

# Isothiocyanates from Watercress

Watercress (*Nasturtium officinale*) is a member of the cruciferous vegetable family. Like other cruciferous plants, watercress is a rich source of isothiocyanates. These compounds exhibit anti-cancer properties and induce activity of phase II enzymes<sup>1</sup>. The primary active component of watercress is **Phenylethyl Isothiocyanate (PEITC, P2508)**, followed by **7-Methylsulfinylheptyl Isothiocyanate (MSH, I7456)** and **8-Methylsulfinyloctyl Isothiocyanate (MSO, I7459)**.

PEITC exhibits chemopreventive and chemotherapeutic activities in various models. In prostate cancer cells, PEITC induces apoptotic cell death in a ROS-dependent manner involving inhibition of oxidative phosphorylation and depletion of ATP<sup>2</sup>. In animals with prostate cancer tumor xenografts, PEITC inhibits tumor PECAM-1 and several integrin family proteins, suppressing angiogenesis and tumor growth<sup>3</sup>.

One enzyme that PEITC induces is quinone reductase, a key component in the regulation

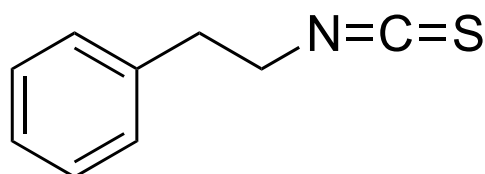
of ROS levels. Both MSH and MSO also induce quinone reductase activity as well and may exert more potent activity on phase II enzyme induction.

Many other isothiocyanates can be found in cruciferous vegetables, including **R-Sulforaphane (S3046)**, **Phenylhexyl Isothiocyanate (PHITC, P2922)**, and **R-(-)-Iberin (I0417)**. Isothiocyanates that can be found in broccoli and watercress suppress TPA-induced activity of MMP-9 and invasiveness of breast cancer cells in vitro<sup>4</sup>. A separate study indicates that isothiocyanates such as PEITC and sulforaphane directly interact with histones and chromatin remodeling proteins, potentially inhibiting histone deacetylase activity and DNA methylation<sup>5</sup>.

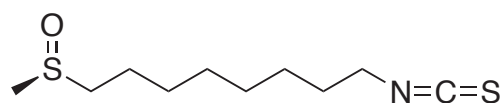
LKT Laboratories also offers several of the methylsulfinylalkyl isothiocyanates in chiral form, including **(R)-1-Isothiocyanato-8-(methylsulfinyl)-octane (I7460)** and **(R)-1-Isothiocyanato-7-(methylsulfinyl)-heptane (I7455)**.

## References:

1. Rose P, Faulkner K, Williamson G, et al. Carcinogenesis. 2000 Nov;21(11):1983-8.
2. Xiao D, Powolny AA, Moura MB, et al. J Biol Chem. 2010 Aug 20;285(34):26558-69.
3. Hudson TS, Perkins SN, Hursting SD, et al. Int J Oncol. 2012 Apr;40(4):1113-21.
4. Rose P, Huang Q, Ong CN, et al. Toxicol Appl Pharmacol. 2005 Dec 1;209(2):105-13.
5. Gerhauser C. Curr Opin Clin Nutr Metab Care. 2013 Jul;16(4):405-10.



P2508 Phenylethyl Isothiocyanate



I7460 (R)-1-Isothiocyanato-8-(methylsulfinyl)-octane

