

Aluminum Adjuvants

Abstract: *Aluminum vaccine adjuvants: are they safe?* [Curr Med Chem.](#) 2011;18(17):2630-7.

“Aluminum is an experimentally demonstrated neurotoxin and the most commonly used vaccine adjuvant. Despite almost 90 years of widespread use of aluminum adjuvants, medical science’s understanding about their mechanisms of action is still remarkably poor. There is also a concerning scarcity of data on toxicology and pharmacokinetics of these compounds. In spite of this, the notion that aluminum in vaccines is safe appears to be widely accepted. Experimental research, however, clearly shows that **aluminum adjuvants have a potential to induce serious immunological disorders in humans. In particular, aluminum in adjuvant form carries a risk for autoimmunity, long-term brain inflammation and associated neurological complications and may thus have profound and widespread adverse health consequences.** In our opinion, the possibility that vaccine benefits may have been overrated and the risk of potential adverse effects underestimated, has not been rigorously evaluated in the medical and scientific community.”

A few of the many Aluminum Toxicity Studies

- 2002 [“Neurological adverse events associated with vaccination.”](#)
- 2007 [“Neurological adverse events of immunization: experience with an aluminum adjuvanted meningococcal B. . .](#)
- 2007 [“Inflammation, neurodegenerative diseases, and environmental exposures.”](#)
- 2009 [“Long-term persistence of vaccine-derived aluminum hydroxide is associated with chronic cognitive dys. . .](#)
- 2009 [“Aluminum hydroxide injections lead to motor deficits and motor neuron degeneration.”](#)
- 2009 [“Aluminum-induced defective mitochondrial metabolism perturbs cytoskeletal dynamics in human astrocytes.”](#)
- 2011 [“Aluminum toxicity and astrocyte dysfunction: a metabolic link to neurological disorders.”](#)
- 2011 [“Aluminum vaccine adjuvants: are they safe?”](#)
- 2011 [“Metal ions affecting the neurological system.”](#)
- 2013 [“Autoimmune/autoinflammatory syndrome induced by adjuvants \(ASIA syndrome\) in commercial sheep.”](#)
- 2013 [“How aluminum, an intracellular ROS generator promotes hepatic and neurological diseases: the metabolic. . .](#)
- 2014 [“Aluminum-induced entropy in biological systems: implications for neurological disease.”](#)
- 2014 [“Are there negative CNS impacts of aluminum adjuvants used in vaccines and immunotherapy?”](#)
- 2014 [“A sudden onset of a pseudo-neurological syndrome after HPV-16/18 AS04-adjuvated vaccine: . . .](#)
- 2014 [“Prolonged exposure to low levels of aluminum leads to changes associated with . . . neurodegeneration.”](#)
- 2014 [“Administration of aluminium to neonatal mice in vaccine-relevant amounts is associated with adverse long. . .](#)
- 2014 [“Oxidative stress and mitochondrial dysfunction in aluminium neurotoxicity and its amelioration: a review “](#)
- 2014 [“Aluminum in the \(CNS\): toxicity in humans and animals, vaccine adjuvants, and autoimmunity.”](#)
- 2015: [“Biopersistence and brain translocation of aluminum adjuvants of vaccines”](#)
- 2016: [“Insight into cellular fate & toxicity of aluminum adjuvants used in clinically approved human vaccinations”](#)
- 2016 [“Behavioral abnormalities in female mice following administration of aluminum adjuvants and Gardasil.”](#)
 “Vaccine adjuvants and vaccines may induce autoimmune and inflammatory manifestations in susceptible individuals. **To date most human vaccine trials utilize aluminum (Al) adjuvants as placebos despite much evidence showing that Al in vaccine-relevant exposures can be toxic to humans and animals.** We sought to evaluate the effects of Al adjuvant and the HPV vaccine Gardasil versus the true placebo on behavioral and inflammatory parameters in female mice.”
- 2016 [“Aluminum adjuvants of vaccines injected into the muscle: Normal fate, pathology and associated disease.”](#)
 “Although generally well tolerated on the short term, it has been suspected to occasionally cause delayed neurologic problems in susceptible individuals. In particular, the long-term persistence of aluminum granuloma also termed macrophagic myofasciitis is associated with chronic arthromyalgias and fatigue and cognitive dysfunction. . . These novel insights strongly suggest that serious re-evaluation of long-term aluminum adjuvant pharmacokinetics and safety should be carried out.”