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Pulsed light (PL) is a non-thermal technology used in food, pharmaceutical and cosmetic industries. PL decontaminates surfaces and packaging materials and eliminates pathogenic and spoilage agents such as bacterial and fungal spores (conidia). PL inactivates microorganisms by exposing them to intense (> 1000 W/cm^2) white light pulses for very short time (250 µs). The xenon-light source emits a broad-spectrum light pulse with wavelengths ranging from 200 to 1100 nm, and containing 24% of UV. The aim of this study was to evaluate how specific are the inactivation effects of PL compared to UVC. We first investigated the germicidal effects of both technologies, and then we evaluated the degradative effects on spore proteins.

We found that the germicidal effects of both PL and UVC technologies are strain-dependent. A high variability in sensitivity was observed. For example, the PL and UVC fluences required for 4 log-reduction of *Bacillus weihenstephanensis KBAB4* and *Bacillus thuringiensis* 407 spores less than 1 J/cm^2 and 0.09 J/cm^2, respectively. Two- to four-fold higher fluences were needed to obtain the same reduction with resistant spores of strains *B. pumilus* SAFR-032 and *B. cereus* AH187. Interestingly, we highlighted a significant correlation (P <0.0001) between the sensitivity of eight *Bacillus* spores, indicating that the bacterial spore sensitivity to UVC is a good predictor of the sensitivity to PL. However, UVC-exposure needs to be 10^5 time longer than PL-exposure to obtain the same inactivation efficiency. Importantly, PL showed a higher efficiency than UVC to inactivate conidia of *Aspergillus brasiliensis*.

To determine whether PL and UVC degrade proteins of *Bacillus pumilus* spores and identify the targets of these two treatments, we used a shotgun proteomics approach to compare the proteome of UVC-and PL-treated spores to the proteome of untreated spores from four independently prepared batches. Overall, the results showed poor degradation of proteins (2 to 4% of 1357 spore proteins detected). However, for similar log-reductions, the number of proteins targeted by PL was 10-fold higher than that obtained with UVC, and the PL-targeted proteins are different from UVC-targets. A similar work (results in progress) is performed with *A. brasiliensis* conidia.