



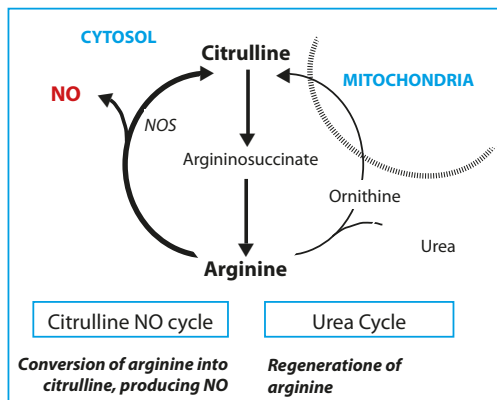
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L-Citrulline

Nitrosative stress: Detection of urinary citrulline as surrogate marker for NO

Nitric oxide (NO) is a free-radical gas and is an important signalling molecule that acts in many tissues to regulate a diverse range of physiological processes. Since the discovery that nitric oxide is able to induce vasodilation a large number of other roles have been described for NO. It is also known to play a role in the immune system, the nervous system, in inflammation and in programmed cell death (apoptosis). NO has also been implicated in smooth muscle relaxation, fertilization and blood vessel formation (angiogenesis).

The biological effects of NO are mediated through the reaction of NO with a number of targets such as haem groups, sulphhydryl groups and iron and zinc clusters.



Role of NO in the immune system

NO can be produced by a number of cells involved in immune responses. In particular cytokine-activated macrophages can produce high concentrations of NO in order to kill target cells such as bacteria or tumour cells. NO-mediated cytotoxicity is often associated with the formation of nitrosyl-thiol complexes in enzymes within the target cell.

NO has been shown to kill cells by disrupting enzymes involved in the Krebs cycle, DNA synthesis and mitochondrial function.

Role of NO in inflammation

NO may act as a mediator of inflammatory processes. It enhances the effect of cyclooxygenase (COX) and stimulates the production of pro-inflammatory eicosanoids. Furthermore, NO production can be induced, through the upregulation of iNOS (inducible nitric oxide synthases), by a number of factors involved in inflammation, including interleukins, interferon-gamma, TNF-alpha and LPS.

L-citrulline as surrogate marker for NO

Measurement of NO production in vivo is difficult because of its short half-life and the need for specialised equipment that uses chemiluminescence detection. Citrulline level can be used as surrogate marker for estimating NO production.

Indications for the detection of urinary citrulline

- ▶ Estimating the NOS activity (NO production)
- ▶ Detection of nitrosative stress due to an enhanced synthesis of inducible nitric oxide (iNO)

L-Citrulline	
Matrix	Urine, serum, plasma
Sample volume	500 µL
Test principle	photometric
Cat. No.	K 6600



US: all products: Research Use Only.
 Not for use in diagnostic procedures.

Literature:

Yu JJ, Oh SH (2010) Isolation and characterization of lactic acid bacteria strains with ornithine producing capacity from natural sea salt. J Microbiol 48(4): 467-72

Wanchu A (2001) Serum and Urine Nitrite and Citrulline Levels among Patients with Systemic Lupus Erythematosus: A possible Addition to Activity Parameters? J Clin Rheumatol 7 (1):10-5