Supplementary Materials

Photodynamic polymers constituted by porphyrin units as antibacterial materials

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1. Chemicals

Compounds were obtained from Sigma-Aldrich (Milwaukee, WI, USA) that were used without further purification. Organic solvents (GR grade) from Merck (Darmstadt, Germany) were distilled and maintained on molecular sieves. Ultrapure water was obtained from a Labconco (Kansas City, MO, USA) equipment model 90901-01. Silica gel thin-layer chromatography (TLC) plates (250 microns) were acquired from Analtech (Newark, DE, USA) and silica gel 60 (0.040-0.063 mm, 230-400 mesh) from Merck (Darmstadt, Germany). Tryptic soy (TS) broth and agar from Britania (Buenos Aires, Argentina) were used in microbial cultures. Microtiter plates (96-well) were acquired from Deltalab (Barcelona, Spain).

2. Instrumentation

Proton nuclear magnetic resonance spectra were performed on a FT-NMR Bruker Advance DPX400 at 400 MHz (Bruker BioSpin, Rheinstetten, Germany). Mass spectra were recorded on a Bruker micrOTOF-QII (Bruker Daltonics, Billerica, MA, USA) equipped with an ESI source (ESI-MS). UV-visible absorption spectra were carried out on a Shimadzu UV-2401PC spectrometer (Shimadzu Corporation, Tokyo, Japan). Fluorescence emission spectra were performed on a Spex FluoroMax spectrofluorometer (Horiba Jobin Yvon Inc, Edison, NJ, USA). Scanning electron microscopy (SEM) images were obtained with a field emission scanning electron microscope FE-SEM (Σigma Zeiss, Oberkochen, Germany) with a thin Cr film on the sample surface and an acceleration voltage of 5 kV. A Radiometer Laser Mate-Q (Coherent, Santa Clara, CA, USA) was used to determine the light fluence rates. Steady state photolysis in solution were performed with a Cole-Parmer illuminator 41720-series (150 W halogen lamp, Cole-Parmer, Vernon Hills, IL, USA) in combination with a high intensity grating monochromator (Photon Technology Instrument, Birmingham, NJ, USA) [1]. This arrangement produces a light fluence rate of 0.38 mW/cm^2 at 430 ± 6 nm. Samples were irradiated in a quartz cell of 1 cm path length at room temperature. Cell suspensions were irradiated with a Novamat 130 AF (Braun Photo Technik, Nürnberg, Germany)

projector containing a 150 W lamp. A 2.5 cm glass cuvette filled with water without circulation was used to remove the heat from the lamp. A wavelength range between 350 and 800 nm was selected by optical filters. The projector was placed vertically with the light beam focused on the 96-well microtiter plate lid, producing a fluence rate of 90 mW/cm^2 [2]. Microscopic observations were made with an inverted fluorescence microscope (BIM500FL, Bioimager, ON, Canada). Optimized structures of the polymers were optimized using the Forcite molecular mechanic module of the Materials Studio Software (BIOVIA, Dassault Systèmes, San Diego, CA, USA).

3. Supporting figures

Figure S1. Photographs of **TCP-P** in methanol (right tube) and after centrifugation (left tube).

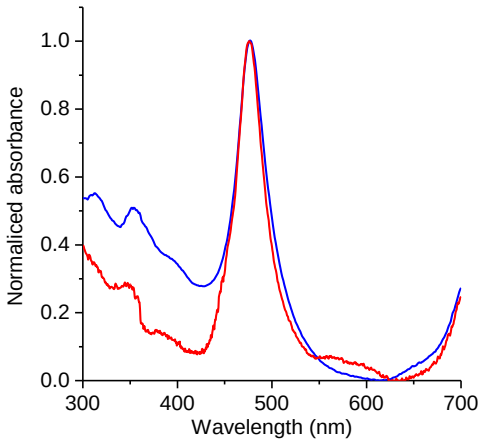

Figure S2. UV-visible absorption spectra of oxidative polymerizations to obtain **TCP-P** (blue solid line) and **ZnTCP-P** (red solid line) in DMF.

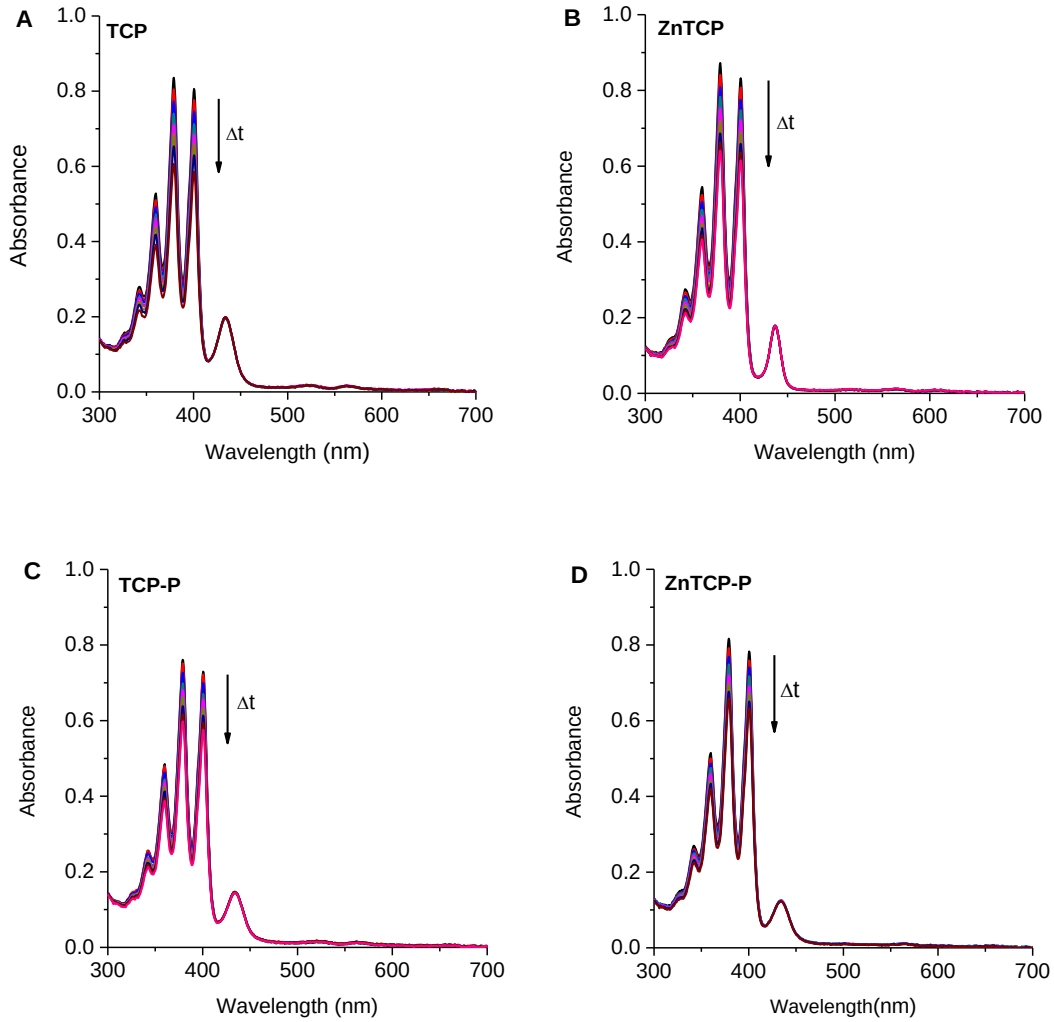

Figure S3. Absorption spectral changes during the photooxidation of DMA sensitized by (A) **TCP**, (B) **ZnTCP**, (C) **TCP-P** and (D) **ZnTC-P** in DMF at different irradiation times (Δt = 180 s), λ_{irr} = 430 nm.

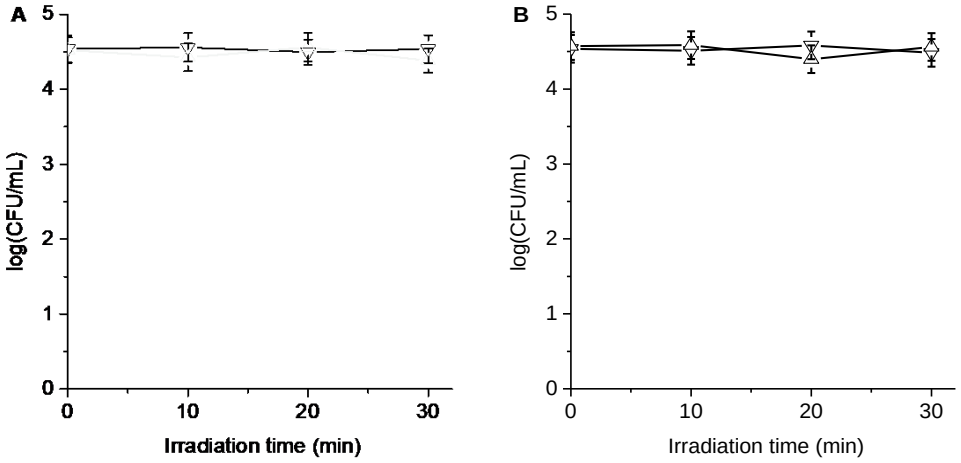

Figure S4. Survival curves of *S. aureus* (~10^4 CFU/mL) treated with (A) 2 µM and (B) 4 µM **TCP-P** (▼) and **ZnTCP-P** (▲) for 30 min at 37 ºC in the dark and incubated for different times in the dark.

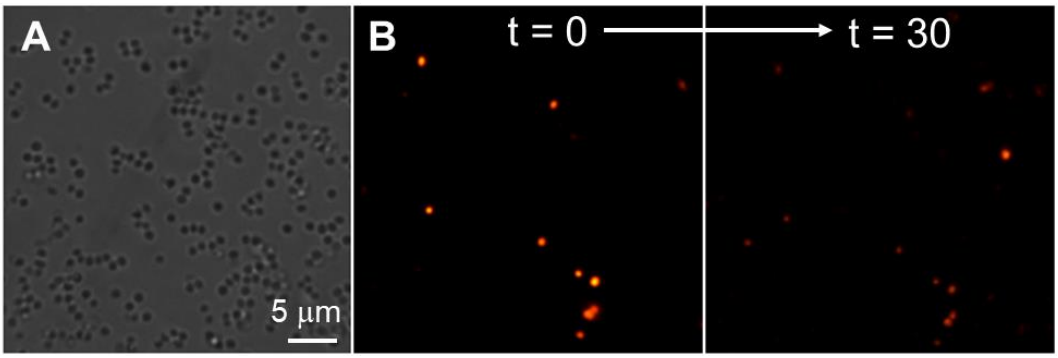

Figure S5. Microscopy images of *S. aureus* in the dark and then irradiated with green light for different times; column A: cells under bright field; columns B: fluorescence emission of PI.

4. References

1. Pérez, M. E.; Durantini, J. E.; Reynoso, E.; Alvarez, M. G.; Milanesio, M. E.; Durantini, E. N. Porphyrin-schiff base conjugates bearing basic amino groups as antimicrobial phototherapeutic agents. *Molecules* **2021**, *26*, 5877.

2. Santamarina, S. C.; Heredia, D. A.; Durantini, A. M.; Durantini, E. N. Antimicrobial photosensitizing material based on conjugated Zn(II) porphyrins. *Antibiotics* **2022**, *11*, 91.