

Experiment to Monitor Cell Growth Status Using the INNOMET™ Counter

INTRODUCTION

INNOMET™ COUNTER is a fully automated, high-throughput, desktop-sized device based on the Trypan Blue staining method. Equipped with a large-field camera, imported objective lenses, and an intelligent AJ algorithm, it accurately identifies and counts various types of cells. It is widely used in biological laboratories, pharmaceutical research and development, and other related fields.

Materials and Methods

1. Sample Preparation

Samples of the cell suspension are prepped by dilution and staining on counting slides, followed by counting on the INNOMET™ counter.

2. Reagents

Brand Catalog Number	Brand Catalog Number	Brand Catalog Number
0.12% Trypan Blue N/AN/A	0.12% Trypan Blue N/AN/A	0.12% Trypan Blue N/AN/A

3. Consumables

Brand Catalog Number	Brand Catalog Number	Brand Catalog Number
Counting Slide VELSSON N/A	Counting Slide VELSSON N/A	Counting Slide VELSSON N/A

4. Equipment

Brand Model	Brand Model	Brand Model
Cell Counter VELSSON N/A	Cell Counter VELSSON N/A	Cell Counter VELSSON N/A

Experimental Procedure

1. Sample Collection

In a sterile environment, aseptically collect the required cell suspension volume for counting.

2. Steps

2.1 Dilution

Add the cell suspension to the designated well on the counting slide.

Dilute with 1X PBS or cell culture medium until the total volume is 100 µL. Mix gently with a pipette.

2.2 Staining

Add 50 µL of 0.12% Trypan Blue to the cell suspension and mix gently.

Transfer 50 µL of the stained cell suspension to the designated counting well.

2.3 Counting

Open the INNOMET COUNTER software, click "Open," place the prepared counting slide on the tray, and click "Load."

Start a new experiment, entering cell type, experiment name, and selecting a 1.5X dilution factor.

Proceed to the next step, selecting the sample well position to start counting.

Results

1. High Viability Results (67% - 100%)

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	87.94	1.39E+07	78.8375	5.28E+06	77.2125	1.19E+06	76.9375	6.50E+05	75.6125	1.20E+05
Replicate 2	87.6	1.39E+07	79.2275	5.29E+06	76.475	1.18E+06	76.96	6.50E+05	76.1425	1.20E+05
Replicate 3	87.38	1.39E+07	79.22	5.27E+06	76.335	1.18E+06	76.5725	6.50E+05	74.1225	1.18E+05
Replicate 4	87.54	1.39E+07	79.24	5.23E+06	76.5125	1.18E+06	76.4625	6.53E+05	73.0625	1.16E+05
Replicate 5	87.31	1.39E+07	79.2675	5.22E+06	76.2225	1.18E+06	75.3225	6.56E+05	73.0725	1.18E+05
Replicate 6	87.74	1.39E+07	79.1225	5.21E+06	76.0925	1.17E+06	75.05	6.53E+05	71.9175	1.16E+05
Replicate 7	87.52	1.38E+07	79.645	5.19E+06	76.0075	1.17E+06	75.1975	6.58E+05	71.77	1.18E+05
Replicate 8	89.09	1.46E+07	79.4425	5.18E+06	75.755	1.17E+06	74.76	6.53E+05	70.235	1.17E+05
Replicate 9	89.18	1.46E+07	79.1225	5.17E+06	75.6525	1.17E+06	74.3375	6.57E+05	70.105	1.16E+05
Replicate 10	87.52	1.38E+07	78.945	5.19E+06	75.29	1.18E+06	74.7175	6.48E+05	68.025	1.14E+05
Mean	87.882	1.40E+07	79.207	5.22E+06	76.1555	1.18E+06	75.63175	6.53E+05	72.4065	1.17E+05
Standard Deviation	0.683565814	308400.8935	0.229031172	45089.67302	0.534567322	8072.093372	0.99654476	3382.009503	2.536594173	1630.549419
Coefficient of Variation	0.78%	2.20%	0.29%	0.86%	0.70%	0.69%	1.32%	0.52%	3.50%	1.39%

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	87.17	1.24E+07	79.12	5.17E+06	75.29	1.18E+06	74.72	6.48E+05	68.03	1.14E+05
Replicate 2	87.98	1.23E+07	78.95	5.19E+06	75.56	1.17E+06	74.38	6.51E+05	69.57	1.14E+05
Replicate 3	87.96	1.23E+07	79.12	5.16E+06	75.3	1.17E+06	73.78	6.48E+05	67.78	1.14E+05
Replicate 4	87.96	1.23E+07	78.84	5.15E+06	75.05	1.17E+06	73.54	6.53E+05	67.6	1.17E+05
Replicate 5	88.02	1.24E+07	78.85	5.14E+06	75.03	1.16E+06	73.46	6.49E+05	63.43	1.14E+05
Replicate 6	88.06	1.24E+07	78.62	5.14E+06	75.53	1.17E+06	72.75	6.50E+05	63.75	1.14E+05
Replicate 7	88.06	1.24E+07	78.56	5.12E+06	75.22	1.17E+06	72.83	6.47E+05	63.86	1.15E+05
Replicate 8	88.2	1.24E+07	78.53	5.12E+06	75.29	1.17E+06	72.26	6.46E+05	63.51	1.12E+05
Replicate 9	88.18	1.24E+07	78.18	5.09E+06	75	1.17E+06	72.36	6.45E+05	59.99	1.13E+05
Replicate 10	88.21	1.25E+07	78.82	5.17E+06	75.45	1.17E+06	73.42	6.48E+05	66.23	1.17E+05
Mean	87.98	1.24E+07	78.759	5.15E+06	75.272	1.17E+06	73.35	6.49E+05	65.375	1.14E+05
Standard Deviation	0.28506 1397	60000	0.27609 5998	28017.8 5145	0.19161 4196	4472.13 5955	0.7729 4243	2247.22 0505	2.7804 3252	1496.66 2955
Coefficient of Variation	0.32%	0.48%	0.35%	0.54%	0.25%	0.38%	1.05%	0.35%	4.25%	1.31%

2. Medium Viability Results (34% - 66%)

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	43.5	4.31E+06	47.11	4.82E+06	47.42	1.14E+06	45.68	5.41E+05	33.51	1.21E+05
Replicate 2	43.46	4.30E+06	47.15	4.87E+06	47.64	1.13E+06	46.58	5.49E+05	36.53	1.27E+05
Replicate 3	43.24	4.30E+06	47.08	4.82E+06	47.08	1.14E+06	45.27	5.45E+05	34.2	1.22E+05
Replicate 4	43.56	4.30E+06	46.75	4.82E+06	46.6	1.13E+06	44.9	5.44E+05	32.62	1.20E+05
Replicate 5	43.35	4.30E+06	47.14	4.83E+06	47.03	1.13E+06	44.71	5.44E+05	33.44	1.20E+05
Replicate 6	43.48	4.30E+06	47.79	4.73E+06	46.15	1.11E+06	42.93	5.30E+05	30.25	1.22E+05
Replicate 7	43.27	4.29E+06	47.08	4.82E+06	47.29	1.13E+06	45.17	5.39E+05	32.71	1.20E+05
Replicate 8	43.12	4.29E+06	47.12	4.90E+06	47.04	1.13E+06	45.71	5.51E+05	37.66	1.28E+05
Replicate 9	43.03	4.29E+06	46.98	4.80E+06	46.71	1.13E+06	44.69	5.41E+05	32.88	1.20E+05
Replicate 10	43.07	4.29E+06	46.93	4.80E+06	46.7	1.13E+06	44.55	5.41E+05	30.99	1.18E+05
Mean	43.308	4.30E+06	47.113	4.82E+06	46.966	1.13E+06	45.019	5.43E+05	33.479	1.22E+05
Standard Deviation	0.191531837	6749.485577	0.267832867	44584.50154	0.437675679	8164.965809	0.95677061	5778.311941	2.251451137	3224.903099
Coefficient of Variation	0.44%	0.16%	0.57%	0.92%	0.93%	0.72%	2.13%	1.07%	6.72%	2.65%

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	43.5	4.31E+06	47.11	4.82E+06	42.53	1.07E+06	45.68	5.41E+05	33.51	1.21E+05
Replicate 2	43.26	4.29E+06	47.51	4.94E+06	42.53	1.07E+06	48.84	5.49E+05	36.8	1.21E+05
Replicate 3	43.15	4.28E+06	46.99	4.88E+06	42.86	1.07E+06	46.3	5.54E+05	35.77	1.27E+05
Replicate 4	43.07	4.29E+06	47.2	4.87E+06	42.41	1.07E+06	45.91	5.48E+05	36.89	1.29E+05
Replicate 5	42.93	4.27E+06	46.47	4.87E+06	42.28	1.07E+06	46.36	5.50E+05	35.93	1.27E+05
Replicate 6	42.92	4.26E+06	46.57	4.87E+06	42.21	1.06E+06	46.22	5.53E+05	33.96	1.25E+05
Replicate 7	42.91	4.29E+06	46.49	4.79E+06	42.01	1.06E+06	44.16	5.32E+05	28.61	1.17E+05
Replicate 8	42.62	4.27E+06	46.73	4.87E+06	41.94	1.06E+06	45.39	5.46E+05	33.88	1.27E+05
Replicate 9	42.7	4.26E+06	46.59	4.86E+06	42.11	1.04E+06	45.38	5.49E+05	33.14	1.25E+05
Replicate 10	42.81	4.27E+06	46.33	4.86E+06	39.67	1.06E+06	45.68	5.47E+05	33.57	1.27E+05
Mean	42.987	4.28E+06	46.799	4.86E+06	41.96	1.06E+06	45.992	5.47E+05	34.206	1.25E+05
Standard Deviation	0.251636643	15132.74595	0.363880475	36891.73349	0.837535345	9000	1.126408452	6040.695324	2.299091995	3555.277767
Coefficient of Variation	0.59%	0.35%	0.78%	0.76%	2.00%	0.85%	2.45%	1.10%	6.72%	2.85%

3. Low Viability Results (0% - 33%)

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	3.79	1.14E+07	5.5	5.59E+06	7.97	1.31E+06	5.37	5.77E+05	10.6	1.09E+05
Replicate 2	3.75	1.14E+07	5.31	5.58E+06	7.89	1.31E+06	4.88	5.77E+05	10.34	1.06E+05
Replicate 3	3.67	1.14E+07	5.3	5.59E+06	7.91	1.31E+06	5.26	5.73E+05	11.9	1.09E+05
Replicate 4	3.6	1.14E+07	5.15	5.57E+06	7.74	1.30E+06	4.73	5.66E+05	10.95	1.05E+05
Replicate 5	3.53	1.14E+07	5.16	5.57E+06	7.65	1.30E+06	4.7	5.66E+05	8.38	1.04E+05
Replicate 6	3.56	1.14E+07	5.01	5.57E+06	7.47	1.30E+06	4.55	4.69E+05	9.1	1.00E+05
Replicate 7	3.47	1.14E+07	5.19	5.58E+06	7.5	1.30E+06	4.31	5.66E+05	11.66	1.10E+05
Replicate 8	3.41	1.14E+07	5.01	5.57E+06	7.57	1.30E+06	4.54	5.61E+05	11.14	1.07E+05
Replicate 9	3.35	1.14E+07	4.95	5.56E+06	7.55	1.30E+06	4.2	5.61E+05	9.77	1.04E+05
Replicate 10	3.35	1.14E+07	4.81	5.56E+06	7.34	1.30E+06	4.29	5.60E+05	9.4	1.06E+05
Mean	3.548	1.14E+07	5.139	5.57E+06	7.659	1.30E+06	4.683	5.58E+05	10.324	1.06E+05
Standard Deviation	0.156687942	0	0.201629473	10749.677	0.211421117	4830.458915	0.3959812	31763.71095	1.147017388	2981.42397
Coefficient of Variation	4.42%	0.00%	3.92%	0.19%	2.76%	0.37%	8.46%	5.70%	11.11%	2.81%

Sample	Approximately 1E7		Approximately 5E6		Approximately 1E6		Approximately 5E5		Approximately 1E5	
	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)	Viability (%)	Concentration (cells/mL)
Replicate 1	3.94	1.14E+07	5.42	5.58E+06	8.56	1.30E+06	5.29	5.74E+05	11.38	1.06E+05
Replicate 2	3.29	1.14E+07	4.76	5.55E+06	7.1	1.30E+06	4.12	5.62E+05	9.69	1.07E+05
Replicate 3	4.49	1.13E+07	6.21	5.55E+06	10.5	1.30E+06	8.18	5.68E+05	11.03	1.01E+05
Replicate 4	5.28	1.14E+07	6.61	5.57E+06	10.32	1.31E+06	7.16	5.71E+05	13.94	1.06E+05
Replicate 5	4.98	1.14E+07	6.25	5.58E+06	10.11	1.30E+06	6.68	5.75E+05	12.77	1.05E+05
Replicate 6	4.65	1.14E+07	6.07	5.58E+06	9.76	1.30E+06	5.84	5.71E+05	11.31	1.05E+05
Replicate 7	4.49	1.14E+07	5.95	5.58E+06	9.49	1.30E+06	5.4	5.71E+05	10.44	1.01E+05
Replicate 8	3.46	1.12E+07	5.15	5.53E+06	9.19	1.30E+06	5.19	5.70E+05	11.54	1.03E+05
Replicate 9	4.11	1.14E+07	5.58	5.58E+06	9.05	1.30E+06	5.57	5.75E+05	11.91	1.05E+05
Replicate 10	3.97	1.14E+07	5.69	5.57E+06	8.78	1.31E+06	5.12	5.78E+05	11.05	1.08E+05
Mean	4.266	1.14E+07	5.769	5.57E+06	9.286	1.30E+06	5.855	5.72E+05	11.506	1.05E+05
Standard Deviation	0.600519775	64031.24237	0.531176995	16763.05461	0.954716712	4000	1.113088047	4224.926035	1.122917628	2238.302929
Coefficient of Variation	14.08%	0.56%	9.21%	0.30%	10.28%	0.31%	19.01%	0.74%	9.76%	2.14%

CONCLUSIONS

- 1.Counting with the INNOMET™ COUNTER provides accurate results.
- 2.The INNOMET™ COUNTER demonstrates high consistency in repeated measurements.