

Supplementary Materials for

Phototherapy and extracorporeal membrane oxygenation facilitate removal of carbon monoxide in rats

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Fig. S1. Development of the CO photo-remover.

Fig. S2. Light sources.

Fig. S3. Hemodynamics during CO poisoning and treatment by breathing air with or without ECCOR-P.

Legend for data file S1.

Other Supplementary Material for this manuscript includes the following:

(available at stm.sciencemag.org/cgi/content/full/11/513/eaau4217/DC1)

Data file S1. Raw data (provided as separate Excel file).

Supplementary Material

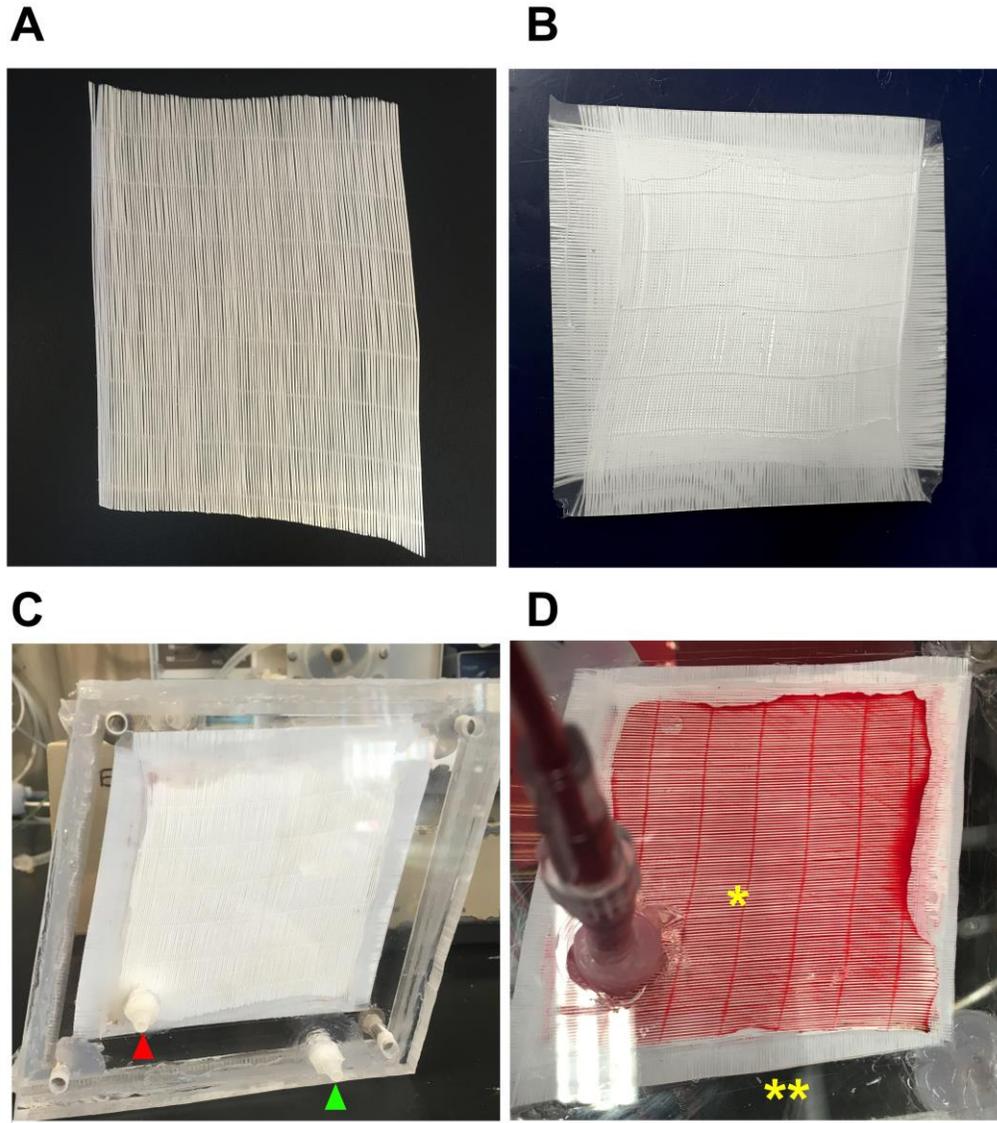


Fig. S1. Development of the CO photo-remover.

To build a CO photo-remover for blood phototherapy, 7x7 cm capillary membrane sections were obtained from a cardiopulmonary bypass oxygenator (A). Eight layers of capillary membranes were woven and sealed with silicone rubber (B). The capillary membrane was placed between two custom made clear plexiglass sheets and sealed with silicon (C). Two openings for the blood (red arrowhead) and the gas (green arrowhead) inlets and outlets were made on each side and tubing connectors were inserted. Silicone rubber was used to seal the extremities of the plexiglass case, creating a sealed blood compartment (* in D) at the center and a sealed gas compartment (** in D) at the periphery.

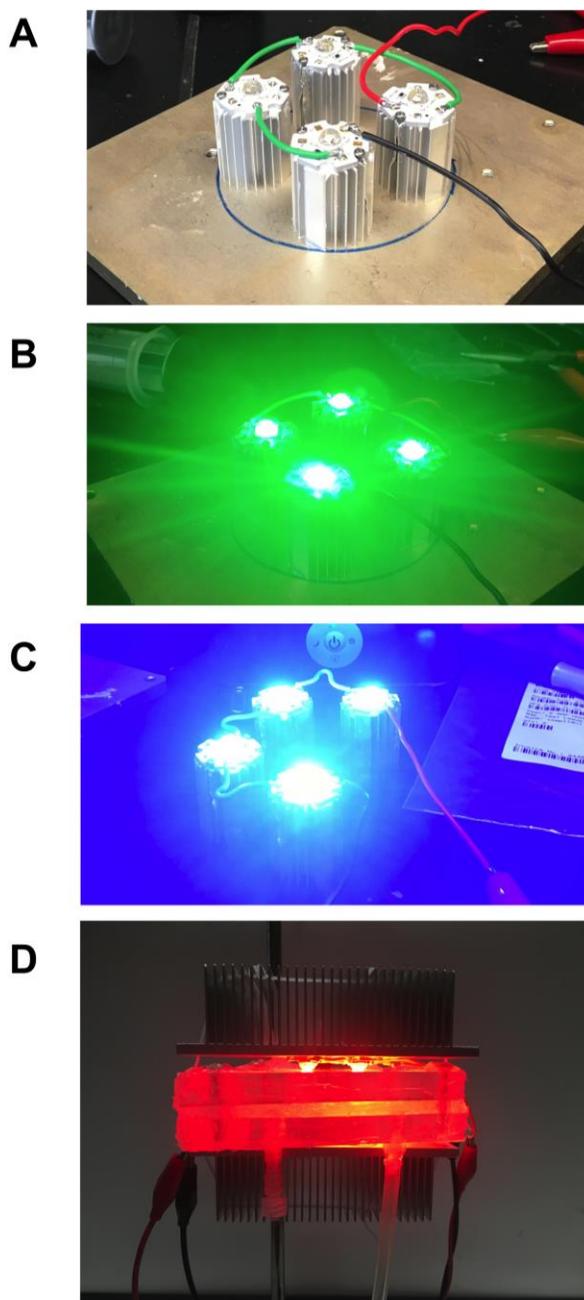


Fig. S2. Light sources.

Custom made light sources (A) were constructed using high power green (523 nm, Panel B), blue (460 nm, Panel C) and red (623 nm) LEDs. The maximum power of each LED was 750 mW, as measured using a power meter. Heat sinks were used to dissipate heat generated during LED operation. Panel D depicts red LEDs with heat sinks irradiating the CO photo-remover on both sides (in this panel light power was reduced for picture acquisition).

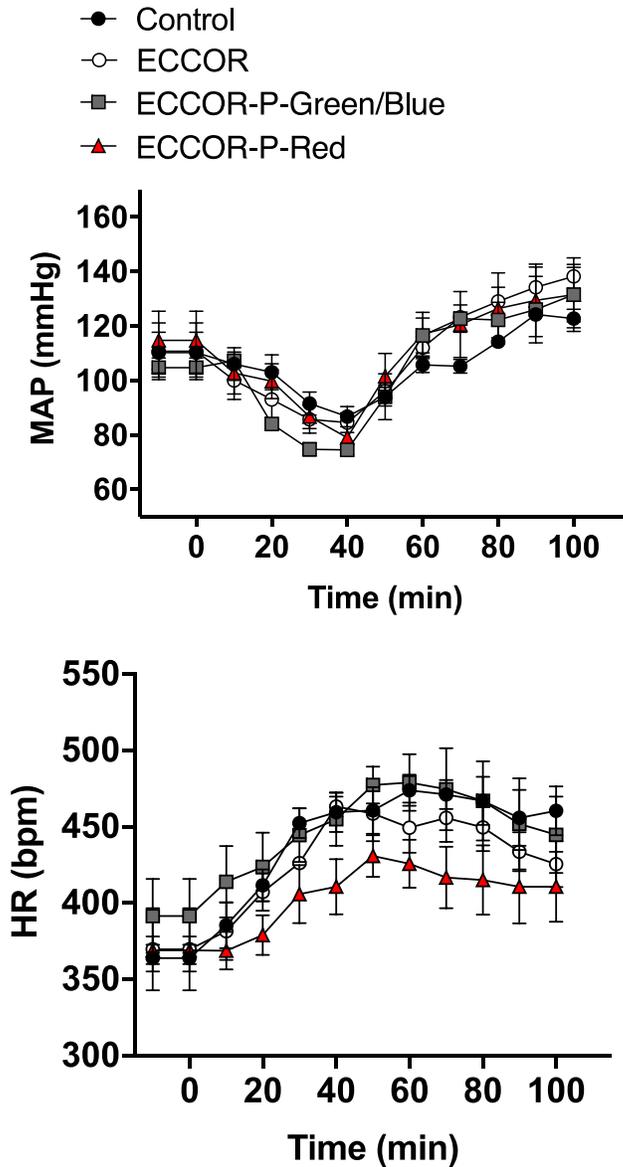


Fig. S3. Hemodynamics during CO poisoning and treatment by breathing air with or without ECCOR-P.

Anesthetized and mechanically ventilated animals were exposed to CO at 2000 ppm CO in air for 45 minutes. During treatment all the animals underwent extracorporeal circulation and were treated by breathing air while the CO photo-remover was provided with: 1) neither gas flow or light (controls), 2) only gas flow (ECCOR), 3) gas flow plus green and blue light (ECCOR-P-Green/Blue) or 4) gas flow plus red light (ECCOR-P-Red). No significant difference in MAP or HR was found among groups at baseline, during CO poisoning or during treatment. Data represent mean \pm SEM. Analyses were performed using two-way ANOVA.

Data file S1. Raw data (provided as separate Excel file).