

- SUPPORTING INFORMATION -

**Differentiating Sepsis from Non-Infectious Systemic Inflammation based on
Microvesicle-Bacteria Aggregation**

*Inge K. Herrmann, Sergio Bertazzo, David J. P. O'Callaghan, Andrea A. Schlegel, Charalam-
bos Kallepitis, David B. Antcliffe, Anthony C. Gordon, Molly M. Stevens**

***Corresponding Author**

Prof. Molly M. Stevens

Department of Materials, Department of Bioengineering and Institute of Biomedical Engineer-
ing,

Imperial College London,

Prince Consort Road,

London SW7 2AZ, UK

m.stevens@imperial.ac.uk

Figure S1:

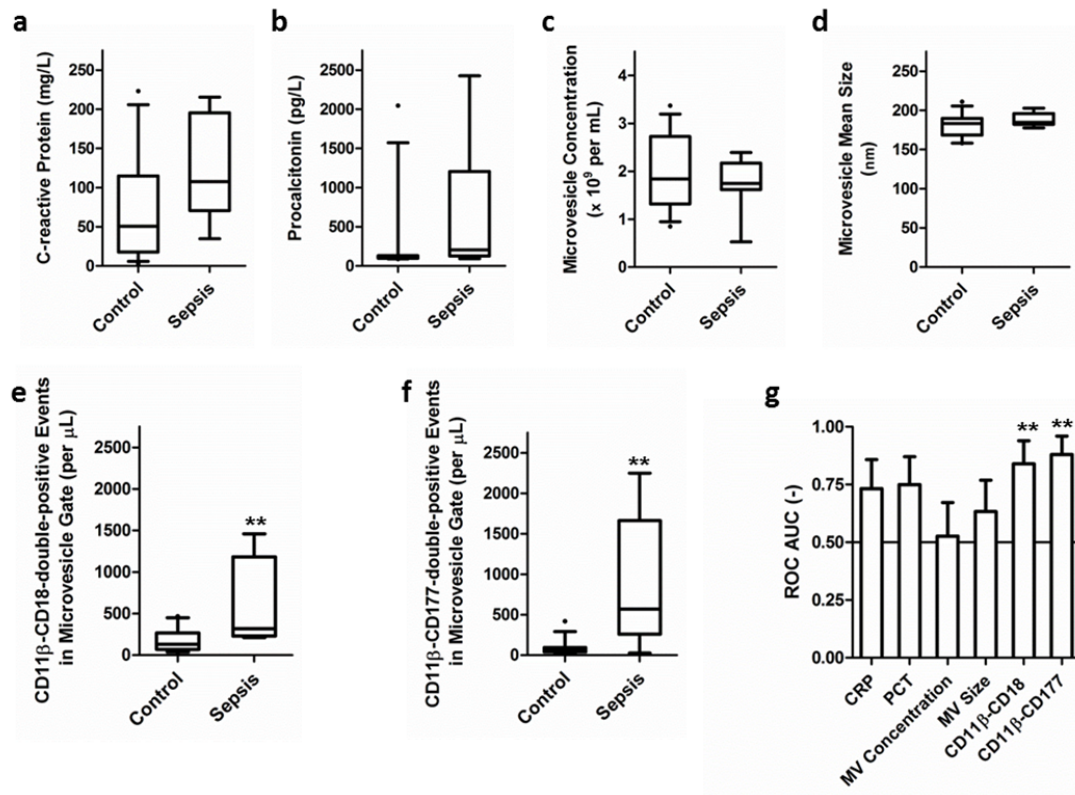


Figure S1. Markers of Inflammation and Microvesicle Characteristics in Patient Plasma Samples. Concentrations for the clinically used sepsis biomarker C-reactive protein (CRP, **a**) and Procalcitonin (PCT, **b**) in the sepsis (n = 8) and control group (n = 14). Microvesicle plasma concentration measured by NTA (**c**) and mean size (**d**) in control group and sepsis patients (after ultracentrifugation). Number concentration of CD11 β /CD177-double positive microvesicles and CD11 β /CD18-double positive microvesicles in patient plasma samples analysed by flow cytometry (**e**,**f**). Receiver Operating Characteristic (ROC) analyses for CRP, PCT, microvesicle concentration and size, and CD11 β /CD177 and CD11 β /CD18-double positive microvesicles (**g**).

Figure S2

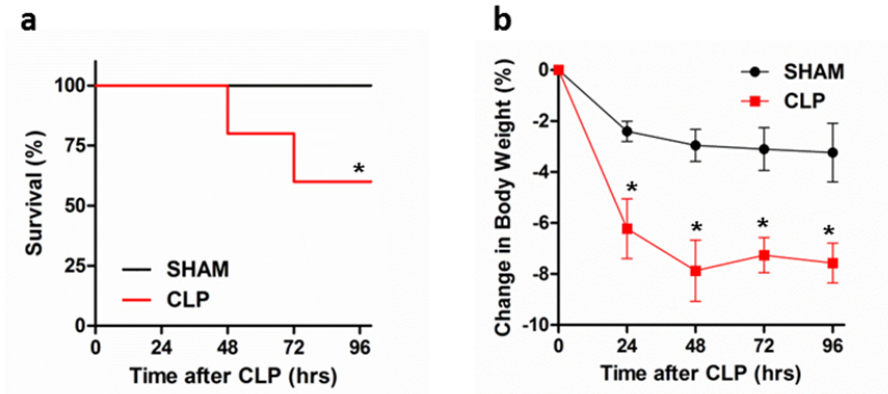


Figure S2. Experimental Sepsis Model. Kaplan-Meier survival curve for SHAM and CLP animals (a) and relative change in body weight (b).

Table S1: Patient Characteristics.

	Primary Investigation Cohort		Validation Cohort	
	Non-sepsis control group (N=14)	Sepsis group (N=8)	Non-sepsis control group (N=6)	Sepsis group (N=6)
Gender				
Male	43%	50%	67%	67%
Female	57%	50%	33%	33%
Age				
Mean +/- SD	60 ± 11	63 ± 12	58 ± 11	68 ± 16
Median (Range)	60.5 (18.25)	62.5 (18)	57.5 (17.5)	69.5 (15.75)
Localisation of infection				
Pulmonal	n.a.	62.50%	n.a.	83%
Abdominal	n.a.	37.50%	n.a.	17%
Diagnosis				
Stroke	21.5%	0	16.3%	0
Brain hemorrhage	57.5%	50%	50%	16.5%
Seizures	7.0%	0	0	0
Neurodegenerative disease	7.0%	0	16.3%	0
Gastrointestinal bleed	0	0	16.3%	0
Cardiac arrest	7.0%	0	0	0
Pneumonia	0	25%	0	67%
Sepsis	0	25%	0	16.5%
Microbiology				
Gram-positive	n.a.	37.50%	n.a.	0
Gram-negative	n.a.	37.50%	n.a.	33%
Undocumented	n.a.	25%	n.a.	67%
Number of SIRS criteria				
Mean +/- SD	2.2 ± 0.8	3.3 ± 1.2	2.2 ± 0.4	3 ± 0.75
Median (Range)	2 (0.75)	4 (1.25)	2 (0)	3 (1)
APACHE II SCORE				
Mean +/- SD	19.5 ± 6.7	22.4 ± 8.4	20.3 ± 5.7	21 ± 3
Median (Range)	19.5 (6.75)	21.5 (4.25)	18.5 (4)	21 (2.25)
Medication				
Vasopressors	71%	62.5%	50%	50%
Other parameters				
White blood cell count in millions, ± SD	11.8 ± 5.9	16.1 ± 6	8 ± 5	14.5 ± 2
T _{min} (°C), ± SD	35.8 ± 1.9	36.3 ± 0.8	35.5 ± 0.8	36.4 ± 1.7
T _{max} (°C), ± SD	37.6 ± 1.1	38.2 ± 1	38 ± 0.7	37 ± 1.2
Heart rate (bpm), ± SD	82 ± 20	113 ± 34	87 ± 14	121 ± 40
Outcome				
Mortality (%)	14%	50%	33%	66%

Table S2: Patient Inclusion/Exclusion Criteria.

Inclusion Criteria	<ul style="list-style-type: none">• Adults (> 16 years)• Intubated and ventilated within the previous 48 hours• Expected to be ventilated for > 48 hours• Fulfill 2/4 systemic inflammatory response syndrome (SIRS) criteria:<ul style="list-style-type: none">▪ temp < 36 or > 38;▪ heart rate > 90 bpm;▪ respiratory rate > 20 or paCO₂ < 4.3 or need for mechanical ventilation;▪ leukocyte count > 12,000 cells/mm³ < 4000 cells/mm³ or > 10% band forms
Exclusion Criteria	<ul style="list-style-type: none">• Immunosuppression• Use of granulocyte colony stimulating factor