

Homocitrulline/Citrulline Assay Kit

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CATALOG #
AAA44643

PRODUCT SYNONYMS

Homocitrulline/Citrulline; Homocitrulline/Citrulline Assay Kit; Homocitrulline/Citrulline assay kit

PRODUCT SPECIFICATIONS

Preparation and Storage

Upon receipt, store the Homocitrulline Standard, Citrulline Standard, and Proteinase K at -20 degree C. Store all the other reagents at room temperature.

ADDITIONAL INFORMATION

Related Product Information for Homocitrulline/Citrulline assay kit

Principle of the Assay: Homocitrulline/Citrulline Assay Kit provides a convenient colorimetric method for the detection of total homocitrulline/citrulline from cells, tissue, plasma, serum, or urine samples. First, the samples are treated with sodium dodecyl sulfate (SDS) and Proteinase K to release free homocitrulline/citrulline residues. Assay Reagents are added to the well which reacts with homocitrulline and citrulline to produce a chromophore (Figure 2) and the absorbance is read at 540-560 nm. The content of homocitrulline and citrulline in the unknown samples is determined by comparison with a predetermined standard curve. The provided reagents are sufficient for the evaluation of 100 assays including standards and unknown samples.

Background/Introduction: Homocitrulline is an amino acid found in mammalian metabolism as a free-form metabolite of ornithine (another amino acid not found in proteins but is involved in the urea cycle). Through the process of carbamylation, homocitrulline amino acid residues can also be formed in proteins. Carbamylation results from the binding of isocyanic acid with amino groups (isocyanic acid spontaneously derived from high concentrations of urea) and primarily leads to the formation of either N-terminally carbamylated proteins and/or carbamylated lysine side chains (forming homocitrulline residues) (Figure 1A). It is known that elevated urea directly induces the formation of potentially atherogenic carbamylated LDL (cLDL). High blood concentrations of urea leading to the carbamylation process were detected in uremic patients and patients with end-stage renal disease. Homocitrulline can be detected in larger amounts in the urine of individuals with urea cycle disorders. Citrulline is an amino acid very similar in structure to homocitrulline; however, the former is one methylene group shorter than the latter. In mammals, free citrulline is produced from free arginine during the enzymatic generation of nitric oxide (NO) by nitric oxide synthase (NOS) (Figure 1B). In addition, citrulline is synthesized from ornithine and carbamoyl phosphate in one of the main reactions of the urea cycle, a process that causes excretion of ammonia. Citrulline is not normally incorporated into proteins, but can be found in proteins due to post translational modification. The enzyme peptidylarginine deiminase (PADI) can convert arginine to citrulline in the presence of calcium (Figure 1C). Since rheumatoid arthritis (RA) patients often produce autoantibodies to peptides containing citrulline, it has been suggested that PADI enzymes are involved in the disease. Recently it has been shown that haplotype PADI4 is associated with susceptibility to RA. Homocitrulline has been suggested as a confounding antigen for rheumatoid arthritis antibodies targeting citrullinated proteins/peptides. Antibodies binding to homocitrulline-containing sequences have been found in rheumatoid arthritis patients' sera. It has also been shown that homocitrulline-containing proteins are present in rheumatoid arthritis (RA) joints. Homocitrulline/Citrulline Assay Kit is a simple colorimetric assay that measures the amount of total homocitrulline and citrulline present in biological samples in a 96-well microtiter plate format. Each kit provides sufficient reagents to perform up to 100 assays, including blanks, homocitrulline or citrulline standards, and unknown samples. Sample homocitrulline/citrulline concentrations are determined by comparison with a known homocitrulline or citrulline standard. The kit has a detection sensitivity limit of 37.5 uM homocitrulline or citrulline.

Product Categories/Family for Homocitrulline/Citrulline assay kit

Metabolism Research; Renal Function; Protein Carbamylation Assays and Reagents

For Research Use Only. Not for use in diagnostic or therapeutic procedures. Small volumes of product may become entrapped in the seal of the vial during shipment and storage; if necessary, briefly centrifuge the vial on a tabletop centrifuge to dislodge any liquid in the cap.

