



## EFFECTS OF LASER IRRADIATION ON NORMAL AND ANEMIC HUMAN BLOOD

Imad Al - Deen Hussein Ali Al - Saidi <sup>1\*</sup>, Majdi Faisal Majeed <sup>2</sup>, Ikram Kamal Jasim <sup>3</sup>

<sup>1,2</sup> Department of Physics, College of Education for Pure Sciences, University of Basrah, Basrah, Iraq

<sup>3</sup> Department of Anatomy and Histology, College of Veterinary, Medicine, University of Basrah, Basrah, Iraq

DOI: <https://doi.org/10.29121/granthaalayah.v8.i8.2020.862>



Article Type: Research Article

Article Citation: Imad Al - Deen Hussein Ali Al - Saidi, Majdi Faisal Majeed, and Ikram Kamal Jasim. (2020). EFFECTS OF LASER IRRADIATION ON NORMAL AND ANEMIC HUMAN BLOOD. International Journal of Research -GRANTHAALAYAH, 8(8), 256-261. <https://doi.org/10.29121/granthaalayah.v8.i8.2020.862>

Received Date: 25 July 2020

Accepted Date: 31 August 2020

Keywords:

Laser Irradiation  
Normal and Anemic Human Blood  
Optical Properties of Human Blood

### ABSTRACT

The effects of laser irradiation on the whole human blood were studied. The blood samples were taken from healthy donors with normal blood and donors with anemic blood. The blood samples were exposed to laser radiation. Two lasers of the same types, continuous wave (CW) diode pumped solid-state lasers (DPSSL's) were used to irradiate the blood samples. One of these laser has a wavelength 532 nm (green laser beam) while the other laser has a wavelength 671 nm (red laser beam). The output power of the two lasers can be varied over the range 0 - 100 mW. In the present study, the output power was fixed at 20 mW for both lasers. The blood samples were exposed to different irradiation times, 5, 15, and 30 min. Significant changes in the optical parameters of the irradiated blood samples were observed in comparison with that of the un-irradiated blood samples (the control samples). These optical parameters were determined from the measured absorbance spectra of the un-irradiated and irradiated samples. The absorbance spectra were measured using UV-Visible double-beam spectrophotometer operating over wavelength range 190 - 1100 nm.

The results of the present study revealed that the laser irradiation produce considerable effects on the human blood samples, suggesting suitability of the laser beam irradiation for the biological and medical applications.

### 1. INTRODUCTION

Laser beam radiation has been widely used in a variety of applications, such as, physical, chemical, biological and medical fields [1], [2], [3], [4], [5], [6], [7]. The advantage of using the laser beam in these fields is its distinctive characteristics. The laser emits intense, monochromatic, and coherent beam. Furthermore, the laser can be easily controlled and its highly collimated nature enables it to be focused into a small area to produce high incident intensity [8].

Investigation of the effects of interaction of laser radiation with biological tissues and blood is of great interest and has received considerable attention [4], [5], [9], [10], [11], [12], [13], [14].