

Supplementary information

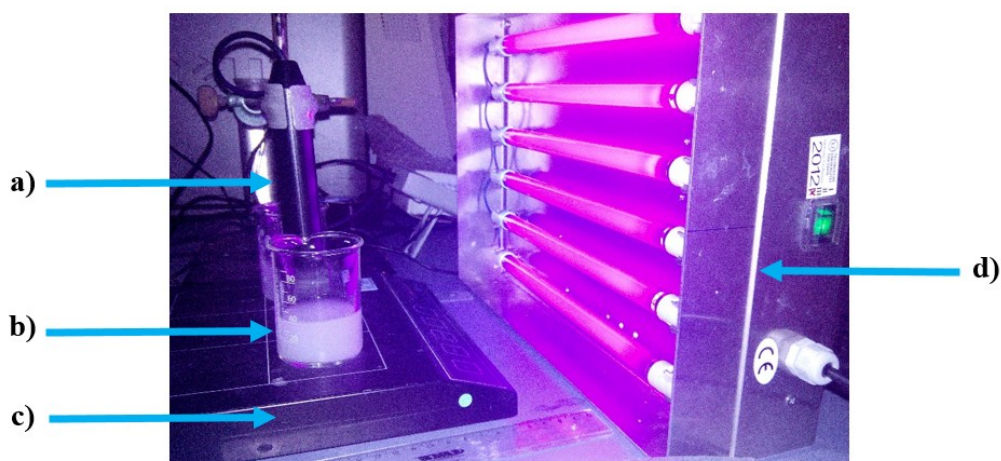


Fig. S1. Photoreactor schematic representation. a) Luxmeter, b) ciprofloxacin solution, c) Magnetic stirrer and d) UV lamps.

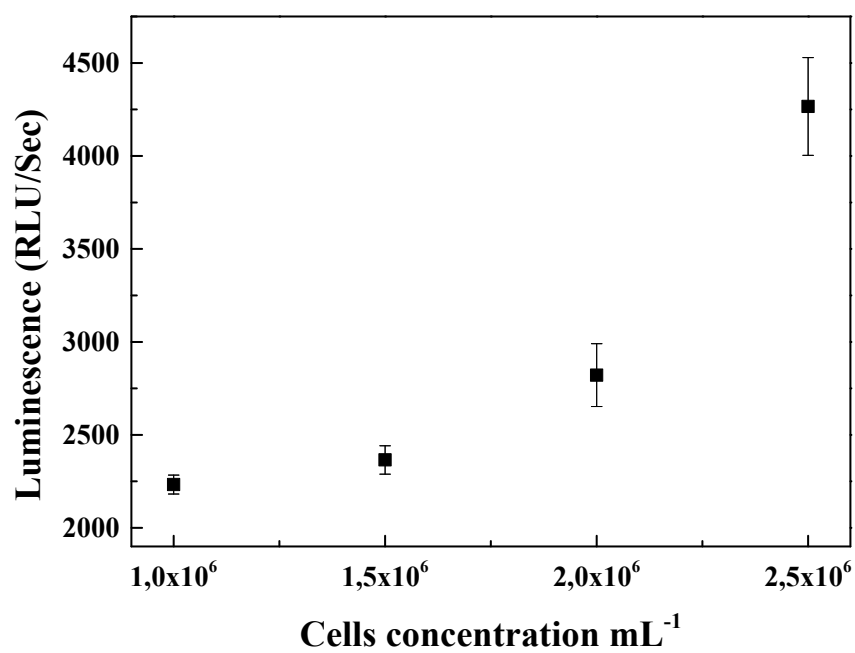


Fig. S2. *Vibrio fischeri* luminescence signal according to the cells concentration.

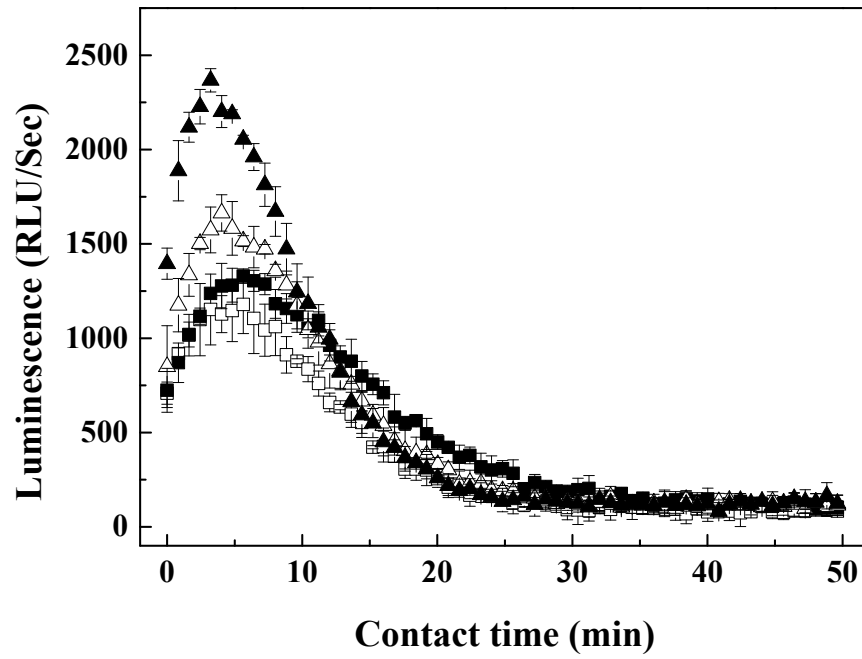


Fig. S3. *Vibrio fischeri* luminescence response to $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, at increasing bacteria concentration 1.0×10^6 (□), 1.5×10^6 (■), 1.5×10^6 (Δ) and 2.5×10^6 (▲) cells mL^{-1} .

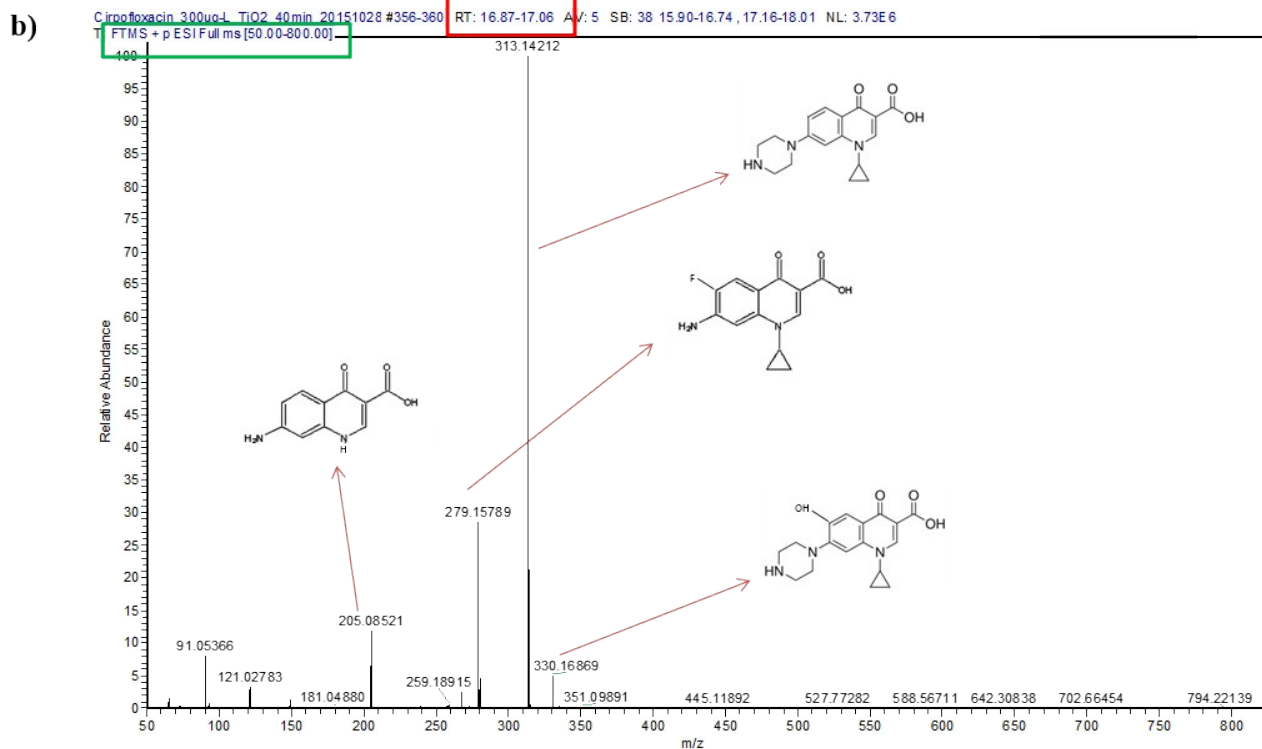
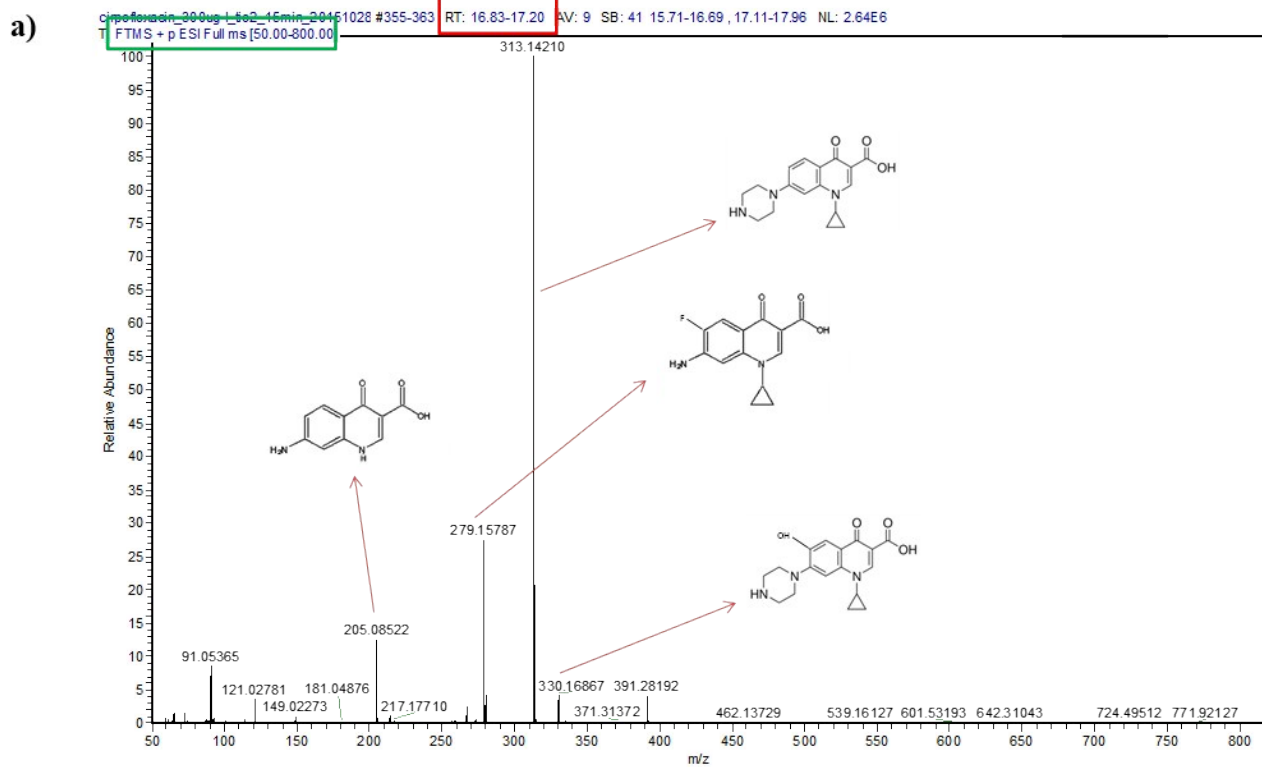


Fig. S4. Ms spectra of samples of CIP treated by UVA/TiO₂ after 15 min (a) and 45 min of treatment (b), at retention time 16.9 min and assigned molecular structures.

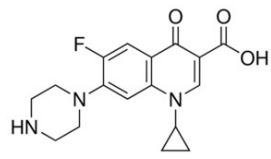
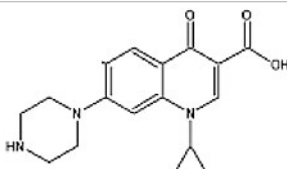
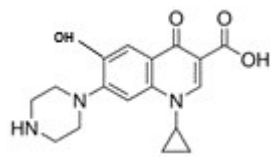
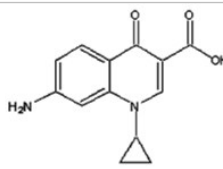
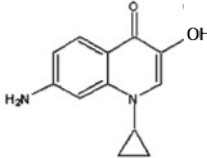
Tables

Table S1. HPLC degraded samples analysis. The table present the retention time, peak area and the estimated concentration of CIP.

| Degradation time (min) | Retention time (min) | | Peak area (a.u.**) | | Concentration ($\mu\text{g L}^{-1}$) | |
|------------------------|----------------------|------------------|--------------------|------------------|--|------------------|
| | ZnO | TiO ₂ | ZnO | TiO ₂ | ZnO | TiO ₂ |
| -30* | 13.189 | 13.189 | 15919 | 17201 | 266.182 | 285.681 |
| 0 | 13.189 | 13.189 | 4831 | 199 | 97.586 | 42.36 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 | 0 | 0 | 0 | 0 | 0 | 0 |
| Control | 13,189 | | 18348 | | 303,130 | |

(*) – Sample just with the antibiotic (before the photocatalytic degradation; (**) – a.u. - arbitrary units.

Table S2. Retention time (of maximal intensity), m/z and the molecular structure of the suggested by-products obtained in the photocatalytic degradation of CIP with TiO₂ nanoparticles.

| ID intermediate | Retention time (min) | m/z molecular ion | Molecular structure |
|-----------------|----------------------|---------------------|---|
| CIP | 13.2 | 332 |  |
| P1 | 16.90 | 313 |  |
| P1' | 16.90 | 330 |  |
| P2 | 15.4 | 244 |  |
| P3 | 6.90 | 217 |  |

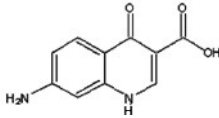
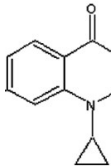
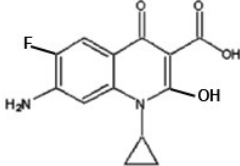
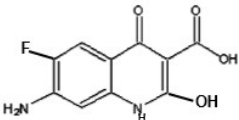

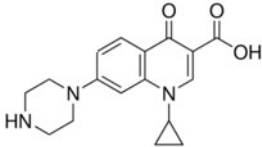
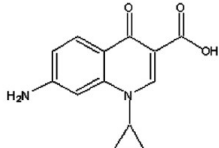
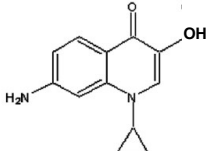
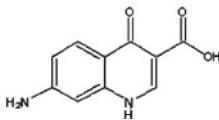
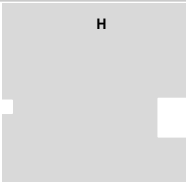
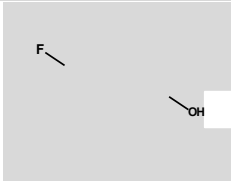
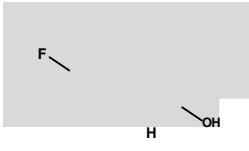
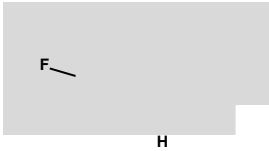

| | | | |
|-----------|-------|-----|---|
| P4 | 16.87 | 205 |  |
| P5 | 6.70 | 186 |  |
| P6 | 16.90 | 278 |  |
| P7 | 14.50 | 239 |  |

Table S3. Retention time (of maximal intensity), m/z and the molecular structure of the suggested by-products formed in the photocatalytic degradation of ciprofloxacin with ZnO nanoparticles, after 45 minutes.

| ID intermediate | Retention time (min) | m/z molecular ion | Molecular structure |
|------------------------|-----------------------------|---------------------------------------|---|
| CIP | 13.2 | 332 |  |
| P1 | 16.90 | 313 |  |
| P2 | 15.10 | 244 |  |
| P3 | 6.90 | 217 |  |
| P4 | 16.90 | 205 |  |

| | | | |
|------------|-------|-----|--|
| P5' | 18.70 | 231 |  |
| P6 | 15.10 | 278 |  |
| P7 | 14.50 | 239 |  |
| P8 | 14.50 | 223 |  |
| P9 | 15.10 | 288 |  |