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TWO-WAVELENGTH DYE LASER FOR APPLICATION IN PDT METHOD TREATMENT OF CANCER

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The construction and basic characteristics of two-wavelength dye laser system purposely constructed for diagnosis and treatment of cancer using PDT method e.g. [1,2] with hematoporphyrin derivative (HpD) has been presented. The requirements for this construction have been worked out on the basis of principle literature [2,3] and of polish investigations e.g. [4] in the PDT method.

Our dye laser is a generator of 405nm or 630nm wavelength radiation. The wavelength 405nm is diagnosis line and 630nm is the therapy one. In our system it is gained through excitation by an excimer laser radiation [5] of one of LC4090 or LC6400 dyes alternately placed in a stable resonator of the laser dye. The resonator has an output dielectric mirror with two maxima (for 405 and 630nm) in its transmission characteristic. The dyes are placed in a double dye cell. In one part of the cell there is LC4090 dye dissolved in dioxan while in the other one Rhodamine 101 (LC6400) dissolved in ethanol. The "up and down" change of the cell position in the resonator is done mechanically, guaranteeing the generation is approximately the same and reaches 10%. The solution of both dyes of 0.25 litre volume are placed in cooled reservoirs. They are pumped to the respective cell's using wave-pumps. The basic characteristics of our dye laser have been presented.

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