While glyphosate belongs to the organophosphorus family and some studies suggest it weakly inhibits cholinesterase in fish and mammals, **there's no conclusive evidence of it inhibiting human acetylcholinesterase (AChE) and butyrylcholinesterase (BChE)**, and its neurotoxic effects are not primarily linked to the cholinergic system. [[1](https://pubmed.ncbi.nlm.nih.gov/38548375/), [2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/), [3](https://www.mdpi.com/2039-4713/14/2/35#:~:text=Also%2C%20some%20in%20vitro%20assays%20suggest%20that,inhibition%20ranges%20between%2011.0%20and%2017.6%%20[8%2C23%2C24].&text=Indeed%2C%20since%20glyphosate%20belongs%20to%20the%20organophosphorus,a%20biomarker%20of%20OP%20pesticide%20exposure%20[27%2C28].), [4](https://pubmed.ncbi.nlm.nih.gov/27258137/)]

**Here's a more detailed explanation: [**[**1**](https://pubmed.ncbi.nlm.nih.gov/38548375/)**,** [**2**](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/)**]**

* **Glyphosate and Organophosphates:** Glyphosate, a common herbicide, is chemically classified as an organophosphorus pesticide. Organophosphates are known for their neurotoxic effects, often inhibiting enzymes like AChE and BChE, which are crucial for maintaining neurotransmission. [[1](https://pubmed.ncbi.nlm.nih.gov/38548375/), [2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/)]
* **Cholinesterase Inhibition in Animals:** Research indicates that glyphosate is a weak cholinesterase inhibitor in fish and mammals, but the inhibition is not as potent as other organophosphate compounds. [[1](https://pubmed.ncbi.nlm.nih.gov/38548375/), [2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/)]
* **Human Cholinesterase Inhibition:** There is a lack of conclusive data regarding the inhibition of human AChE and BChE by glyphosate. [[1](https://pubmed.ncbi.nlm.nih.gov/38548375/), [2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/)]
* **Studies on Rats and Fish:** Studies on rats and fish have shown that glyphosate can affect AChE activity, but the effects are not as strong as those seen with other organophosphates. [[4](https://pubmed.ncbi.nlm.nih.gov/27258137/), [5](https://pubmed.ncbi.nlm.nih.gov/16174533/)]
* **Mechanism of Action:** Glyphosate's primary mechanism of action involves inhibiting a plant enzyme called EPSPS, which is crucial for the biosynthesis of essential amino acids in plants. [[6](https://pubmed.ncbi.nlm.nih.gov/9514851/#:~:text=Glyphosate%20(Roundup)%20is%20an%20herbicide%20used%20extensively,transgenic%20herbicide%20resistant%20plants%20have%20been%20developed.), [7](https://pubs.acs.org/doi/10.1021/ar950122%2B#:~:text=Numerous%20physiological%2C%20biochemical%2C%20and%20genetic%20experiments%20have,found%20only%20in%20plants%20and%20certain%20microorganisms.)]
* **Neurotoxic Effects:** While some studies suggest that glyphosate exposure can lead to oxidative stress and affect the cholinergic system, the neurotoxic effects of glyphosate are not primarily linked to the cholinergic system. [[2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/), [8](https://www.sciencedirect.com/science/article/pii/S0045653509012739), [9](https://pubmed.ncbi.nlm.nih.gov/30682438/#:~:text=Learning%20and%20memory%20impairments%20associated%20to%20acetylcholinesterase,stress%20following%20glyphosate%20based%2Dherbicide%20exposure%20in%20mice.), [10](https://link.springer.com/article/10.1007/s11356-019-06804-5#:~:text=This%20study%20had%20determined%20the%20effect%20of,(AChE)%20enzyme%20activity%2C%20oxidative%20stress%2C%20and%20antioxidant.), [11](https://pubmed.ncbi.nlm.nih.gov/29990293/), [12](https://pubmed.ncbi.nlm.nih.gov/31991143/)]
* **Environmental Exposure:** Environmental exposure to glyphosate may not pose a significant risk of inhibiting human AChE and BChE. [[1](https://pubmed.ncbi.nlm.nih.gov/38548375/), [2](https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/)]
* **Other Effects:** Glyphosate has been associated with other health effects, such as cytotoxic and genotoxic effects, inflammation, and effects on the immune system. [[13](https://wwwn.cdc.gov/tsp/ToxFAQs/ToxFAQsDetails.aspx?faqid=1489&toxid=293#:~:text=If%20a%20large%20amount%20is%20swallowed%2C%20glyphosate,or%20asthma%2C%20in%20people%20using%20glyphosate%20products.), [14](https://pubmed.ncbi.nlm.nih.gov/32897110/#:~:text=In%20mammals%2C%20including%20humans%2C%20glyphosate%20mainly%20has,interactions%20between%20microorganisms%20and%20the%20immune%20system.)]
* **Controversy:** There is ongoing debate and scientific discussion regarding the potential health effects of glyphosate exposure, including concerns about its potential carcinogenicity. [[15](https://www.nytimes.com/2025/02/19/well/glyphosate-health-cancer.html#:~:text=In%202015%2C%20the%20International%20Agency%20for%20Research,is%20used%20according%20to%20the%20pesticide%20label.''), [16](https://www.wisnerbaum.com/toxic-tort-law/monsanto-roundup-lawsuit/where-is-glyphosate-banned-/)]

*Generative AI is experimental.*

[1] <https://pubmed.ncbi.nlm.nih.gov/38548375/>

[2] <https://pmc.ncbi.nlm.nih.gov/articles/PMC10978157/>

[3] [https://www.mdpi.com/2039-4713/14/2/35](https://www.mdpi.com/2039-4713/14/2/35#:~:text=Also%2C%20some%20in%20vitro%20assays%20suggest%20that,inhibition%20ranges%20between%2011.0%20and%2017.6%%20[8%2C23%2C24].&text=Indeed%2C%20since%20glyphosate%20belongs%20to%20the%20organophosphorus,a%20biomarker%20of%20OP%20pesticide%20exposure%20[27%2C28].)

[4] <https://pubmed.ncbi.nlm.nih.gov/27258137/>

[5] <https://pubmed.ncbi.nlm.nih.gov/16174533/>

[6] [https://pubmed.ncbi.nlm.nih.gov/9514851/](https://pubmed.ncbi.nlm.nih.gov/9514851/#:~:text=Glyphosate%20(Roundup)%20is%20an%20herbicide%20used%20extensively,transgenic%20herbicide%20resistant%20plants%20have%20been%20developed.)

[7] [https://pubs.acs.org/doi/10.1021/ar950122%2B](https://pubs.acs.org/doi/10.1021/ar950122%2B#:~:text=Numerous%20physiological%2C%20biochemical%2C%20and%20genetic%20experiments%20have,found%20only%20in%20plants%20and%20certain%20microorganisms.)

[8] <https://www.sciencedirect.com/science/article/pii/S0045653509012739>

[9] [https://pubmed.ncbi.nlm.nih.gov/30682438/](https://pubmed.ncbi.nlm.nih.gov/30682438/#:~:text=Learning%20and%20memory%20impairments%20associated%20to%20acetylcholinesterase,stress%20following%20glyphosate%20based%2Dherbicide%20exposure%20in%20mice.)

[10] [https://link.springer.com/article/10.1007/s11356-019-06804-5](https://link.springer.com/article/10.1007/s11356-019-06804-5#:~:text=This%20study%20had%20determined%20the%20effect%20of,(AChE)%20enzyme%20activity%2C%20oxidative%20stress%2C%20and%20antioxidant.)

[11] <https://pubmed.ncbi.nlm.nih.gov/29990293/>

[12] <https://pubmed.ncbi.nlm.nih.gov/31991143/>

[13] [https://wwwn.cdc.gov/tsp/ToxFAQs/ToxFAQsDetails.aspx?faqid=1489&toxid=293](https://wwwn.cdc.gov/tsp/ToxFAQs/ToxFAQsDetails.aspx?faqid=1489&toxid=293#:~:text=If%20a%20large%20amount%20is%20swallowed%2C%20glyphosate,or%20asthma%2C%20in%20people%20using%20glyphosate%20products.)

[14] [https://pubmed.ncbi.nlm.nih.gov/32897110/](https://pubmed.ncbi.nlm.nih.gov/32897110/#:~:text=In%20mammals%2C%20including%20humans%2C%20glyphosate%20mainly%20has,interactions%20between%20microorganisms%20and%20the%20immune%20system.)

[15] [https://www.nytimes.com/2025/02/19/well/glyphosate-health-cancer.html](https://www.nytimes.com/2025/02/19/well/glyphosate-health-cancer.html#:~:text=In%202015%2C%20the%20International%20Agency%20for%20Research,is%20used%20according%20to%20the%20pesticide%20label.'')

[16] <https://www.wisnerbaum.com/toxic-tort-law/monsanto-roundup-lawsuit/where-is-glyphosate-banned-/>