Electronic Supplementary Information

Electric Impedance Microflow Cytometry for Disease-State Characterization and Diagnostics†

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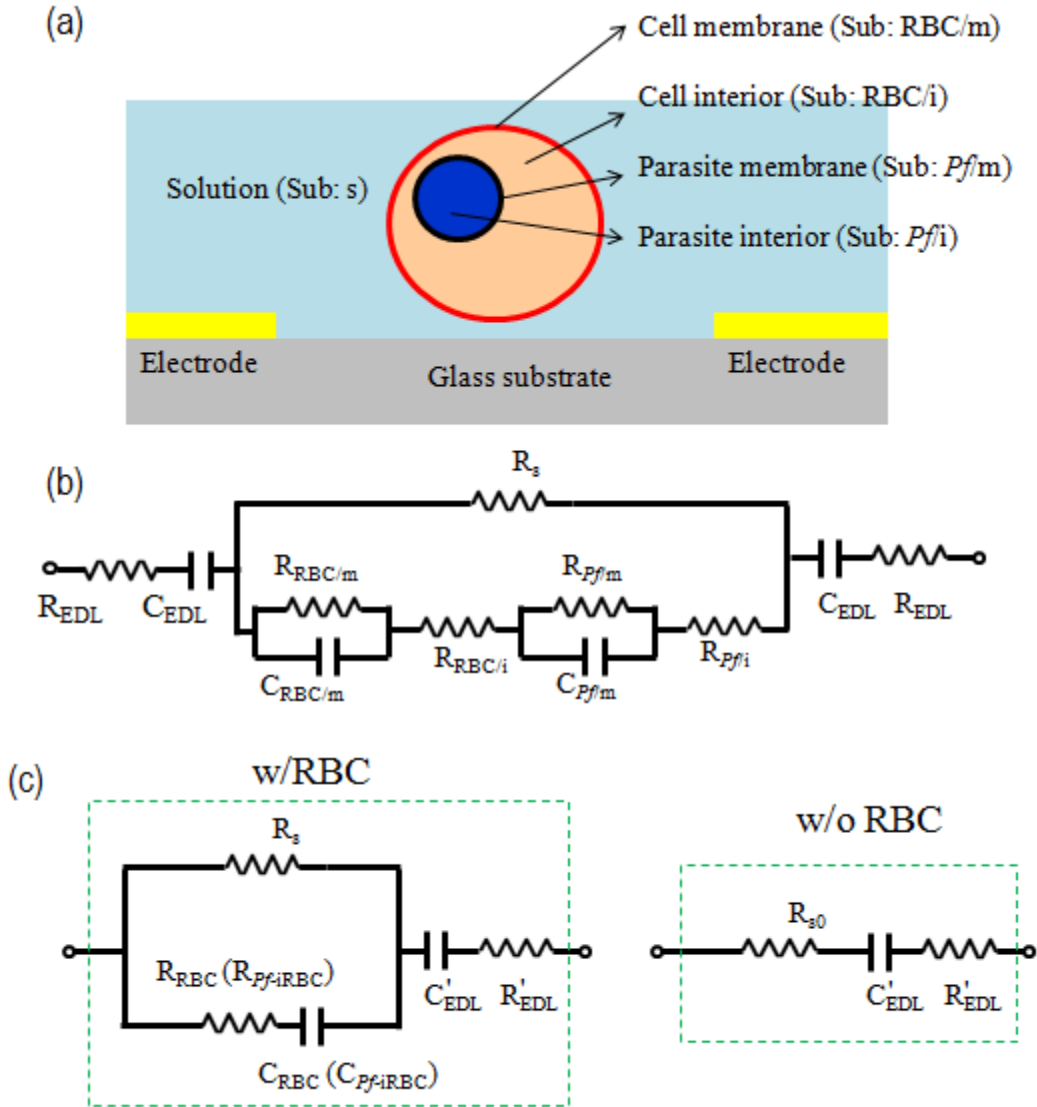
Supplementary Figures

Fig.S1 (a) Schematic of a *Pf*-iRBC suspended in solution between two electrodes. **(b)** Equivalent complete circuit model of single *Pf*-iRBC suspended between two electrodes. **(c)** Unitary circuit model of single *Pf*-iRBC suspended between two electrodes (assume the effects of presence of cell on medium resistance change is ignorable: $R_s \approx R_{s0}$).
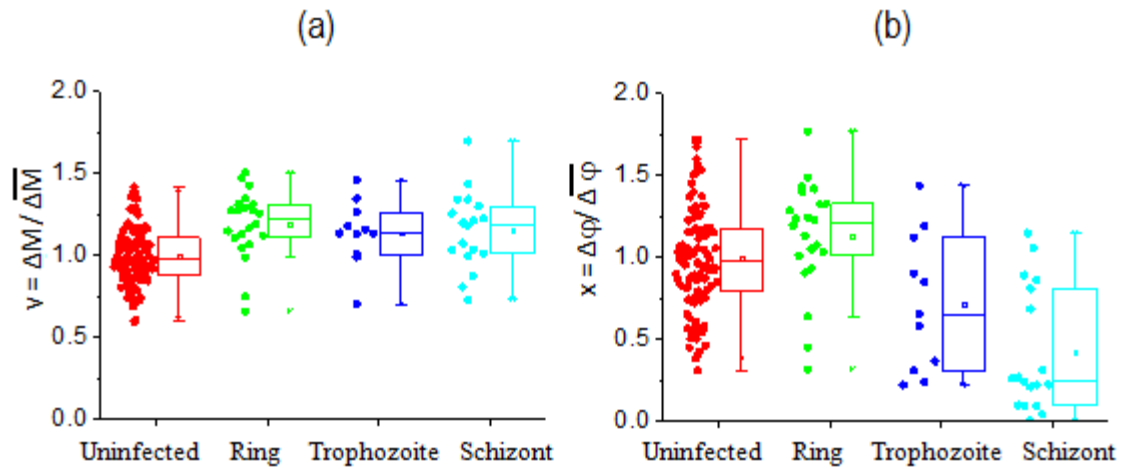
Fig.S2 (a) Scatter plot of normalized magnitude transition for uninfected RBCs and *Pf*-iRBCs in 0.5% w/v BSA-PBS. **(b)** Scatter plot of normalized phase transition for uninfected RBCs and *Pf*-iRBCs in 0.5% w/v BSA-PBS.

Fig.S3 (a) Scatter plot of normalized magnitude transition for uninfected RBCs and *Pf*-iRBCs in 1% w/v BSA-PBS. **(b)** Scatter plot of normalized phase transition for uninfected RBCs and *Pf*-iRBCs in 1% w/v BSA-PBS.
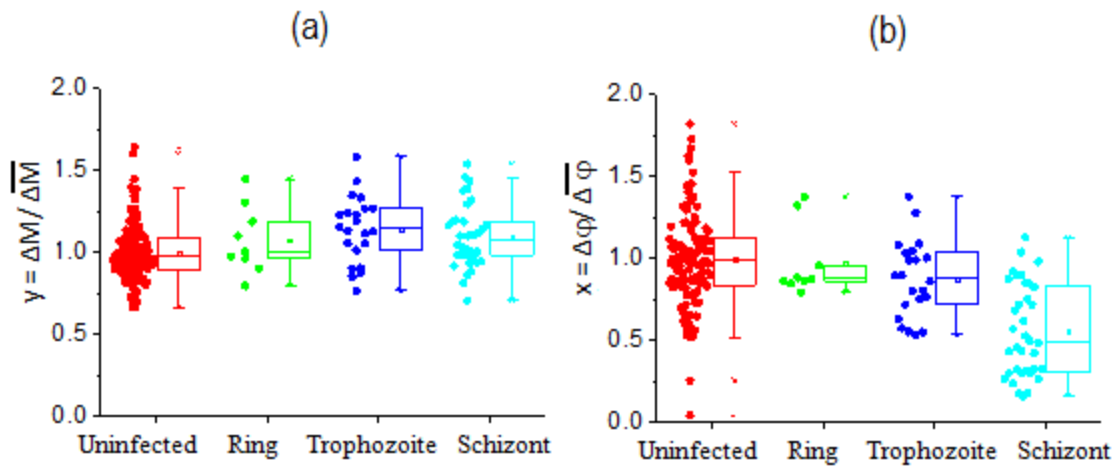
Supplementary Tables

Table S1 Descriptive statistics of EI transitions of individual cells for different BSA concentrations (N: uninfected RBCs; R: ring stage; T: trophozoite stage; S: schizont stage).

Condition	0.2 % w/v BSA-PBS			0.5% w/v BSA-PBS			1 % w/v BSA-PBS		
EI transition	Population (count)	Mean	S.D.	Population (count)	Mean	S.D.	Population (count)	Mean	S.D.
Mag (Ω)	N (120)	379.92	43.48	N (120)	385.27	81.15	N (120)	458.58	133.75
Pha (rad)		-0.13	0.03		-0.12	0.03		-0.24	0.13
Mag (Ω)	R (9)	433.33	43.19	R (22)	450.87	78.05	R (15)	660.40	126.70
Pha (rad)		-0.14	0.03		-0.12	0.03		-0.25	0.06
Mag (Ω)	T (22)	459.34	65.10	T (13)	451.36	84.38	T (16)	684.38	121.56
Pha (rad)		-0.13	0.05		-0.09	0.03		-0.21	0.07
Mag (Ω)	S (36)	505.22	92.98	S (26)	403.48	113.91	S (11)	408.69	68.19
Pha (rad)		-0.11	0.07		-0.05	0.02		-0.13	0.14

Table S2 Statistical significance of detection parameters for uninfected RBCs and *Pf*-iRBCs in 0.2% w/v BSA-PBS (N: uninfected RBCs; R: ring stage; T: trophozoite stage; S: schizont stage).

Offset δ				Normalized magnitude transition Y				Normalized phase transition X			
P-value	R	T	S	P-value	R	T	S	P-value	R	T	S
N	1.27E-07	1.08E-08	5.09E-06	N	2.79E-04	1.94E-04	1.17E-03	N	4.13E-01	9.12E-01	5.00E-01
R		5.88E-04	1.09E-04	R		1.99E-01	3.29E-02	R		5.44E-01	3.35E-01
T			4.63E-03	T			1.76E-01	T			5.90E-01

Table S3 Statistical significance of detection parameters for uninfected RBCs and *Pf*-iRBCs in 0.5% w/v BSA-PBS. (N: uninfected RBCs; R: ring stage; T: trophozoite stage; S: schizont stage).

Offset δ				Normalized magnitude transition Y				Normalized phase transition X			
P-value	R	T	S	P-value	R	T	S	P-value	R	T	S
N	1.25E-07	1.21E-04	1.60E-06	N	4.43E-04	4.65E-02	1.64E-04	N	1.06E-01	5.21E-02	3.71E-06
R		1.17E-02	1.20E-04	R		5.08E-01	6.30E-01	R		1.11E-02	4.10E-07
T			4.94E-02	T			8.50E-01	T			6.71E-02

Table S4 Statistical significance of detection parameters for uninfected RBCs and *Pf*-iRBCs in 1% w/v BSA-PBS. (N: uninfected RBCs; R: ring stage; T: trophozoite stage; S: schizont stage).

Offset δ				Normalized magnitude transition Y				Normalized phase transition X			
P-value	R	T	S	P-value	R	T	S	P-value	R	T	S
N	1.34E-01	3.17E-07	1.36E-08	N	3.06E-01	4.93E-03	8.96E-03	N	7.58E-01	3.46E-02	2.42E-11
R		9.22E-02	7.85E-03	R		4.41E-01	7.99E-01	R		2.67E-01	1.87E-04
T			7.12E-02	T			4.09E-01	T			2.38E-05