

**List of most relevant papers regarding D-amino acids and Alzheimer's disease  
from PubMed (<https://www.ncbi.nlm.nih.gov/pubmed>), October, 1<sup>st</sup>, 2019**

Sorted by date (most recent first)

1. [D-glutamate, D-serine, and D-alanine differ in their roles in cognitive decline in patients with Alzheimer's disease or mild cognitive impairment.](#)

Lin CH, Yang HT, Lane HY.

Pharmacol Biochem Behav. 2019 Oct;185:172760. doi: 10.1016/j.pbb.2019.172760. Epub 2019 Aug 15.  
PMID: 31422081

2. [Neurotoxic astrocytes express the D-serine synthesizing enzyme, serine racemase, in Alzheimer's disease.](#)

Balu DT, Pantazopoulos H, Huang CCY, Muszynski K, Harvey TL, Uno Y, Rorabaugh JM, Galloway CR, Botz-Zapp C, Berretta S, Weinschenker D, Coyle JT.

Neurobiol Dis. 2019 Oct;130:104511. doi: 10.1016/j.nbd.2019.104511. Epub 2019 Jun 15.  
PMID: 31212068

3. [pLG72 levels increase in early phase of Alzheimer's disease but decrease in late phase.](#)

Lin CH, Chiu CC, Huang CH, Yang HT, Lane HY.

Sci Rep. 2019 Sep 13;9(1):13221. doi: 10.1038/s41598-019-49522-1.  
PMID: 31520071 [Free PMC Article](#)

4. [Sodium benzoate for the treatment of behavioral and psychological symptoms of dementia \(BPSD\): A randomized, double-blind, placebo-controlled, 6-week trial.](#)

Lin CH, Chen PK, Wang SH, Lane HY.

J Psychopharmacol. 2019 Aug;33(8):1030-1033. doi: 10.1177/0269881119849815. Epub 2019 May 22.  
PMID: 31113277

5. [The Role of N-Methyl-D-Aspartate Receptor Neurotransmission and Precision Medicine in Behavioral and Psychological Symptoms of Dementia.](#)

Lin CH, Lane HY.

Front Pharmacol. 2019 May 22;10:540. doi: 10.3389/fphar.2019.00540. eCollection 2019. Review.  
PMID: 31191302 [Free PMC Article](#)

6. [Changes in Serine Racemase-Dependent Modulation of NMDA Receptor: Impact on Physiological and Pathological Brain Aging.](#)

Billard JM.

Front Mol Biosci. 2018 Nov 28;5:106. doi: 10.3389/fmolb.2018.00106. eCollection 2018. Review.  
PMID: 30555832 [Free PMC Article](#)

7. [Impact of Aging in Microglia-Mediated D-Serine Balance in the CNS.](#)

Beltrán-Castillo S, Eugénin J, von Bernhardi R

Mediators Inflamm. 2018 Sep 27;2018:7219732. doi: 10.1155/2018/7219732. eCollection 2018. Review.  
PMID: 30363571 [Free PMC Article](#)

8. [Potential and Challenges for the Clinical Use of D-Serine As a Cognitive Enhancer.](#)  
Guercio GD, Panizzutti R.  
Front Psychiatry. 2018 Feb 5;9:14. doi: 10.3389/fpsy.2018.00014. eCollection 2018. Review.  
PMID: 29459833 [Free PMC Article](#)
9. [Role of Glutamate and NMDA Receptors in Alzheimer's Disease.](#)  
Wang R, Reddy PH.  
J Alzheimers Dis. 2017;57(4):1041-1048. doi: 10.3233/JAD-160763. Review.  
PMID: 27662322 [Free PMC Article](#)
10. [Blood levels of D-amino acid oxidase vs. D-amino acids in reflecting cognitive aging.](#)  
Lin CH, Yang HT, Chiu CC, Lane HY.  
Sci Rep. 2017 Nov 1;7(1):14849. doi: 10.1038/s41598-017-13951-7.  
PMID: 29093468 [Free PMC Article](#)
11. [Development of an UPLC-MS/MS method for simultaneous quantitation of 11 D-amino acids in different regions of rat brain: Application to a study on the associations of D-amino acid concentration changes and Alzheimer's disease.](#)  
Li Z, Xing Y, Guo X, Cui Y.  
J Chromatogr B Analyt Technol Biomed Life Sci. 2017 Jul 15;1058:40-46.  
doi: 10.1016/j.jchromb.2017.05.011. Epub 2017 May 11.  
PMID: 28531844
12. [Dysfunction of NMDA receptors in Alzheimer's disease.](#)  
Zhang Y, Li P, Feng J, Wu M.  
Neurol Sci. 2016 Jul;37(7):1039-47. doi: 10.1007/s10072-016-2546-5. Epub 2016 Mar 12. Review.  
PMID: 26971324 [Free PMC Article](#)
13. [CSF D-serine concentrations are similar in Alzheimer's disease, other dementias, and elderly controls.](#)  
Biemans EA, Verhoeven-Duif NM, Gerrits J, Claassen JA, Kuiperij HB, Verbeek MM.  
Neurobiol Aging. 2016 Jun;42:213-6. doi: 10.1016/j.neurobiolaging.2016.03.017. Epub 2016 Mar 23.  
PMID: 27143438
14. [Simultaneous determination of 18 D-amino acids in rat plasma by an ultrahigh-performance liquid chromatography-tandem mass spectrometry method: application to explore the potential relationship between Alzheimer's disease and D-amino acid level alterations.](#)  
Xing Y, Li X, Guo X, Cui Y.  
Anal Bioanal Chem. 2016 Jan;408(1):141-50. doi: 10.1007/s00216-015-9086-3. Epub 2015 Oct 24.  
PMID: 26497841
15. [D-serine levels in Alzheimer's disease: implications for novel biomarker development.](#)  
Madeira C, Lourenco MV, Vargas-Lopes C, Suemoto CK, Brandão CO, Reis T, Leite RE, Laks J, Jacob-Filho W, Pasqualucci CA, Grinberg LT, Ferreira ST, Panizzutti R.  
Transl Psychiatry. 2015 May 5;5:e561. doi: 10.1038/tp.2015.52.  
PMID: 25942042 [Free PMC Article](#)

16. [Benzoate, a D-amino acid oxidase inhibitor, for the treatment of early-phase Alzheimer disease: a randomized, double-blind, placebo-controlled trial.](#)  
Lin CH, Chen PK, Chang YC, Chuo LJ, Chen YS, Tsai GE, Lane HY.  
Biol Psychiatry. 2014 May 1;75(9):678-85. doi: 10.1016/j.biopsych.2013.08.010. Epub 2013 Sep 25.  
PMID: 24074637
17. [The role of N-methyl-D-aspartate receptor in Alzheimer's disease.](#)  
Zhang J, Li Y, Xu J, Yang Z.  
J Neurol Sci. 2014 Apr 15;339(1-2):123-9. doi: 10.1016/j.jns.2014.01.041. Epub 2014 Feb 6.  
PMID: 24548486
18. [The effects of subchronic D-serine on left-right discrimination learning, social interaction, and exploratory activity in APPswe/PS1 mice.](#)  
Filali M, Lalonde R.  
Eur J Pharmacol. 2013 Feb 15;701(1-3):152-8. doi: 10.1016/j.ejphar.2012.12.018. Epub 2012 Dec 28.  
PMID: 23276661
19. [D-Amino acids in brain neurotransmission and synaptic plasticity.](#)  
Billard JM.  
Amino Acids. 2012 Nov;43(5):1851-60. doi: 10.1007/s00726-012-1346-3. Epub 2012 Aug 11. Review.  
PMID: 22886346
20. [D-serine regulation: a possible therapeutic approach for central nervous diseases and chronic pain.](#)  
Sethuraman R, Lee TL, Tachibana S.  
Mini Rev Med Chem. 2009 Jun;9(7):813-9. Review.  
PMID: 19519506
21. [NMDA- and beta-amyloid1-42-induced neurotoxicity is attenuated in serine racemase knock-out mice.](#)  
Inoue R, Hashimoto K, Harai T, Mori H.  
J Neurosci. 2008 Dec 31;28(53):14486-91. doi: 10.1523/JNEUROSCI.5034-08.2008.  
PMID: 19118183 [Free PMC Article](#)
22. [Simultaneous analysis of D- and L-serine in cerebrospinal fluid by use of HPLC.](#)  
Sethuraman R, Krishnamoorthy MG, Lee TL, Liu EH, Chiang S, Nishimura W, Sakai M, Minami T, Tachibana S.  
Clin Chem. 2007 Aug;53(8):1489-94. Epub 2007 Jun 22.  
PMID: 17586591 [Free Article](#)
23. [Induction of serine racemase expression and D-serine release from microglia by secreted amyloid precursor protein \(sAPP\).](#)  
Wu S, Basile AS, Barger SW.  
Curr Alzheimer Res. 2007 Jul;4(3):243-51.  
PMID: 17627481

24. [Induction of serine racemase expression and D-serine release from microglia by amyloid beta-peptide.](#)  
Wu SZ, Bodles AM, Porter MM, Griffin WS, Basile AS, Barger SW.  
J Neuroinflammation. 2004 Apr 20;1(1):2.  
PMID: 15285800 [Free PMC Article](#)
25. [Possible role of D-serine in the pathophysiology of Alzheimer's disease.](#)  
Hashimoto K, Fukushima T, Shimizu E, Okada S, Komatsu N, Okamura N, Koike K, Koizumi H, Kumakiri C, Imai K, Iyo M.  
Prog Neuropsychopharmacol Biol Psychiatry. 2004 Mar;28(2):385-8.  
PMID: 14751437
26. [Improved cognition in Alzheimer's disease with short-term D-cycloserine treatment.](#)  
Tsai GE, Falk WE, Gunther J, Coyle JT.  
Am J Psychiatry. 1999 Mar;156(3):467-9.  
PMID: 10080566
27. [Regional decreases of free D-aspartate levels in Alzheimer's disease.](#)  
D'Aniello A, Lee JM, Petrucelli L, Di Fiore MM.  
Neurosci Lett. 1998 Jul 3;250(2):131-4.  
PMID: 9697936
28. [Free D- and L-amino acids in ventricular cerebrospinal fluid from Alzheimer and normal subjects.](#)  
Fisher G, Lorenzo N, Abe H, Fujita E, Frey WH, Emory C, Di Fiore MM, D' Aniello A.  
Amino Acids. 1998;15(3):263-9.  
PMID: 9871505
29. [Free D-serine concentration in normal and Alzheimer human brain.](#)  
Nagata Y, Borghi M, Fisher GH, D'Aniello A.  
Brain Res Bull. 1995;38(2):181-3.  
PMID: 7583345
30. [Free D-amino acids in human cerebrospinal fluid of Alzheimer disease, multiple sclerosis, and healthy control subjects.](#)  
Fisher GH, Petrucelli L, Gardner C, Emory C, Frey WH 2nd, Amaducci L, Sorbi S, Sorrentino G, Borghi M, D'Aniello A.  
Mol Chem Neuropathol. 1994 Oct-Dec;23(2-3):115-24.  
PMID: 7702702
31. [Quantification of D-aspartate in normal and Alzheimer brains.](#)  
Fisher GH, D'Aniello A, Vetere A, Cusano GP, Chávez M, Petrucelli L.  
Neurosci Lett. 1992 Aug 31;143(1-2):215-8.  
PMID: 1436669

32. [Free D-aspartate and D-alanine in normal and Alzheimer brain.](#)  
Fisher GH, D'Aniello A, Vetere A, Padula L, Cusano GP, Man EH.  
Brain Res Bull. 1991 Jun;26(6):983-5.  
PMID: 1933416
  
33. [Distribution of neurofibrillary tangle formation and \[3H\]-D-aspartate receptor binding in the thalamus in the normal elderly brain, in Alzheimer's disease and in Parkinson's disease.](#)  
Xuereb JH, Candy JM, Perry EK, Perry RH, Marshall E, Bonham JR.  
Neuropathol Appl Neurobiol. 1990 Dec;16(6):477-88.  
PMID: 1965733
  
34. [D-aspartate in human brain.](#)  
Man EH, Fisher GH, Payan IL, Cadilla-Perezrios R, Garcia NM, Chemburkar R, Arends G, Frey WH 2nd.  
J Neurochem. 1987 Feb;48(2):510-5.  
PMID: 3794720

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