Supplementary Materials

In the bioreactor, a critical eddy length (λ_C) of approximately 70 µm was obtained. Regarding the analysis of cell dimensions, Figure 1 shows the general distribution of cell size. The cells have dimensions ranging from 6.4 ± 1.5 µm, with a maximum value of 12.9 µm. Thus, it was confirmed that the λ_C value resulting from the application of a Ni = 500 rpm is significantly larger than the diameters of the *Chlorella vulgaris* cells found in this study and therefore does not represent a risk to their integrity. Figure 2 shows an example of the 24th day cell diameter determination.

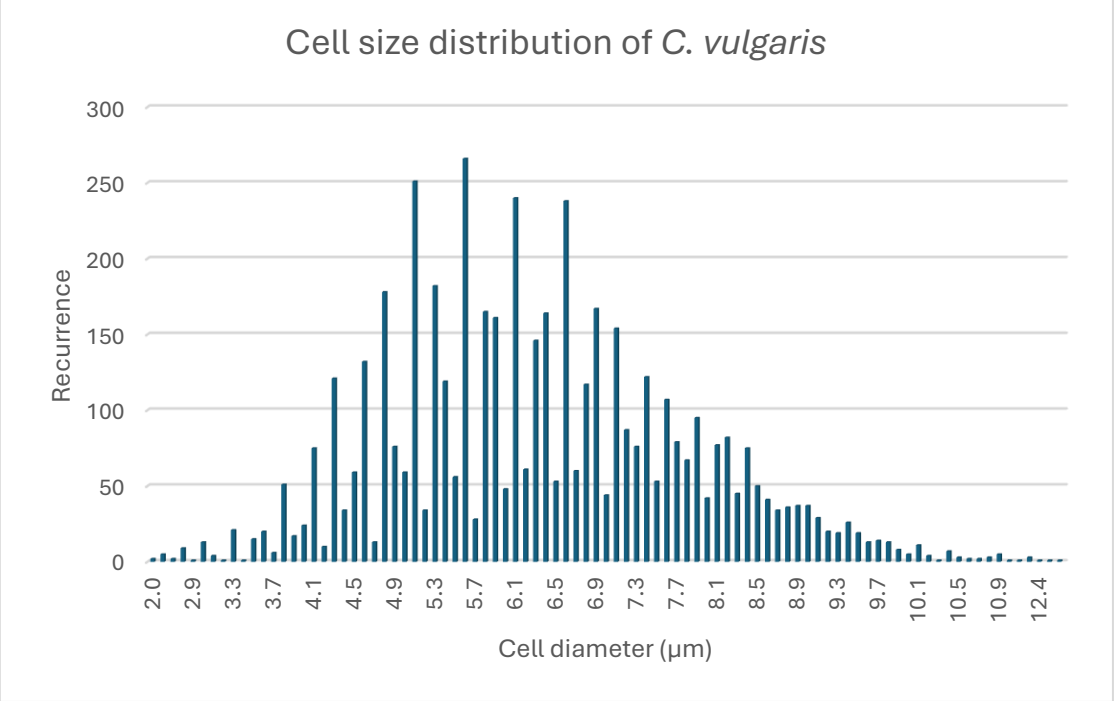


Figure S1. Distribution of cell size in bioreactors

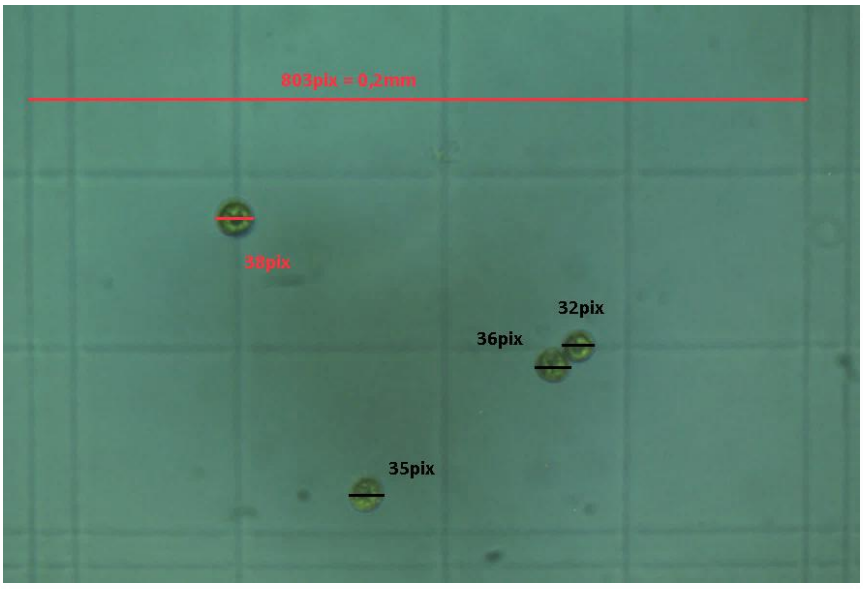


Figure S2. Cell *C. vulgaris* size measurement. The image corresponds to the 24th day of culture

Correlation between Biomass and Cell Count (R^2: 0.957):

$$Biomass\ (g/L) = 5.439E^{-8} \cdot [Cell\ count, cells/mL]$$

Device prepared for illuminating systems with LED sources:

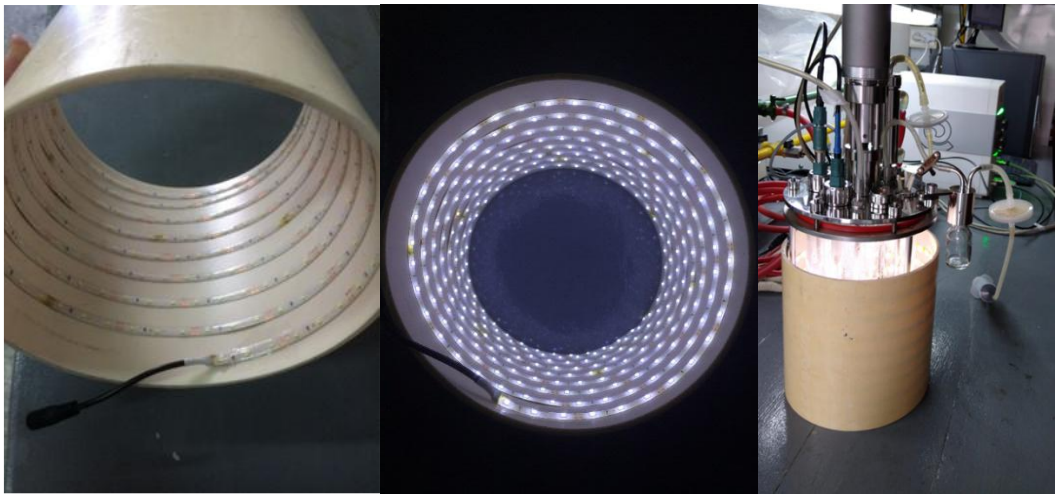


Figure S3. Device prepared for illuminating systems with LED sources

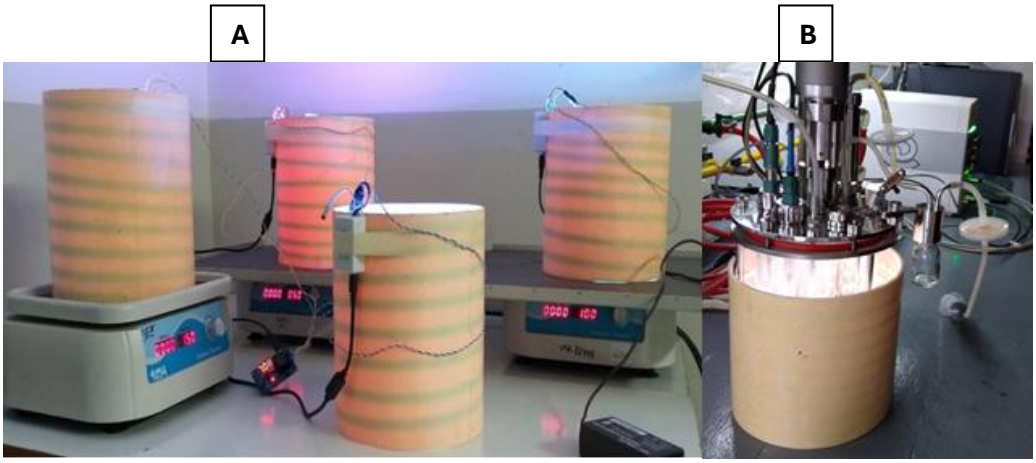


Figure S4. **A.** Erlenmeyer flasks were located on the orbital shaker and therefore, they remained completely covered by the illumination device. **B.** Bioreactor surrounded by the illumination device.