

He-Ne激光照射对血液及其组分荧光光谱影响的实验研究

降雨强、李昌勇、王晓波、肖连团、贾锁堂

山西大学物理电子工程学院, 量子光学与光量子器件国家重点实验室

为研究弱激光照射对人血液携氧能力的影响及机制, 我们用荧光仪分别测量了He-Ne激光照射前后正常血液及其组分(血浆、红细胞)的荧光光谱, 研究了激光照射导致的光谱变化, 并分析了光谱变化与血液携氧能力改变的关系。实验结果显示: 全血液标本在490 nm及614 nm附近有荧光峰值; 血浆的荧光则主要分布在420~500 nm之间; 红细胞在500 nm及614 nm附近有荧光。He-Ne激光照射后, 全血液及红细胞在614 nm处的荧光谱都有较明显的变化, 且较相似。由此可得出结论, He-Ne激光照射可影响血液的携氧能力。

THE EXPERIMENTAL INVESTIGATION OF THE FLUORESCENT SPECTRA OF HUMAN BLOOD AND ITS COMPONENTS

In order to investigate whether or not the He-Ne laser irradiation can affect the oxygen carrying ability of blood. The fluorescent spectra of human blood and its components before and after irradiated by He-Ne laser was investigated. The results show that the fluorescence spectra of human whole blood and red blood cells (RBC) both have an obvious peak at 614 nm. After irradiated by He-Ne laser for 10 min, it was found that the peak became flat. A conclusion can be drawn that He-Ne laser irradiation can affect the RBC structure and improve the oxygen carrying ability of blood.

关键词

荧光光谱(Fluorescence); 激光照射(Laser irradiation); 血液(Blood); 红细胞(Red blood cell); 氧(Oxygen)