

DEVELOPMENT OF A PROTOTYPE ILLUMINATION SYSTEM FOR PHOTODYNAMICAL TREATMENT OF BIOLOGICAL SAMPLES

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Most of living creatures including bacteria are more or less sensitive to the light, especially when optically active materials like photosensitizers are present. Light photons are some of kind of energy, which can be directly transferred into the cell of molecule, and photochemical and photobiological reaction take place. Such reactions are of rising importance since in combination with natural photosensitizers they can be applied as the antimicrobial and antifungal technologies for food industry or even spacecraft environment.

However, for bio-technology development proper test equipment is needed. During the photodynamical experiments certain experimental conditions must be kept constant in order to minimize uncertainty and maintain traceability. Therefore, we report on design of smart, computer controlled illumination system. Mechanical, optical and thermal design of the prototype was designed. The system is equipped with thermal and optical feed-back loops to compensate aging and temperature caused drift of illumination intensity. The constant (ambient) temperature of the sample is controlled by continuous airflow.

We conclude, that such a illumination system (chamber) could be a useful tool for investigation of photobiological and photochemical reactions and photodynamical processes.

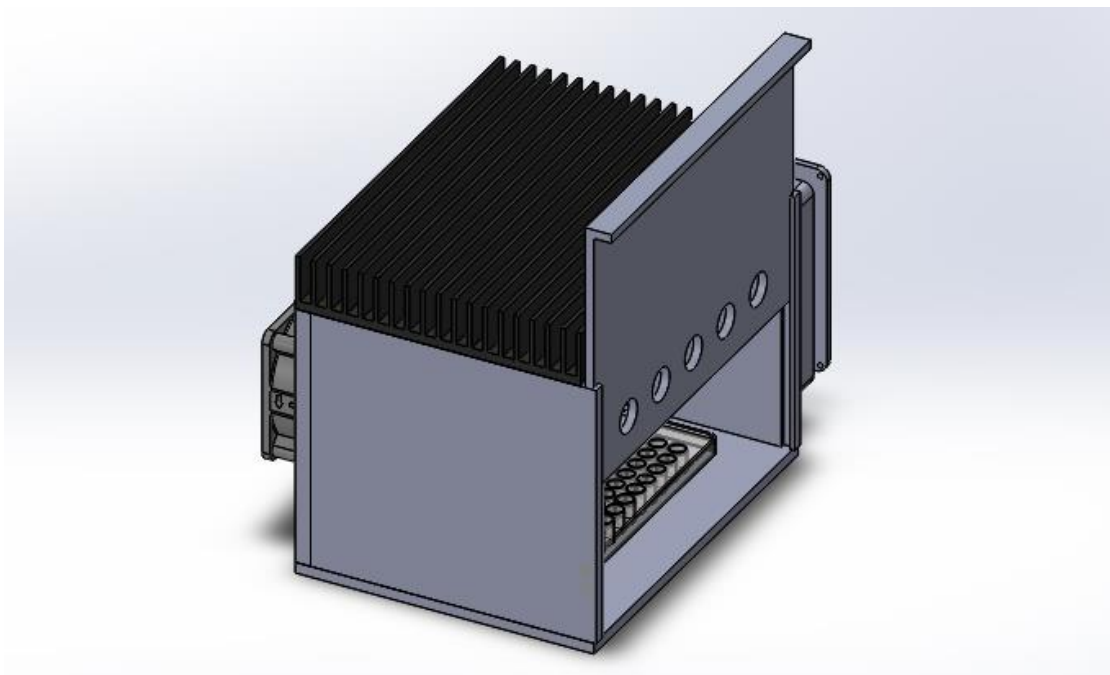


Fig. 1. Design of Prototype illumination system.