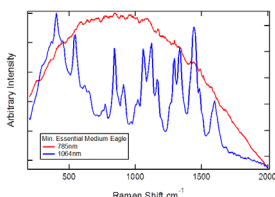


Figure 1. Comparison of 785 nm and 1064 nm excitation Raman spectra of cell culture medium; Minimum Essential Medium developed by Harry Eagle.

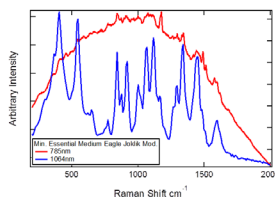


Figure 2. Comparison of 785 nm and 1064 nm excitation Raman spectra of cell culture medium; Minimum Essential Medium Eagle Joklik Modification.

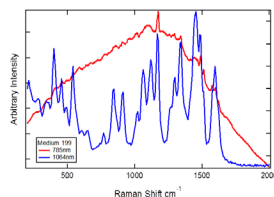


Figure 3. Comparison of 785 nm and 1064 nm excitation Raman spectra of cell culture medium; Medium 199.

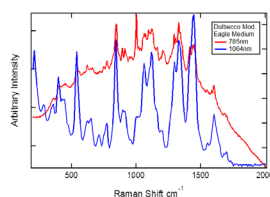


Figure 4. Comparison of 785 nm and 1064 nm excitation Raman spectra of cell culture medium; Dulbecco Modified Eagle Medium.

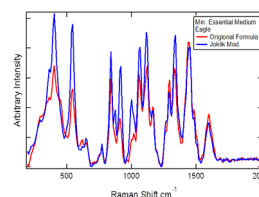


Figure 5. 1064 nm laser excitation Raman spectra of two slightly different modifications of Minimum Essential Medium Eagle.