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(54) Title: LABEL-FREE DETECTION OF MYCOBACTERIA USING SURFACE ENHANCED RAMAN SPECTROSCOPY

(57) Abstract: A method of identifying a mycobacterium using surface enhanced Raman spectroscopy (SERS), disclosed herein, comprises disposing a sample suspected to comprise a mycobacterium on a SERS-active substrate, detecting surface enhanced Raman signals corresponding to an alpha-mycolic acid, a methoxy-mycolic acid, and a keto-mycolic acid from the sample disposed on the SERS-active substrate, and determining one or more ratios of intensity of the surface enhanced Raman signals to identify the mycobacterium. Disclosed herein also includes a method of detecting a mycobacterial disease using surface enhanced Raman spectroscopy (SERS), the method comprising identifying a mycobacterium according to the method described above, and determining the mycobacterial disease based on the mycobacterium identified.