



A Highly Consistent Lowry Method on Biomek i-Series

Summary

- Lowry method automated on Biomek i-Series provides high consistency between replicates.
- Based on the desired throughput and walkaway, Lowry method can be implemented on Biomek i5 Span-8, Biomek i5 Multichannel and Biomek i7 hybrid with Spectramax® i3 (Molecular devices).

The Lowry method has been widely used for protein quantification for many years. The quantification is based on peptide bonds of proteins reacting with copper under alkaline conditions followed by copper-catalyzed oxidation of aromatic amino acids, producing blue color. The intensity of the blue color is measured at 750 nm and it is proportional to the protein quantity. The repetitive pipetting and incubation steps in the Lowry method makes it extremely hands-on and time consuming, when done manually (**Figure 1**). Therefore, we automated the Lowry method on Biomek i-Series (**Figure 2**).

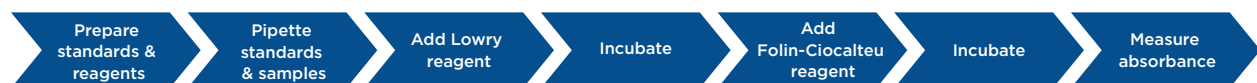


Figure 1. The workflow of Lowry method

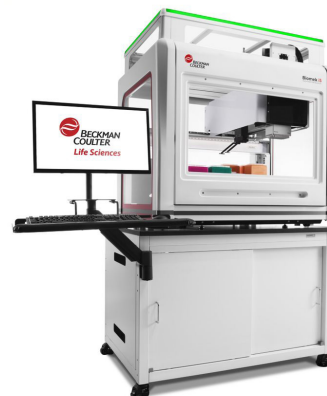
Biomek i5 Span-8

- Ideal for medium- to high-throughput workflows
- Span-8 with 0.5- 5,000 μL pipetting capability
- Independent 360 degree rotating gripper with offset fingers for efficient and reliable labware movement
- 25 positions for increased walk away time
- Active ALPs for controlling sample processing – Orbital shakers, peltiers and tip wash



Biomek i5 Multichannel

- Ideal for medium- to high-throughput workflows
- Multichannel head in 96 or 384 format
- Independent 360 degree rotating gripper with offset fingers for efficient and reliable labware movement
- 25 positions for increased walk away time
- Active ALPs for controlling sample processing – Orbital shakers, peltiers and tip wash



Biomek i7 hybrid with integrations

- Ideal for high-throughput workflows
- 300 μ L or 1,200 μ L Multichannel head with 1-300 μ L and 1-1,200 μ L pipetting capability
- Span-8 pod with fixed and disposable tips
- Enhanced Selective Tip pipetting to transfer custom array of samples
- Independent 360 degree rotating gripper
- High deck capacity with 45 positions
- Orbital Shakers, peltiers span-8 and 96 channel Tip washing for controlling sample processing
- Integrated Spectramax® i3 (Molecular devices) to increase walkaway



Figure 2. Biomek i5 Span-8, Biomek i5 Multichannel and Biomek i7 hybrid with Spectramax® i3 (Molecular devices)

We purchased the modified Lowry Protein assay kit (Thermo Scientific) with BSA standards. The method was automated separately on Biomek i5 Span-8, Biomek i5 Multichannel and Biomek i7 hybrid with Spectramax® i3 (Molecular devices).

Figures 3-5, shows the low CVs of the standards, indicating consistent sample preparation across triplicate wells (CV < 2%). Compared to manual processing, automation require less preparation time, as the Biomek carry out reagent preparation on-deck.

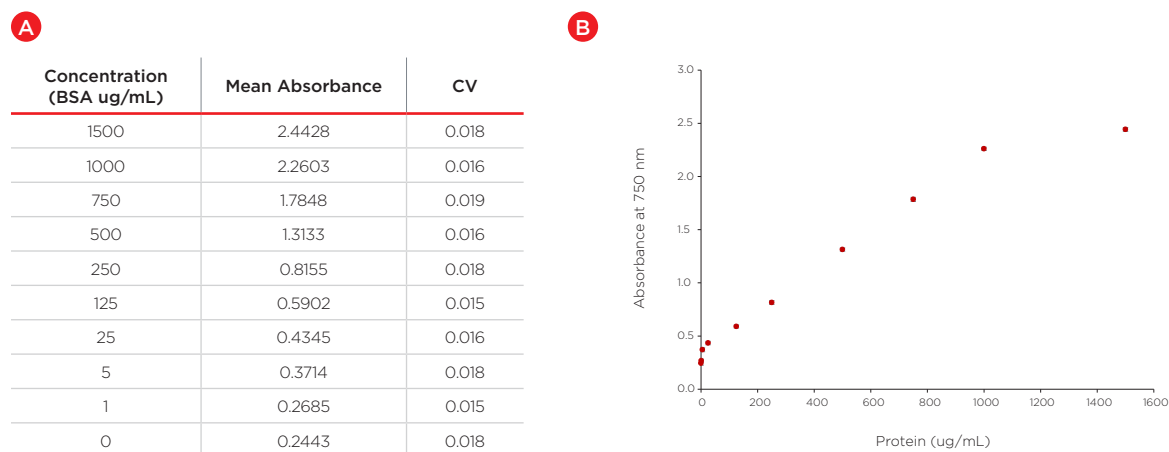


Figure 3 (A). Triplicate average absorbance and variability for BSA standards.
(B) Standard curve corresponding to Biomek i5 Span-8 automated Lowry assay (Error bars represent CV).

A

Concentration (BSA ug/mL)	Mean Absorbance	CV
1500	2.6407	0.017
1000	2.4023	0.017
750	1.9701	0.014
500	1.4496	0.017
250	0.9401	0.018
125	0.6914	0.017
25	0.5242	0.019
5	0.4436	0.019
1	0.3945	0.019
0	0.2942	0.018

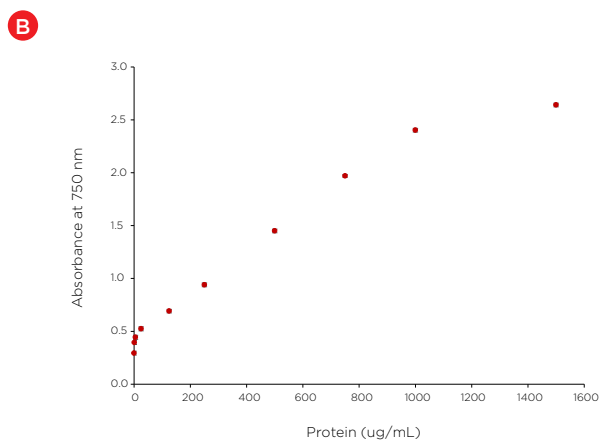


Figure 4 (A). Triplicate average absorbance and variability for BSA standards. **(B)** Standard curve corresponding to Biomek i5 Multichannel automated Lowry assay (Error bars represent CV).

A

Concentration (BSA ug/mL)	Mean Absorbance	CV
1500	2.3847	0.017
1000	2.2036	0.018
750	1.9668	0.017
500	1.5722	0.019
250	0.9072	0.018
125	0.6575	0.018
25	0.4787	0.019
5	0.4585	0.018
1	0.3926	0.017
0	0.2518	0.018

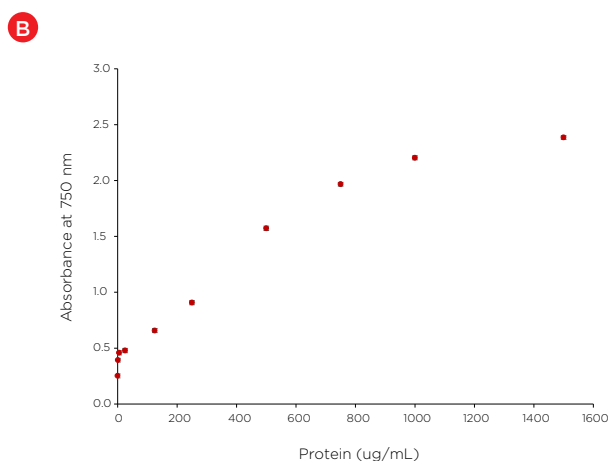


Figure 5 (A). Triplicate average absorbance and variability for BSA standards. **(B)** Standard curve corresponding to Biomek i7 hybrid automated Lowry assay (Error bars represent CV).

Although routine assays such as Lowry method appears simplistic, the repetitive steps such as incubations and pipetting makes them time consuming to carryout manually. Automation helps to minimize the hands of time required for these assays. The Biomek i-Series provides an assay of liquid handlers to suit laboratory throughput and desired walkaway (**Figure 2**). The user has the ability to select the workstation with the required number of touch points, depending on their schedule and throughput. For instance, integrating a reader to the Biomek provide end-to-end workflow automation and complete walkaway. In addition, using automation enables high consistency, especially when the sample throughput is high.

References

1. Lowry, O. H., Rosebrough, N. J., Farr, A. L., and Randall, R. J. (1951) Protein measurement with the Folin phenol reagent. *J. Biol. Chem.* 193, 265-275.
2. Walker, J.M. (2002).*The protein protocol handbook*. Totowa, New Jersey: Humana Press Inc.

Biomek Automated Workstations are not intended or validated for use in the diagnosis of disease or other conditions. Beckman Coulter Life Sciences genomic reagent kits are for research use only.

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