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# Fluorescence Emission Spectra of Kidney Cancer

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**Key-words:**
Kidney cancer tissue (Malignant & Normal),
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emission spectra.

**Abstract:** In emission spectra, 280 nm is kept constant excitation and we record the fluorescence emission spectra spectra of same organs of Malignant & Normal tissue of kidney cancer. Both the spectra compares with each other and determined in the intensity ratio of cancer to normal kidney tissue. We also determine the band structure of Kidney Cancer of emission spectra.

**INTRODUCTION,**

As excitation and emission spectroscopy of the tissue provide information about their architectural organization and their Metabolic state. By characterizating both exogenous and endogenous fluorophores present in the tissue several groups have reported the use of fluorescence spectroscopy in the diagnosis of various cancer such as breast ,cervix ,stomach ,esophagues ,colon and skin (1,2). It has been considered as a potential non invasive diagnostic tool for differentiating normal from cancer human tissues. We have already reported the use of fluorescence spectroscopy in the characterization of various condition of oral lesson on hamster cheek pouch animal tumor model(3) In this work, we have to aimed to extend our study in the characterization of human kidney tissue, normal from Malignant tissues by means of both excitation and emission spectroscopy in visible region.

In this technique discrimination potential depends on the various emission and excitation spectra which could change the tissue morphology and the composition due to the repeated exposure during the spectral measurement. Also the overlapping spectral feature representative of a complex mixture of bimolecular is of the useless. The fluorescence spectra are recorded for different samples of kidney cancerous and normal human tissues. From the study it is observed that there is a increase in emission of NADH, flavin and porphyrin and also increase hemoglobin reabsorption as the tissues progresses from normal in to malignant.(4,5)

Several researchers studied the fluorescence spectra of human cancer tissues in details. The experiment done on the study of the LIF spectra from human cancer tissues by S.K. mujumdar and Leo Wollweber(6) The results of the excitation/ emission Spectroscopic study on human cancerous and normal breast cells suggested higher concentration of tryptophan and NADH in cancerous cells compared to the normal cells.

W.Glassman et al(7) have reported the difference in emission spectra of malignant and non-malignant gynecological tissues. In their analysis they attributed the spectral peaks to NADH collagen and elastein molecules and structural changes of the mucosa. The present study describe fluorescence emission spectra for detection and diagnosis of kidney cancer human tissues.

**Material and method :-**

The samples of normal and cancerous kidney tissues were obtained from R.S.T. cancer hospital Nagpur (M.S.) and S.N.D. cancer hospital Aurangabad (M.S.). Specimens were not chemically treated prior to taking measurement samples of random endoscopic studies. The size of the samples averaged

approximately 10x20x2mm$^3$. A Spectrofluorometer (Hitachi model No. F2000) was used for measuring the fluorescence spectra of kidney human tissue. In the present work twenty five (Malignant and normal) samples are collected for the study of their fluorescence spectra. The collected samples are affected by squamous cell carcinoma, emission spectra of the tissue samples were recorded using experimental set up. Instrument has a Xenon Lamp as the source of exciting light. The excitation and emission monochromator are placed 90$^0$ to each other and light is made to fall on the samples through PMT tube. We have recorded fluorescence emission spectra of malignant and normal kidney tissue.

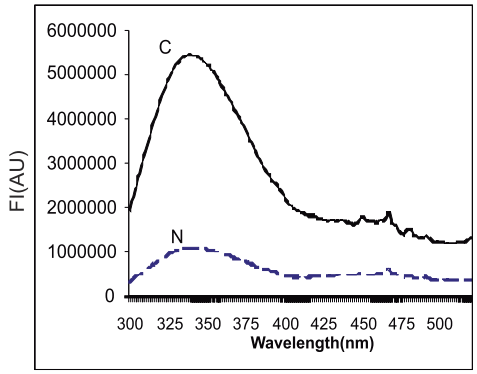
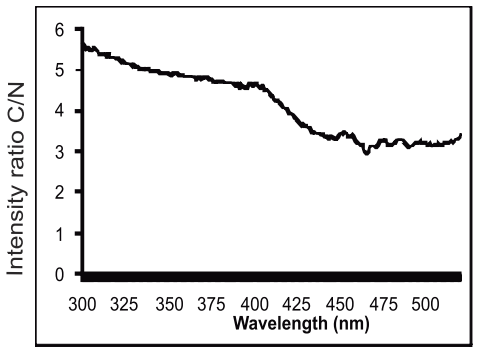



***Figure (a): Emission spectra of cancer and normal tissues of Kidney cancer***




***Figure(b): Intensity ratio C/N of Kidney cancer of Emission spectra***

**Results and Discussion :-** Fig (a) snows the fluorescence emission spectrum of the normal and malignant Kidney tissue with the averaged difference spectrum between them at 280 nm excitation. We have recorded Fluorescence spectra of normal and cancer from the same organs in the spectral range 300-540 nm respectively. For 280 nm excitation, both spectra snows primary emission peak around 333 nm due to presence of tryptophan, It is also observed that the fluorescence intensity due to tryptophan increases with increasing influence of the cancer of human kidney tissue. The emission Fluorescence spectra show peak near 340 nm. The intensity of emission spectrum around 340 nm cancerous tissues is more than that of normal tissues. Cancerous tissues have more intensity because Cancer cell have more concentration of the molecules like a tryptophan. The muscles of the kidney emits spectra having peak at the wavelength 333, 450, 468, 480 and 490 nm which may be attributed to the presence of elastein, the coenzyme Nicotinamide. Adenine Dinucleotide (NADH) prophyrin and coenzyme, flavin adenine Dinucleotide (FAD). By Comparing the heights and widths of the peaks in the spectra of normal and cancerous tissues. They can he distinguished from each other.

Fig. (b) The observed ratio of integrated Fluorescence intensity of cancerous to adjoining normal tissue was 5.7 and at their corresponding peak wavelength and corresponding ratio cancerous to normal at nitrogen laser wavelength was 5.6 We have included the column containing the intensity ratio at nitrogen laser wavelength to study the potential of nitrogen laser as a excitation source.

The energy band structure of kidney cancer and normal tissue of Emission spectra as shown in figure (c) the Cancer tissue in different stages might show different features and we are sure that the different stages of cancer may be detected by the band structure. The energy band structure also shows that the two photons spectroscopy may be highly useful for the diagnosis of the kidney cancer of human tissue.
the Cancer tissue in different stages might show

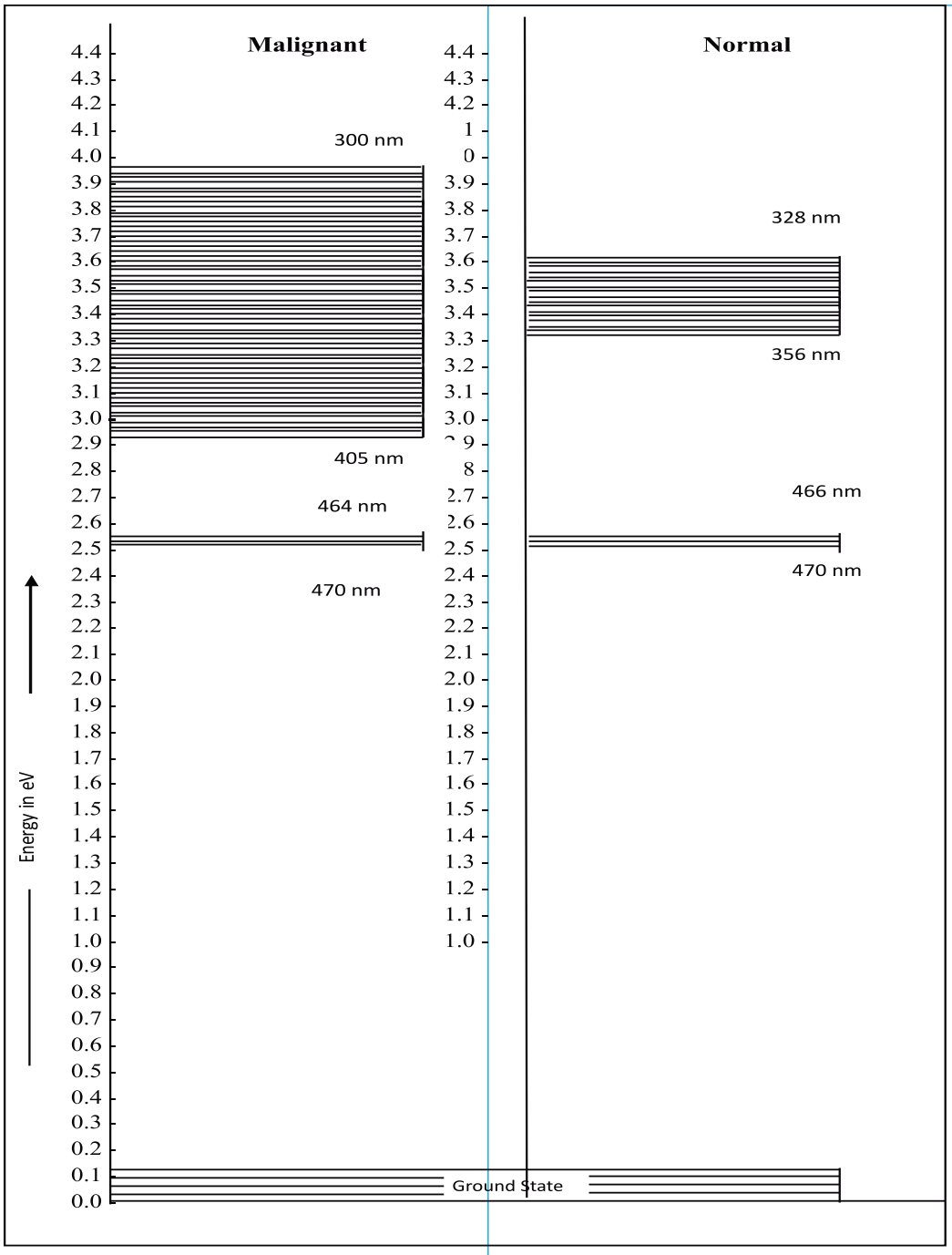



*Figure (c): Energy band structure of Kidney cancer of Emission spectra Conclusion:-*

**Conclusion :**

The emission fluorescence spectra of the normal and cancerous kidney tissues show that the cancerous tissues can be very easily distinguished from normal human tissues. The cancerous tissues in different stages might show different features and we are sure that the different stages of kidney cancer may be detected by emission spectra.

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