# PRODUCT INFORMATION

## Carbamylation Affinity Sorbent

*Item No. 601931*

### Overview and Properties

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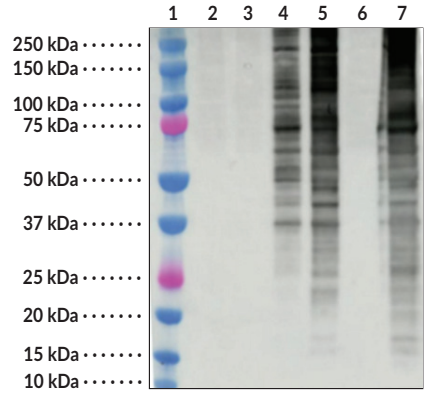
|---|---|
| **Contents:** | This vial contains 400 µl of Sepharose™ coupled to Anti-Carbamylation (Homocitrulline) Monoclonal Antibody (Clone 1C6) (Item No. 23203). |
| **Synonyms:** | pan-Carbamylation, Carbamylation Affinity Beads, Carbamylation Affinity Resins |
| **Cross Reactivity:** | (+) Carbamylated residues/proteins |
| **Species Reactivity:** | Species Independent |
| **Form:** | Liquid |
| **Storage:** | 4°C (as supplied) |
| **Stability:** | ≥2 years |
| **Storage Buffer:** | 50% slurry in PBS, pH 7.2, with 0.02% sodium azide |
| **Host:** | Mouse |
| **Isotype:** | IgG1 |
| **Applications:** | Suitable for immunoprecipitation (IP) and Western blot (WB), working concentration/ dilution should be determined empirically. |

### Image




**Lane 1:** MW Markers
**Lane 2:** HeLa Lysate IP Flow Through
**Lane 3:** HeLa Lysate IP Eluate
**Lane 4:** Carbamylated HeLa Lysate IP Flow Through
**Lane 5:** Carbamylated HeLa Lysate IP Eluate
**Lane 6:** HeLa Lysate Inputs (10 µg)
**Lane 7:** Carbamylated HeLa Lysate Inputs (10 µg)

**WB of Carbamylation Affinity Sorbent.** HeLa cells were lysed and a portion of the lysates were carbamylated. 100 µg HeLa and carbamylated HeLa cell lysates were applied to the carbamylation affinity sorbent with overnight incubation. The sorbent was washed and eluted with SDS-PAGE sample buffer followed by WB analysis using Anti-Carbamylation (Homocitrulline) Polyclonal Antibody (Item No. 22428).



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## Description

Carbamylation is a non-enzymatic and irreversible post-translational protein modification whereby cyanate/isocyanic acid adds a carbamoyl group to the ε-amino of lysine side chains, converting lysine to the non-standard amino acid homocitrulline.[1,2] Cyanate is formed primarily from the breakdown of urea but can also be formed from the oxidation of thiocyanate by myeloperoxidase in the presence of hydrogen peroxide at sites of inflammation, such as atherosclerotic tissues.[1-3] LDL can be carbamylated and has atherogenic properties, disrupting LDL receptor binding and increasing vascular smooth muscle cell proliferation and endothelial cell death.[3,4] Protein carbamylation and carbamylated LDL levels are increased in the plasma of patients with disorders resulting in high levels of urea, such as chronic and end-stage renal diseases.[2,4] Furthermore, the levels of plasma protein-bound homocitrulline positively correlate with the frequency of, and mortality from, major adverse cardiac events and predict cardiovascular disease risk.[3] Carbamylated proteins can also induce an immune response leading to the production of anti-homocitrulline autoantibodies, which have been found at higher levels in individuals with rheumatoid arthritis and are positively associated with the degree of joint damage.[5] Cayman's Carbamylation Affinity Sorbent (Item No. 601931) is designed for immunoprecipitation (IP) of carbamylated protein from biological samples. This is an effective way to concentrate carbamylated protein for subsequent detection by a different carbamylation antibody by IP and Western blot (WB). This carbamylation affinity sorbent consists of Anti-Carbamylation (Homocitrulline) Monoclonal Antibody (Clone 1C6) (Item No. 23203) coupled to Sepharose™. This antibody coupled sorbent should be used as a capture/enrichment tool, but is not guaranteed to pull down all carbaymylated residues (see the presence of carbamylated protein in the flow through of the highly carbamylated sample illustrated above).

## References


1. Stark, G.R., Stein, W.H., and Moore, S. Reactions of cyanate present in aqueous urea with amino acids and proteins. *J. Biol. Chem.* **235(11)**, 3177-3181 (1960).
2. Long, J., Vela Parada, X., and Kalim, S. Protein carbamylation in chronic kidney disease and dialysis. *Adv. Clin. Chem.* **87**, 37-67 (2018).
3. Wang, Z., Nicholls, S.J., Rodriquez, E.R., *et al.* Protein carbamylation links inflammation, smoking, uremia and atherogenesis. *Nat. Med.* **13(1)**, 1176-1184 (2007).
4. Ok, E., Basnakian, A.G., Apostolov, E.O., *et al.* Carbamylated low-density lipoprotein induces death of endothelial cells: A link to atherosclerosis in patients with kidney disease. *Kidney Int.* **68(1)**, 173-178 (2005).
5. Shi, J., Knevel, R., Suwannalai, P., *et al.* Autoantibodies recognizing carbamylated proteins are present in sera of patients with rheumatoid arthritis and predict joint damage. *Proc. Natl. Acad. Sci. USA* **108(42)**, 17372-17377 (2011).



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