

# Impact of Dialysis Clinical Operating Conditions on Human Serum Protein-mediated Inflammatory Biomarkers Released in Patients Using Polyarylethersulfone Membranes

Heloisa Westphalen<sup>1</sup>, Shaghayegh Saadati<sup>1,2</sup>, Jumanah Bahig<sup>2,3</sup>, Huu Doan<sup>4</sup>, Ahmed Shoker<sup>5,6</sup>, Amira Abdelrasoul<sup>1,2\*</sup>

<sup>1</sup>Department of Chemical and Biological Engineering, University of Saskatchewan, 57 Campus Drive, Saskatoon, Saskatchewan, S7N 5A9, Canada

<sup>2</sup>Division of Biomedical Engineering, University of Saskatchewan, 57 Campus Drive, Saskatoon, Saskatchewan, S7N 5A9, Canada

<sup>3</sup>Kinesiology, University of Saskatchewan, 87 Campus Dr, Saskatoon, Saskatchewan, S7N 5B, Canada.

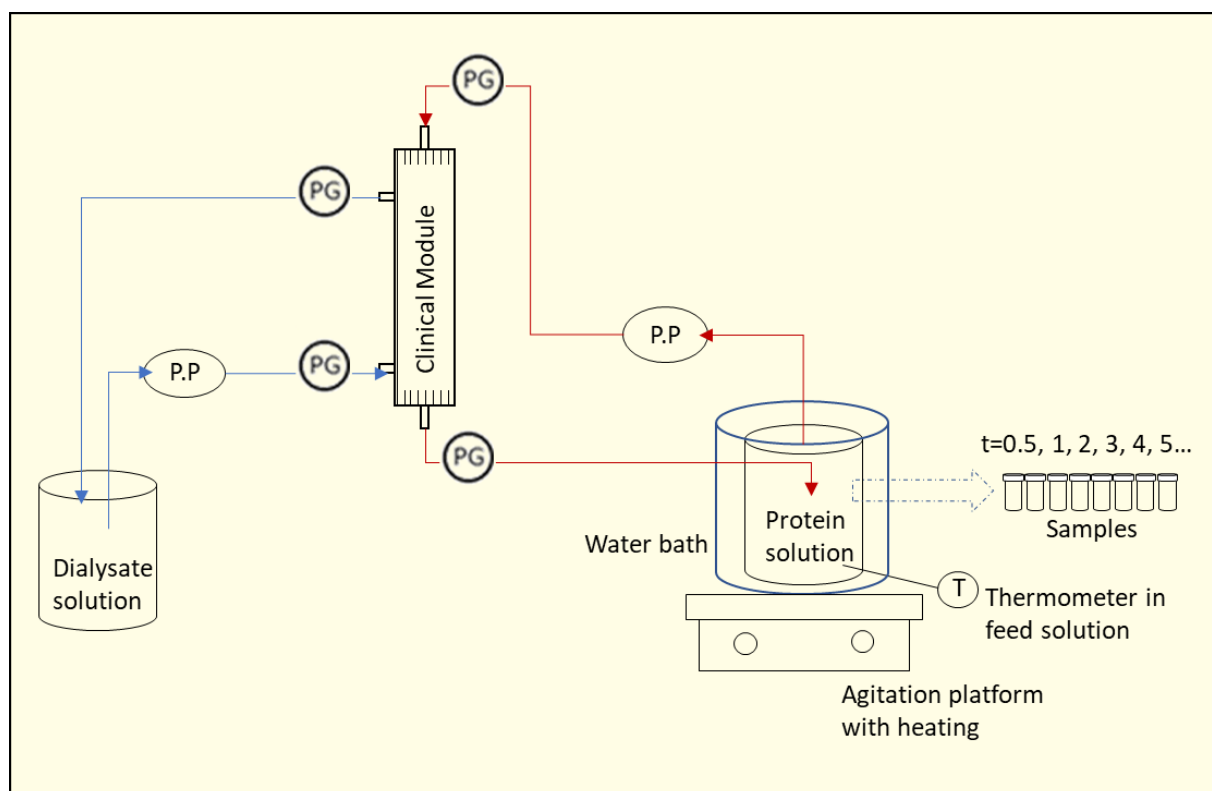
<sup>4</sup>Department of Chemical Engineering, Toronto Metropolitan University, 350 Victoria St., Toronto, ON M5B 2K3, Canada

<sup>5</sup>Nephrology Division, College of Medicine, University of Saskatchewan, 107 Wiggins Rd, Saskatoon, Saskatchewan, S7N 5E5, Canada

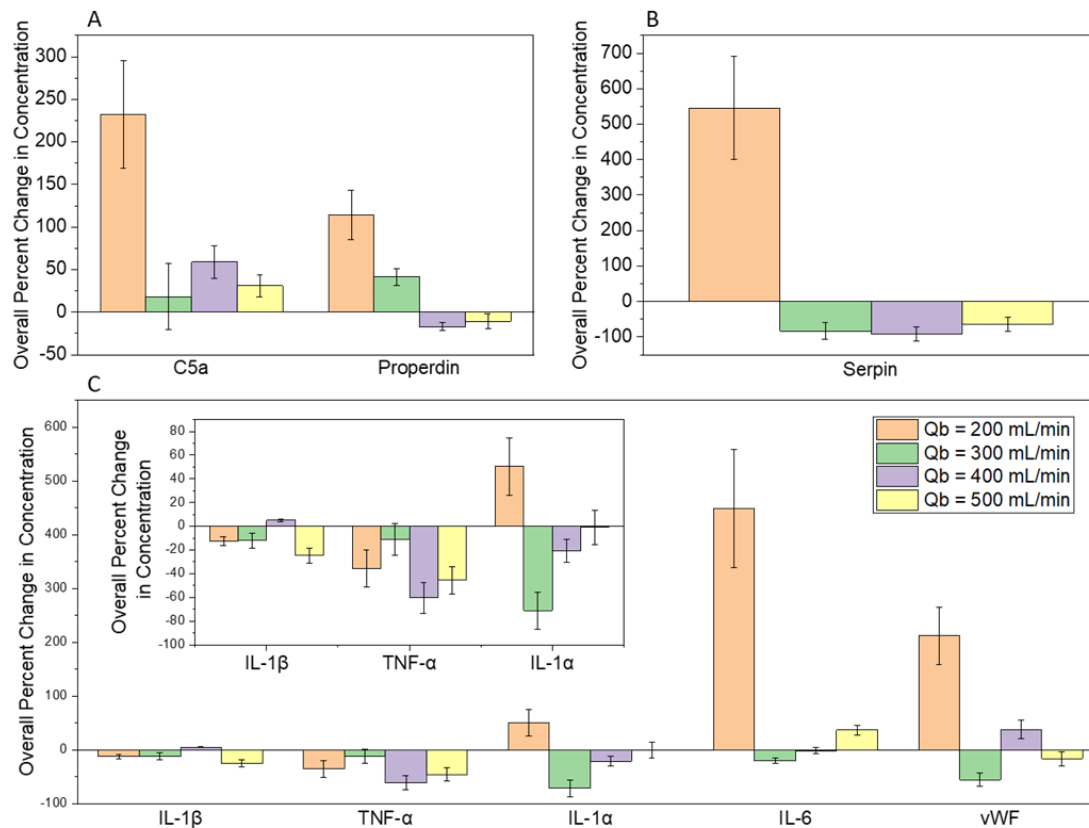
<sup>6</sup>Saskatchewan Transplant Program, St. Paul's Hospital, 1702 20th Street West, Saskatoon, Saskatchewan, S7M 0Z9, Canada

**\*Corresponding Author: amira.abdelrasoul@usask.ca, Tel: (306) 966 2946, Fax: (306) 966 4777**

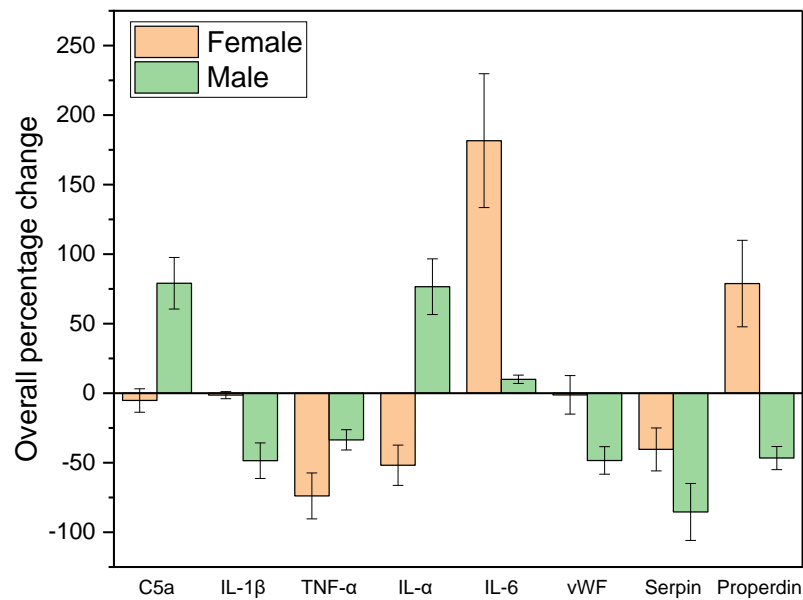
## SUPPORTING INFORMATION



**Figure S1.** Experimental setup for *in-vitro* FB adsorption.



**Figure S2.** Overall percent change in concentration of (A) C5a, properdin; (B) Serpin and (C) TNF- $\alpha$ , IL-1 $\alpha$ , IL-1 $\beta$ , IL-6, and vWF in patients treated with different values of Qb (Qd=500 mL/min)



**Figure S3.** Overall percent change in concentration of inflammatory biomarkers for female and male patients (Qb=500 mL/min)

**Table S1.** Shapiro-Wilk normality test results

	Statistic	p-value	Decision at level(5%)
C5a	0.91051	0.47068	Can't reject normality
IL-1 $\beta$	0.94231	0.68234	Can't reject normality
TNF- $\alpha$	0.81521	0.10718	Can't reject normality
IL-1 $\alpha$	0.93367	0.62161	Can't reject normality
IL-6	0.90752	0.45285	Can't reject normality
vWF	0.9558	0.77846	Can't reject normality
Serpin	0.81511	0.10699	Can't reject normality
Properdin	0.9506	0.7415	Can't reject normality

**Table S2.** Surface roughness measurements for hollow polymer membrane fibers

Parameters	PAES-PVP	
	Inside (2 $\times$ 2 $\mu$ m) (n=3)	Outside (1.5 $\times$ 1.5 $\mu$ m) (n=4)
Membrane average roughness; $R_a$ (nm)	10.4 $\pm$ 4.0	10.5 $\pm$ 5.0
Membrane root mean square roughness; $R_{RMS}$ (nm)	15.3 $\pm$ 5.9	15.4 $\pm$ 6.8