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Clinical Image

A Comparative Computational and Experimental Study on Different Vibrational Biospectroscopy Methods, Techniques and Applications for Human Cancer Cells in Tumor Tissues Simulation, Modeling, Research, Diagnosis and Treatment

Image Article

In the current image article, we present different computational and experimental vibrational biospectroscopy methods and techniques such as Fourier Transform–Near–Infrared (FT–NIR), Fourier Transform–Short–Wavelength Infrared (FT–SIR), Fourier Transform–Mid–Wavelength Infrared (FT–MIR), Fourier Transform–Long–Wavelength Infrared (FT–LIR), Fourier Transform–Far–Infrared (FT–FIR), Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR) and Fourier Transform–Raman (FT–Raman) spectroscopies for human cancer cells in tumor tissues simulation, modeling, research, diagnosis and treatment (Figure 1) [1–90].

Furthermore, we have computationally simulated human cancer cells in tumor tissues using different vibrational biospectroscopy methods and techniques such as Fourier Transform–Near–Infrared (FT–NIR), Fourier Transform–Short–Wavelength Infrared (FT–SIR), Fourier Transform–Mid–Wavelength Infrared (FT–MIR), Fourier Transform–Long–Wavelength Infrared (FT–LIR), Fourier Transform–

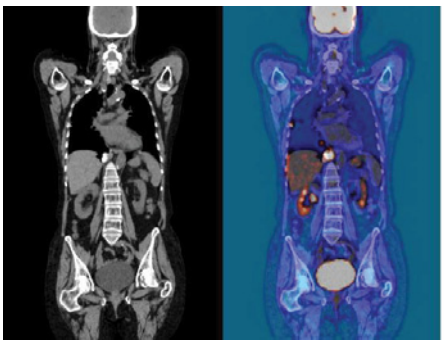

Figure 1a: Different vibrational biospectroscopy methods and techniques such as (a) Fourier Transform–Near–Infrared (FT–NIR).

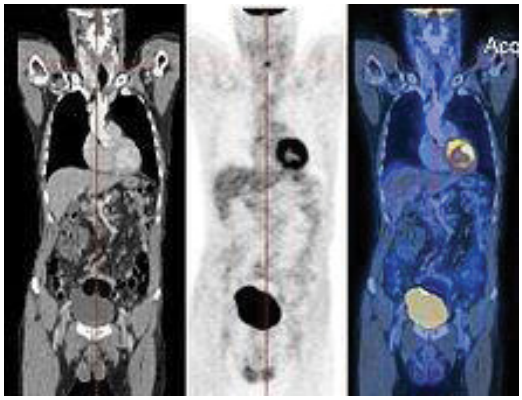

Figure 1b: Fourier Transform–Short–Wavelength Infrared (FT–SIR).

Figure 1c: Fourier Transform–Mid–Wavelength Infrared (FT–MIR).

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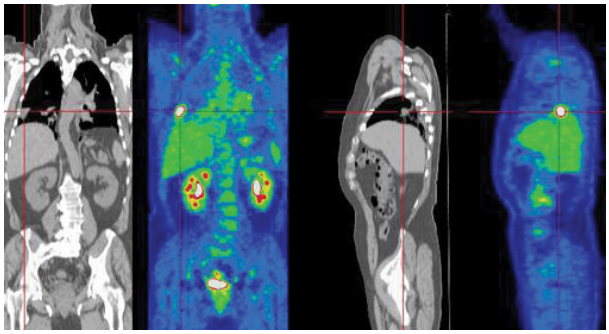

Figure 1d: Fourier Transform. Long–Wavelength Infrared (FT–LIR).

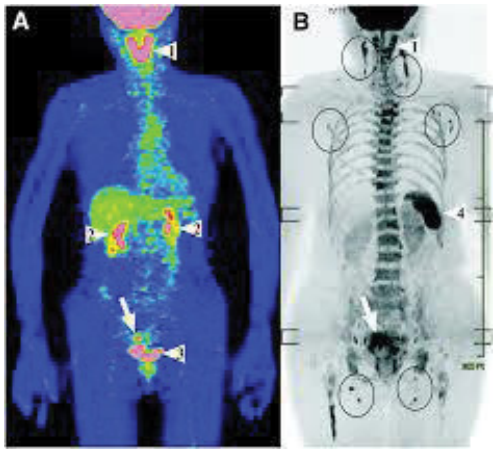

Figure 1e: Fourier Transform–Far–Infrared (FT–FIR).

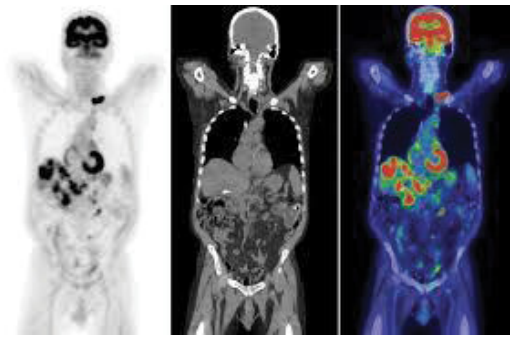

Figure 1f: Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR).

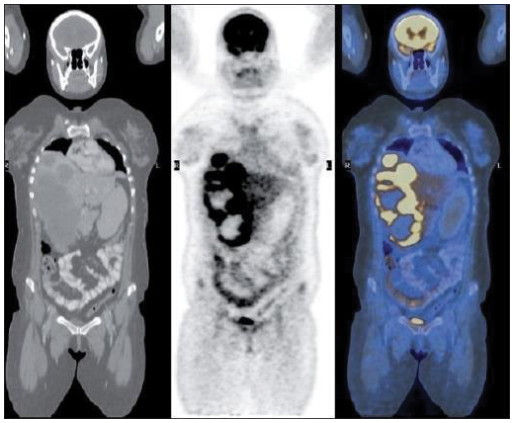

Figure 1g: Fourier Transform–Raman (FT–Raman) spectroscopies for human cancer cells in tumor tissues simulation, modeling, research, diagnosis and treatment [1–90].

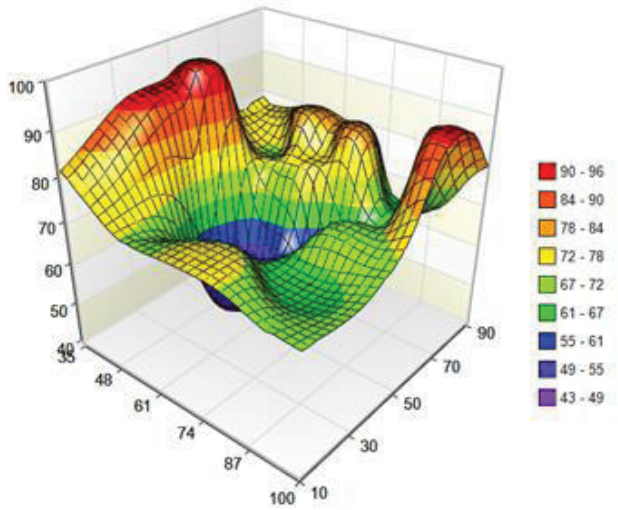

Figure 2: Computational simulations of human cancer cells in tumor tissues using different vibrational biospectroscopy methods and techniques such as Fourier Transform–Near–Infrared (FT–NIR) [90–96], Fourier Transform–Short–Wavelength Infrared (FT–SIR) [84–90], Fourier Transform–Mid–Wavelength Infrared (FT–MIR) [78–84], Fourier Transform–Long–Wavelength Infrared (FT–LIR) [72–78], Fourier Transform–Far–Infrared (FT–FIR) [61–72], Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR) [49–61] and Fourier Transform–Raman (FT–Raman) spectroscopies [43–49],[1–90].

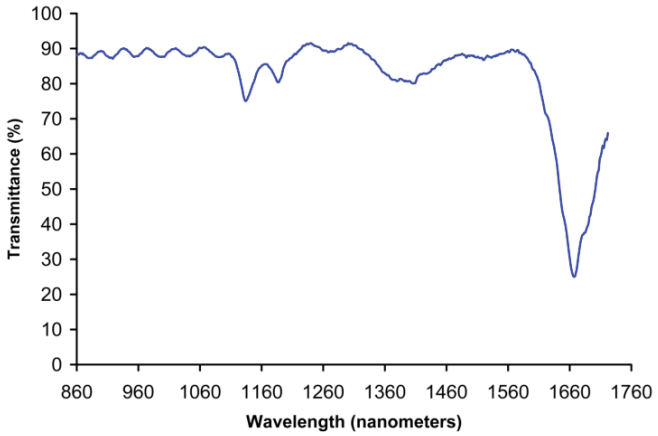

Figure 3a: Experimental vibrational spectra of human cancer cells in tumor tissues using different vibrational biospectroscopy methods and techniques such as (a) Fourier Transform–Near–Infrared (FT–NIR).

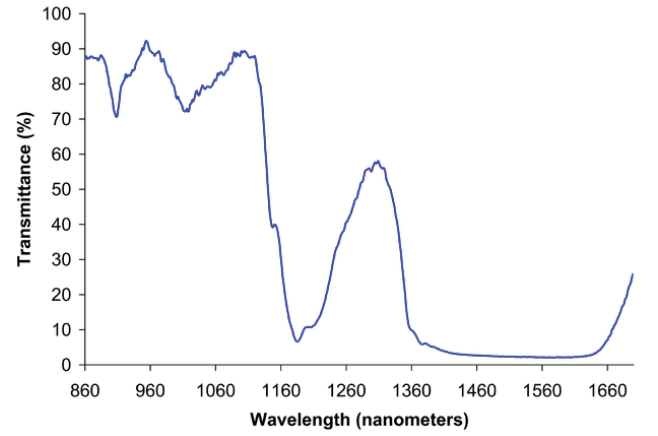

Figure 3b: Fourier Transform–Short–Wavelength Infrared (FT–SIR).

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Far–Infrared (FT–FIR), Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR) and Fourier Transform–Raman (FT–Raman) spectroscopies (Figure 2) [1–90].

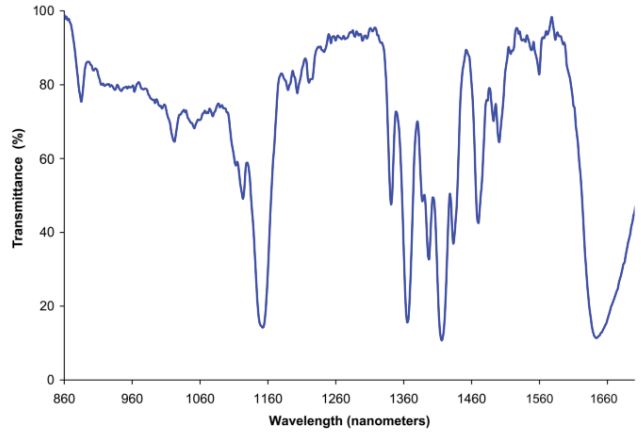

Figure 3c: Fourier Transform–Mid–Wavelength Infrared (FT–MIR).

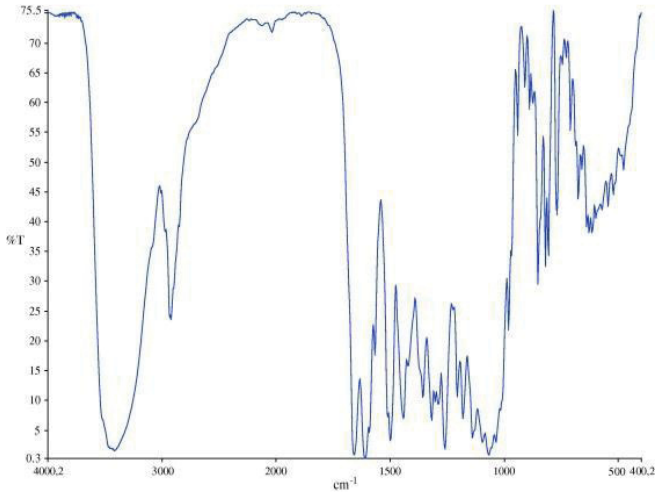

Figure 3d: Fourier Transform–Long–Wavelength Infrared (FT–LIR).

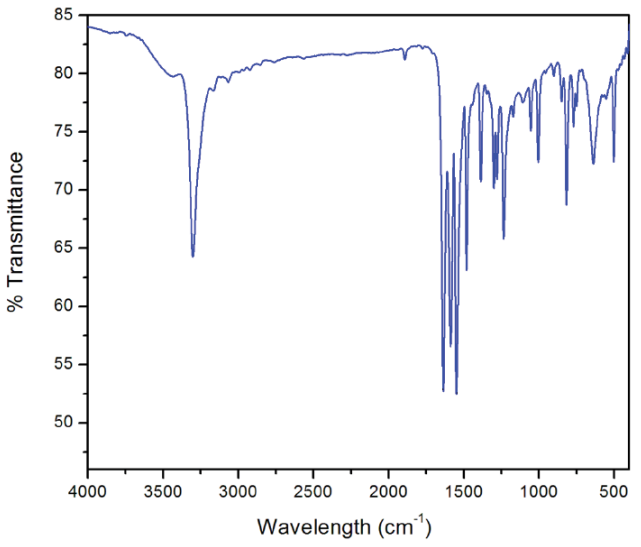

Figure 3e: Fourier Transform–Far–Infrared (FT–FIR).

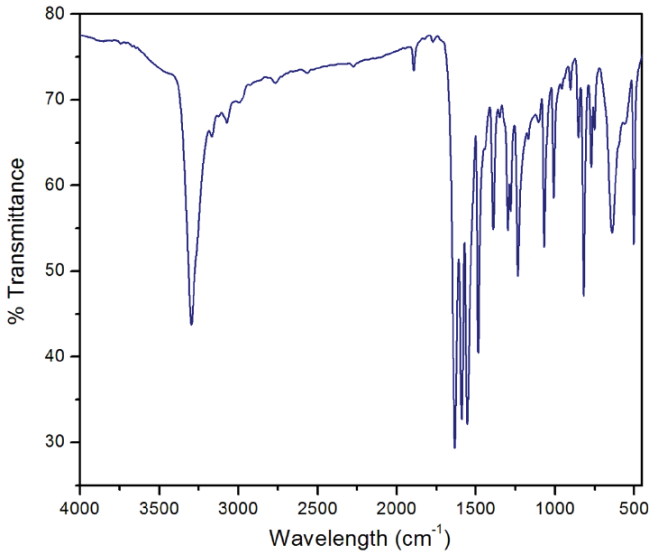

Figure 3f: Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR).

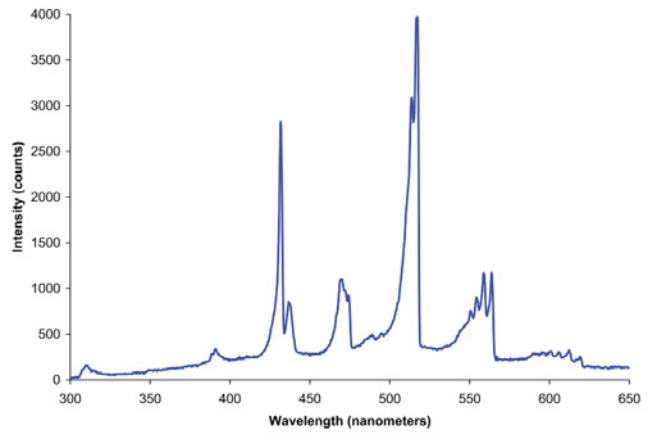

Figure 3g: Fourier Transform–Raman (FT–Raman) spectroscopies [1–90].

In addition, we have experimentally presented human cancer cells in tumor tissues related vibrational spectra using different vibrational biospectroscopy methods and techniques such as Fourier Transform–Near–Infrared (FT–NIR), Fourier Transform–Short–Wavelength Infrared (FT–SIR), Fourier Transform–Mid–Wavelength Infrared (FT–MIR), Fourier Transform–Long–Wavelength Infrared (FT–LIR), Fourier Transform–Far–Infrared (FT–FIR), Attenuated Total Reflectance–Fourier Transform Infrared (ATR–FTIR) and Fourier Transform–Raman (FT–Raman) spectroscopies (Figure 3) [1–90].

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