

CLINICAL SPECIFICATIONS

BISPHENOL A

Chemical Found In:

Bisphenol A (BPA) is used to make polycarbonate polymers and epoxy resins, along with other materials used to make plastics, including water bottles and other food and beverage containers. Paper products, most notably thermal receipt paper, have now been shown to also contain significant amounts of BPA.

Sources:

<http://www.niehs.nih.gov/health/topics/agents/sya-bpa>

Known Cross-Reactions: BPA IgG with Myelin Basic Protein, BPA IgM with Myelin Basic Protein, Myelin Oligodendrocyte Glycoprotein, Protein disulfide isomerase⁷

Clinical Significance:

The detection of antibodies to Bisphenol A (BPA) bound to human protein in serum indicates a breakdown in immunological tolerance and induction of chemical intolerance. BPA or its metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity.

BPA functions as a xenoestrogen by binding strongly to estrogen-related receptor γ (ERR- γ).³ In adults, BPA is eliminated from the body through a detoxification process in the liver; however, in infants and children, the pathway is not fully developed, which prevents them from clearing BPA from their systems.¹ In a rat study, significant, in vitro, inhibition of BPA detoxification was found with nine drugs including naproxen, salicylic acid, carbamazepine and mefenamic acid.⁶

Persons with antibodies to BPA bound to human protein in serum should avoid exposure to the substance, with special attention taken to clean up the home and work environments.

References:

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3. Matsushima, et al. Structural evidence for endocrine disruptor bisphenol A binding to human nuclear receptor ERR gamma. *J Biochem*, 2007; 142(4):517-524.
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6. Verner, et al. High concentrations of commonly used drugs can inhibit the in vitro glucuronidation of bisphenol A and nonylphenol in rats. *Xenobiotica*, 2009; 40(2):83-92.
7. Kharrazian and Vojdani. Correlation between antibodies to bisphenol A, its target enzyme protein disulfide isomerase and antibodies to neuron-specific antigens. *J Appl Toxicol*, 2017; 37:479-484.