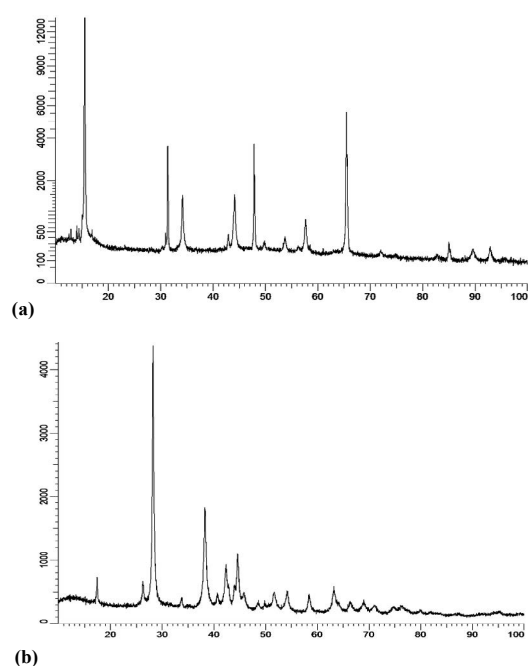


# Human malignant and benign human cancer cells and tissues biospectroscopic analysis under synchrotron radiation using anti-cancer nano drugs delivery

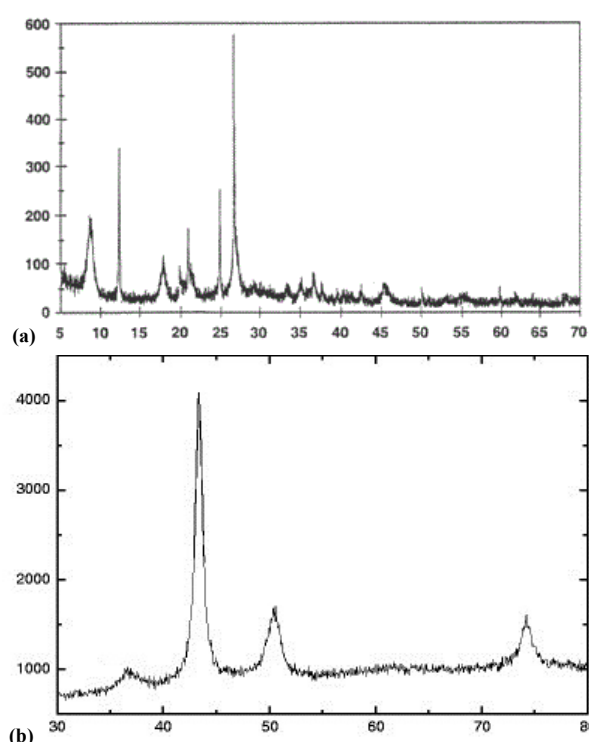
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In the current study, we have experimentally and comparatively investigated and compared malignant human cancer cells and tissues before and after irradiating of synchrotron radiation using Small-Angle X-Ray Scattering (SAXS), Ultra-Small Angle X-Ray Scattering (USAXS), Fluctuation X-Ray Scattering (FXS), Wide-Angle X-Ray Scattering (WAXS), Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS), Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS), Small-Angle Neutron Scattering (SANS), Grazing-Incidence Small-Angle Neutron Scattering (GISANS), X-Ray Diffraction (XRD), Powder X-Ray Diffraction (PXRD), Wide-Angle X-Ray Diffraction (WAXD), Grazing-Incidence X-Ray Diffraction (GIXD) and Energy-Dispersive X-Ray Diffraction (EDXRD). It is clear that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues under synchrotron radiation with the passage of time (Figures 1-13) [1-198]. It is clear that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues under synchrotron radiation with the passage of time (Figures 1-13) [1-198]. It should be noted that malignant human cancer cells and tissues were exposed under white synchrotron radiation for 30



**Figure 1.** Small-Angle X-Ray Scattering (SAXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



**Figure 2.** Ultra-Small Angle X-Ray Scattering (USAXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]

days. Furthermore, there is a shift of the spectrum in all of spectra after irradiating of synchrotron radiation that it is because of the malignant human cancer cells and tissues shrink post white synchrotron radiation with the passage of time. In addition, all of the figures are related to the same human cancer cells and tissues. Moreover, in all of the figures y-axis shows intensity and also x-axis shows energy (keV).

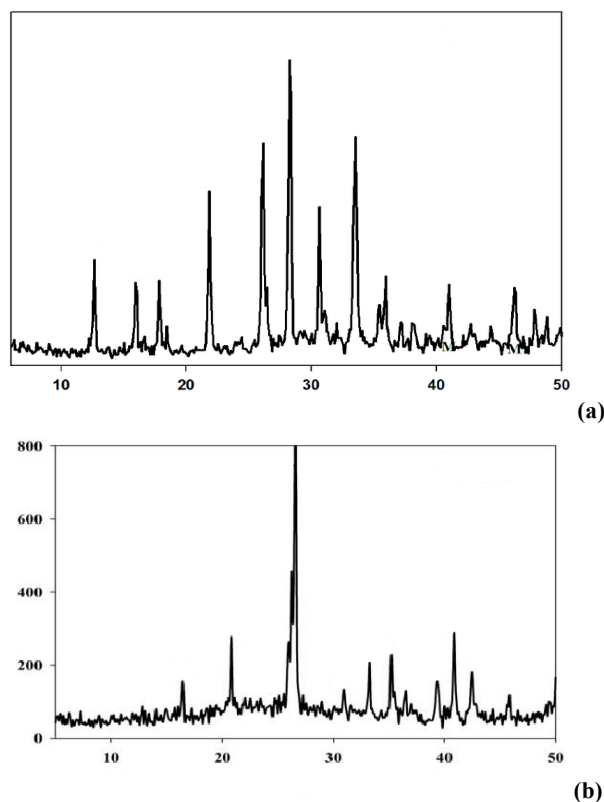
It can be concluded that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues

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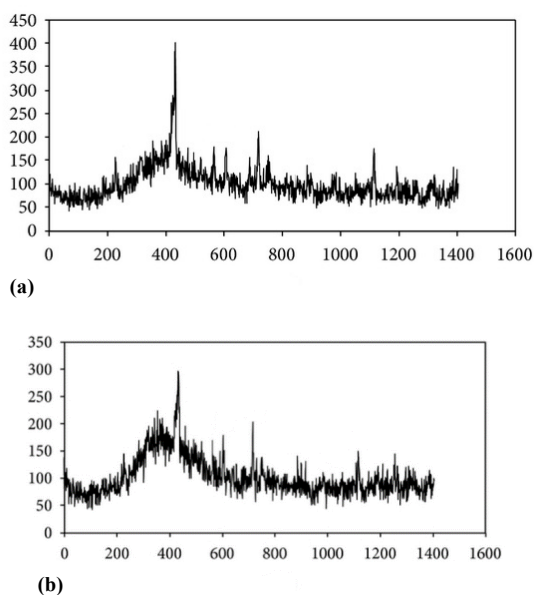
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under synchrotron radiation with the passage of time (Figures 1-13) [1-198]. It should be noted that malignant human cancer cells and tissues were exposed under white synchrotron radiation for 30 days. Furthermore, there is a shift of the spectrum in all of spectra after irradiating of synchrotron radiation that it is because of the malignant

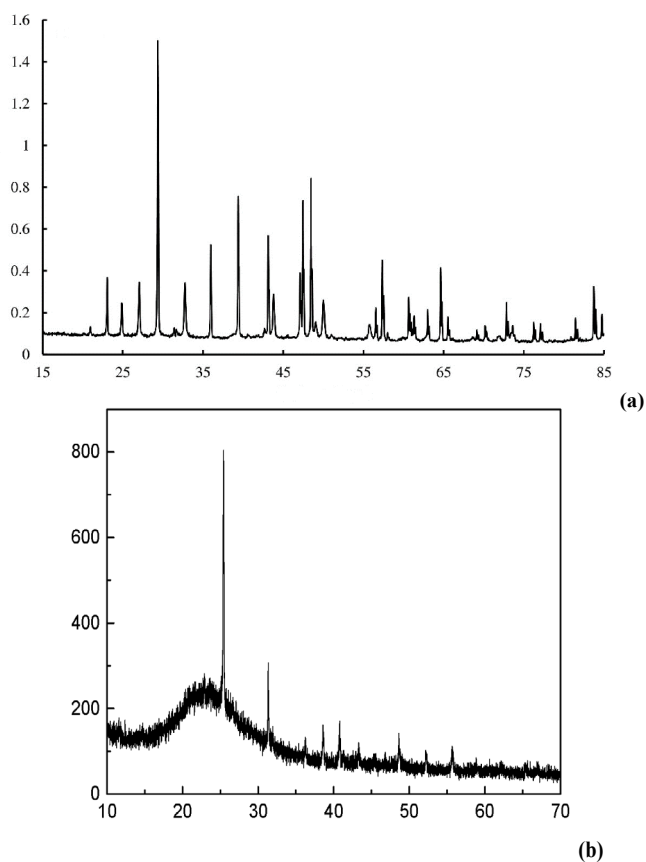
human cancer cells and tissues shrink post white synchrotron irradiation with the passage of time. In addition, all of the figures are related to the same human cancer cells and tissues. Moreover, in all of the figures y-axis shows intensity and also x-axis shows energy (keV).



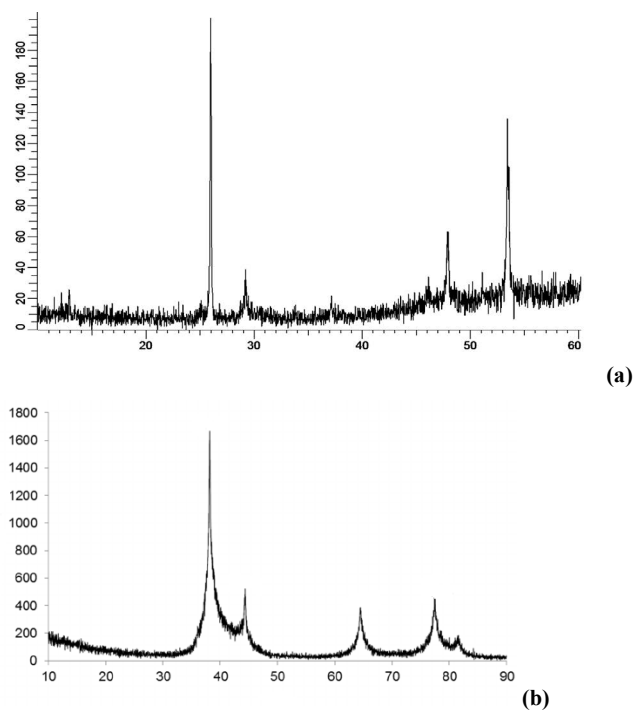
**Figure 3.** Fluctuation X-Ray Scattering (FXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



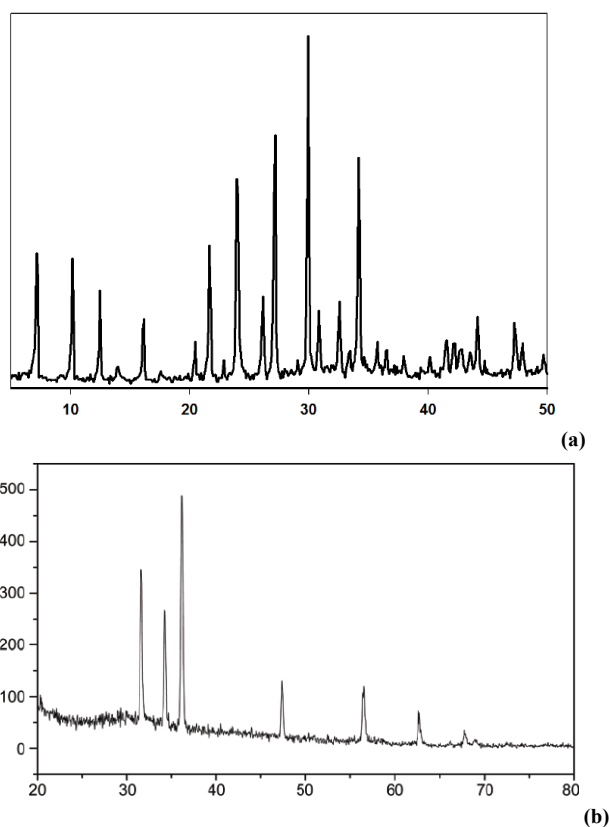
**Figure 4.** Wide-Angle X-Ray Scattering (WAXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



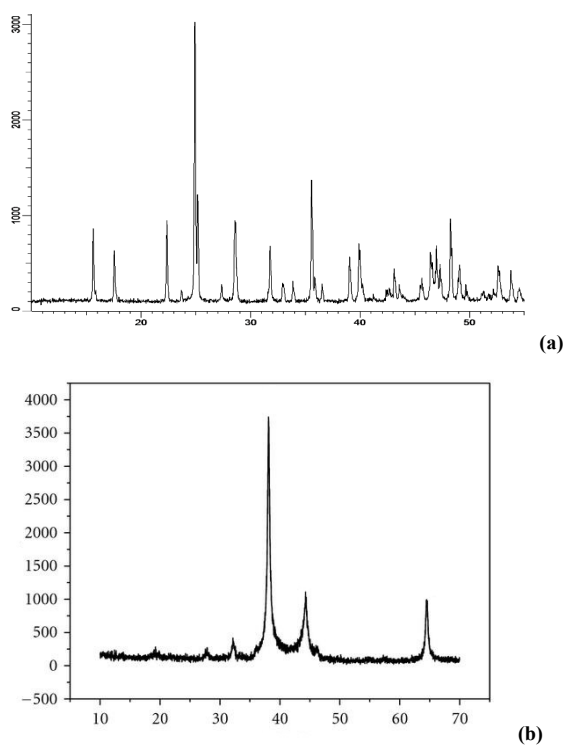
**Figure 5.** Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



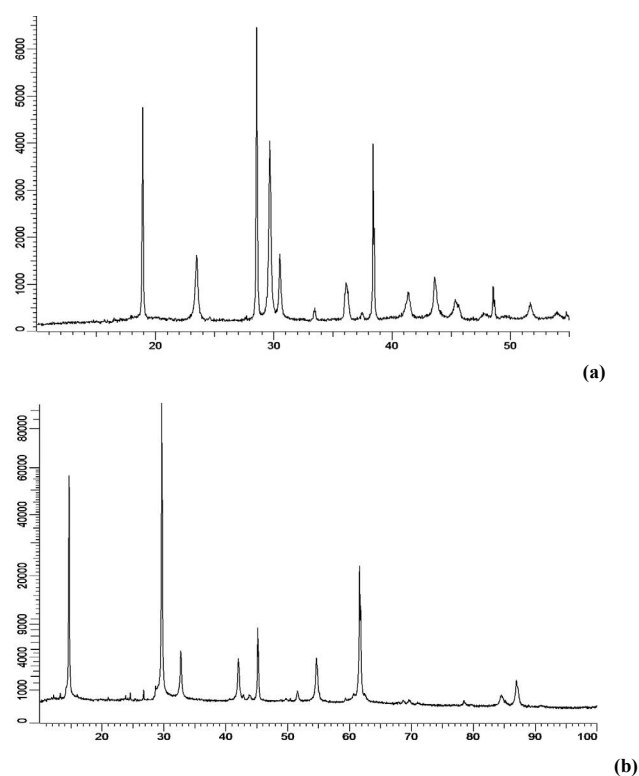
**Figure 6.** Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



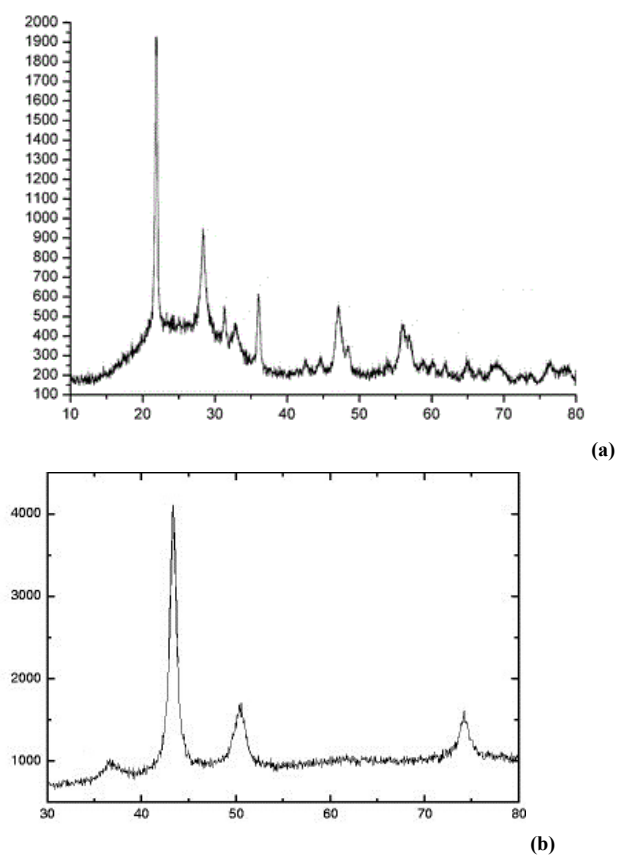
**Figure 7.** Small-Angle Neutron Scattering (SANS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



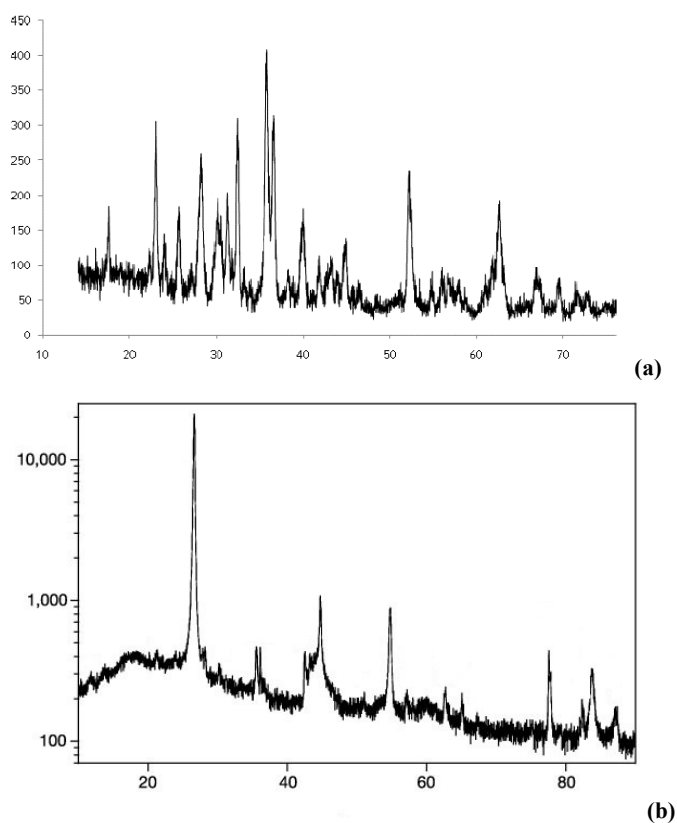
**Figure 8.** Grazing-Incidence Small-Angle Neutron Scattering (GISANS) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



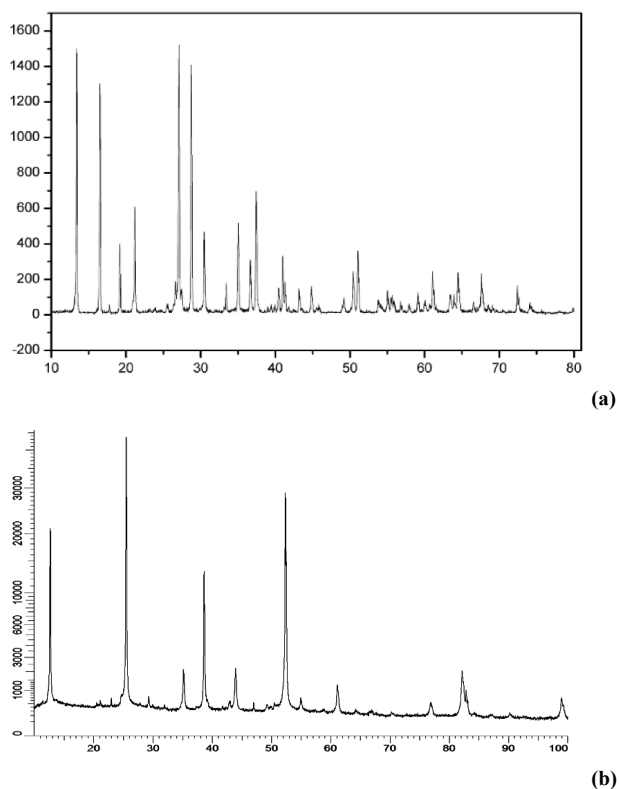
**Figure 9.** X-Ray Diffraction (XRD) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



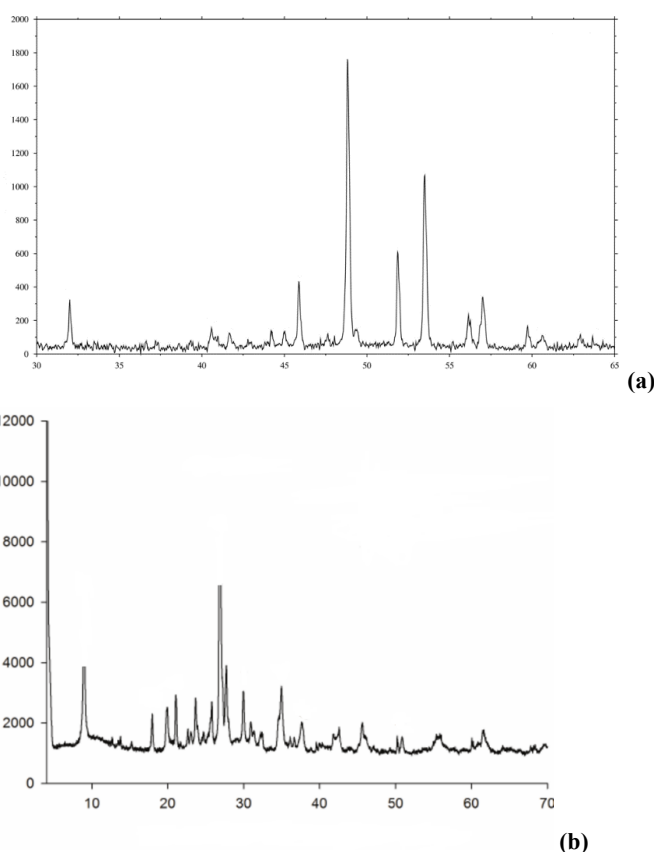
**Figure 10.** Powder X-Ray Diffraction (PXRD) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



**Figure 11.** Wide-Angle X-Ray Diffraction (WAXD) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



**Figure 12.** Grazing-Incidence X-Ray Diffraction (GIXD) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]



**Figure 13.** Energy-Dispersive X-Ray Diffraction (EDXRD) analysis of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues with the passage of time [1-198]

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