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Bristol Neuroscience  
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## Research interests

I co-lead the Dementia Research Group at the University of Bristol. I am a senior lecturer and ARUK-funded Senior Research Fellow. My research focusses on understanding the causes and contribution of cerebral vascular dysfunction to dementia. I have ~20 years research experience within the field and have published over 60 original research articles and reviews. My research is internationally recognised and I have led on the development of vascular markers to assess vascular dysfunction in post-mortem brain tissue and CSF in dementia. I currently lead a research team and enjoy recruiting and mentoring the career development of junior research staff and PhD students. I have established collaborations with research groups at other UK institutions and academic colleagues overseas. I am a member the British Neuropathology Society Academic committee and the ARUK Grant review board. I regularly review grants from the MRC and national dementia charities and review original research submitted to leading neuropathology and neuroscience journals.

## Employment

### Senior Lecturer in Neuroscience

Bristol Medical School (THS)  
Faculty of Health Sciences  
United Kingdom  
1 May 2022 → present

### Bristol Neuroscience

Institutes  
United Kingdom  
25 Apr 2005 → present

## Research outputs

### Association between plasma angiotensin converting enzyme 1 level and cognition over 12-years: The Look AHEAD Study

Yasar, S., Anderson, A., Hayden, K. M., Espeland, M. A., Carmichael, O. T., Clark, J. M., Carlson, M. C., Asby, D., Kehoe, P. G. & Miners, J. S., 1 Dec 2024.

### Dysregulation of the renin-angiotensin system in vascular dementia

Taylor, H. M., Skrobot, O. A., Baron, D. H., Kehoe, P. G. & Miners, J. S., 20 Jun 2024, In: Brain Pathology. 34, 4, 12 p., e13251.

### A single nuclear transcriptomic characterisation of mechanisms responsible for impaired angiogenesis and blood-brain barrier function in Alzheimer's disease

Tsartalis, S., Steven, H., Fancy, N., Wessely, F., Smith, A. M., Willumsen, N., Cheung, T. K. D., Rokicki, M. J., Chau, V., Ifie, E., Khozoie, C., Ansorge, O., Yang, X., Jenkyns, M. H., Davey, K., McGarry, A., Muirhead, R. C. J., DeBette, S., Jackson, J. S. & Montagne, A. & 6 others, Owen, D. R., Miners, J. S., Love, S., Webber, C., Cader, M. Z. & Matthews, P. M., 12 Mar 2024, (E-pub ahead of print) In: Nature Communications. 15, 1, 19 p., 2243.

### sPDGFR $\beta$ and neuroinflammation are associated with AD biomarkers and differ by race: The ASCEND Study

Butts, B., Huang, H., Hu, W. T., Kehoe, P. G., Miners, J. S., Verble, D. D., Zetterberg, H., Zhao, L., Trotti, L. M., Benamer, K., Scorr, L. M. & Wharton, W., 1 Feb 2024, In: Alzheimer's and Dementia. 20, 2, p. 1175-1189 15 p.

**Elevated CSF angiopoietin-2 correlates with blood-brain barrier leakiness and markers of neuronal injury in early Alzheimer's disease**

Van Hulle, C., Ince, S., Okonkwo, O. C., Bendlin, B. B., Johnson, S. C., Carlsson, C. M., Asthana, S., Love, S., Blennow, K., Zetterberg, H. & Miners, J. S., 5 Jan 2024, (E-pub ahead of print) In: *Translational Psychiatry*. 14, 1, 8 p., 3.

**Altered Gene Expression Within the Renin–Angiotensin System in Normal Aging and Dementia**

Taylor, H. M., MacLachlan, R., Güzel, Ö., Fisher, R. A., Skrobot, O. A., Abulfadl, M. A., Kehoe, P. G. & Miners, J. S., 1 Jan 2024, In: *Journals of Gerontology, Series A*. 79, 1, 10 p., glad241.

**Elevated CSF angiopoietin-2 correlates with blood-brain barrier leakiness and markers of neuronal injury in early Alzheimer's disease**

van Hulle, C., Ince, S., Jonaitis, E., Okonkwo, O. C., Bendlin, B., Johnson, S., Carlsson, C., Asthana, S., Love, S., Blennow, K., Zetterberg, H. & Miners, J. S., 18 Apr 2023, (Research square).

**Elevated late-life blood pressure may maintain brain oxygenation and slow amyloid- $\beta$  accumulation at the expense of cerebral vascular damage**

Taylor, H. M., MacLachlan, R., Güzel, Ö., Miners, J. S. & Love, S., 4 Apr 2023, In: *Brain Communications*. 5, 2, fcad112.

**SARS-CoV-2 targets pericytes to restrict blood flow within the brain**

Miners, J. S., Fisher, R. A. & Love, S., 1 Feb 2023, In: *Brain*. 146, 2, p. 418-420 3 p.

**Age-related reduction in brain ACE-2 is not exacerbated by Alzheimer's disease pathology in mouse models of Alzheimer's disease**

MacLachlan, R. A., Evans, C., Chai, S., Good, M., Kehoe, P. G. & Miners, J. S., 1 Jan 2023, In: *Aging Brain*. 3, 100062.

**Pathological changes within the cerebral vasculature in Alzheimer's disease: New perspectives**

Fisher, R. A., Miners, J. S. & Love, S., 28 Oct 2022, In: *Brain Pathology*. 32, 6, e13061.

**Late-life blood pressure and markers of vascular and disease pathology in Alzheimer's, vascular, and mixed dementia**

Taylor, H. M., Güzel, Ö., MacLachlan, R. A., Miners, J. S. & Love, S., 9 Jun 2022, (Unpublished).

**Dysregulation of ACE-1 in Normal Aging and the Early Stages of Alzheimer's Disease**

MacLachlan, R., Kehoe, P. G. & Miners, J. S., 9 Apr 2022, In: *Journals of Gerontology, Series A*. 77, 9, p. 1775-1783 9 p., glac083.

**Pericyte Contractile Responses to Endothelin-1 and A $\beta$  Peptides: Assessment by Electrical Impedance Assay**

Hibbs, E., Love, S. & Miners, J. S., 20 Aug 2021, In: *Frontiers in Cellular Neuroscience*. 15, p. 723953 723953.

**Systemic infection exacerbates cerebrovascular dysfunction in Alzheimer's disease**

Asby, D., Boche, D., Allan, S., Love, S. & Miners, J. S., 28 Jul 2021, In: *Brain*. 144, 6, p. 1869-1883 15 p.

**Mediators of cerebral hypoperfusion and blood-brain barrier leakiness in Alzheimer's disease, vascular dementia and mixed dementia**

Taylor, H., Miners, J. S., Güzel, Ö., MacLachlan, R. & Love, S., 1 Jul 2021, In: *Brain Pathology*. 31, 4, 12 p., e12935.

**Cognitive impact of COVID-19: looking beyond the short term**

Miners, S., Kehoe, P. G. & Love, S., 30 Dec 2020, In: *Alzheimer's Research and Therapy*. 12, 1, 16 p., 170 (2020).

**UK consensus on pre-clinical vascular cognitive impairment functional outcomes assessment: questionnaire and workshop proceedings**

McFall, A., Hietamies, T. M., Bernard, A., Aimable, M., Allan, S. M., Bath, P. M., Brezzo, G., Carare, R. O., Carswell, H. V., Clarkson, A. N., Currie, G., Farr, T. D., Fowler, J. H., Good, M., Hainsworth, A. H., Hall, C., Horsburgh, K., Kalaria, R., Kehoe, P. & Lawrence, C. & 18 others, Macleod, M., McColl, B. W., McNeilly, A., Miller, A. A., Miners, S., Mok, V., O'Sullivan, M., Platt, B., Sena, E. S., Sharp, M., Strangeward, P., Szymkowiak, S., Touyz, R. M., Trueman, R. C., White, C., McCabe, C., Work, L. M. & Quinn, T. J., 1 Jul 2020, In: *Journal of Cerebral Blood Flow and Metabolism*. 13 p.

**ACE2 activation protects against cognitive decline and reduces amyloid pathology in the Tg2576 mouse model of Alzheimer's disease**

Evans, C., Miners, J. S., Piva, G., Willis, C. L., Heard, D. M., Kidd, E. J., Good, M. & Kehoe, P. G., 25 Jan 2020, In: *Acta Neuropathologica*. 139, p. 485–502 18 p.

**Cerebrospinal fluid changes in the renin-angiotensin system in Alzheimer's disease**

Kehoe, P. G., Al Mulhim, N. S. K., Zetterberg, H., Blennow, K. & Miners, J. S., 12 Nov 2019, In: *Journal of Alzheimer's Disease*. 72, 2, p. 525-535 11 p.

**CSF evidence of pericyte damage in Alzheimer's disease is associated with markers of blood-brain barrier dysfunction and disease pathology**

Miners, J. S., Kehoe, P. G., Love, S., Zetterberg, H. & Blennow, K., 14 Sept 2019, In: *Alzheimer's Research and Therapy*. 11, 6 p., 81.

**Associations of Neprilysin Activity in CSF with Biomarkers for Alzheimer's Disease**

Grimmer, T., Goldhardt, O., Yakushev, I., Ortner, M., Sorg, C., Diehl-Schmid, J., Förstl, H., Kurz, A., Perneczky, R. & Miners, S., 1 Aug 2019, In: *Neurodegenerative Diseases*. 19, 1, p. 43-50 8 p.

**Biochemical Evidence Of Cerebral Hypoperfusion in Dementia: Associated With  $\beta$ -Secretase, Endothelin-1 And Arteriosclerosis**

Taylor, H., MacLachlan, R., Miners, S. & Love, S., 8 Jun 2019, (Unpublished).

**Exploring the putative role of kallikrein-6, calpain-1 and cathepsin-D in the proteolytic degradation of  $\alpha$ -synuclein in multiple system atrophy**

Kiely, A. P., Miners, S., Courteny, R., Strand, C., Love, S. & Holton, J. L., 1 Jun 2019, In: *Neuropathology and Applied Neurobiology*. 45, 4, p. 347-360 14 p.

**Divergence in the activity of the N- and C- catalytic domains of ACE1 - implications for the role of the renin-angiotensin system in Alzheimer's disease**

Al Mulhim, N., Kehoe, P. & Miners, J. S., 24 Apr 2019, In: *Acta Neuropathologica Communications*. 7, 1, p. 57 3 p., 57.

**KIF5A and KLC1 expression in Alzheimer's disease: relationship and genetic influences**

Hares, K. M., Miners, S., Scolding, N., Love, S. & Wilkins, A., 19 Feb 2019, In: *AMRC Open Research*. 1, 22 p., 1.

**Differing associations between A $\beta$  accumulation, hypoperfusion, blood-brain barrier dysfunction and loss of PDGFRB pericyte marker in the precuneus and parietal white matter in Alzheimer's disease**

Miners, J. S., Schulz, I. & Love, S., 1 Jan 2018, In: *Journal of Cerebral Blood Flow and Metabolism*. 38, 1, p. 103-115 13 p.

**VEGFR1 and VEGFR2 in Alzheimer's Disease**

Harris, R., Miners, J. S., Allen, S. & Love, S., 2018, In: *Journal of Alzheimer's Disease*. 61, 2, p. 741-752 12 p.

**Overexpression of kinesin superfamily motor proteins in Alzheimer's Disease**

Hares, K., Miners, S., Cook, A., Rice, C., Scolding, N., Love, S. & Wilkins, A., 7 Nov 2017, In: *Journal of Alzheimer's Disease*. 60, 4, p. 1511-1524 14 p.

**Small vessel disease, neurovascular regulation and cognitive impairment: post-mortem studies reveal a complex relationship, still poorly understood**

Love, S. & Miners, S., 15 Jul 2017, In: *Clinical Science*. 131, 14, p. 1579-1589 11 p.

**Angiotensin-III is Increased in Alzheimer's Disease in Association with Amyloid- $\beta$  and Tau Pathology**

Kehoe, P. G., Hibbs, E., Palmer, L. E. & Miners, J. S., 3 May 2017, In: *Journal of Alzheimer's Disease*. 58, 1, p. 203-214 12 p.

**Clusterin levels are increased in Alzheimer's disease and influence the regional distribution of A $\beta$**

Miners, J. S., Clarke, P. & Love, S., May 2017, In: Brain Pathology. 27, 3, p. 305–313 9 p.

**Endothelin-converting enzymes degrade  $\alpha$ -synuclein and are reduced in dementia with Lewy bodies**

Miners, J. S. & Love, S., 6 Apr 2017, In: Journal of Neurochemistry. 141, 2, p. 275-286 12 p.

**Angiotensin-converting enzyme 2 is reduced in Alzheimer's disease in association with increasing amyloid- $\beta$  and tau pathology**

Kehoe, P. G., Wong, S., Al Mulhim, N. S. K., Palmer, L. E. & Miners, J. S., 25 Nov 2016, In: Alzheimer's Research and Therapy. 8, 1, 10 p., 50.

**Cerebral Hypoperfusion and the Energy Deficit in Alzheimer's Disease**

Love, S. & Miners, J. S., Sept 2016, In: Brain Pathology. 26, 5, p. 607-617 11 p.

**Pathophysiology of hypoperfusion of the precuneus in early Alzheimer's disease**

Miners, J. S., Palmer, J. C. & Love, S., Jul 2016, In: Brain Pathology. 26, 4, p. 533-541 9 p., 12331.

**Cerebrovascular disease in ageing and Alzheimer's disease**

Love, S. & Miners, J. S., May 2016, In: Acta Neuropathologica. 131, 5, p. 645-658 14 p.

**Effects of hypertension and anti-hypertensive treatment on A $\beta$  plaque load, A $\beta$ -synthesising and -degrading enzymes in frontal cortex**

Ashby, E. L., Miners, J. S., Kehoe, P. G. & Love, S., 22 Feb 2016, In: Journal of Alzheimer's Disease. 50, 4, p. 1191-1203 12 p.

**Investigation of A $\beta$  phosphorylated at serine 8 (pA $\beta$ ) in Alzheimer's disease, dementia with Lewy bodies and vascular dementia**

Ashby, E. L., Miners, J. S., Kumar, S., Walter, J., Love, S. & Kehoe, P. G., Jun 2015, In: Neuropathology and Applied Neurobiology. 41, 4, p. 428-44 17 p.

**Post-mortem assessment of hypoperfusion of cerebral cortex in Alzheimer's disease and vascular dementia**

Thomas, T., Miners, S. & Love, S., 15 Feb 2015, In: Brain. 138, 4, p. 1059-1069 11 p.

**White matter hypoperfusion and damage in dementia: post-mortem assessment**

Love, S. & Miners, J. S., Jan 2015, In: Brain Pathology. 25, 1, p. 99-107 9 p.

**Accumulation of  $\alpha$ -synuclein in dementia with Lewy bodies is associated with decline in the  $\alpha$ -synuclein-degrading enzymes kallikrein-6 and calpain-1**

Miners, J., Renfrew, R., Swirski, M. & Love, S., 5 Dec 2014, In: Acta Neuropathologica Communications. 2, 1, p. 164

**A $\beta$  degradation or cerebral perfusion? Divergent effects of multifunctional enzymes: Divergent effects of multifunctional enzymes**

Miners, J. S., Palmer, J. C., Tayler, H., Palmer, L. E., Ashby, E., Kehoe, P. G. & Love, S., 11 Sept 2014, In: Frontiers in Aging Neuroscience. 6, 13 p., 238.

**Reduced vascular endothelial growth factor and capillary density in the occipital cortex in dementia with Lewy bodies**

Miners, S., Moulding, H., de Silva, R. & Love, S., 13 Feb 2014, In: Brain Pathology.

**Differential Changes in A $\beta$ 42 and A $\beta$ 40 with Age**

Miners, J. S., Jones, R. & Love, S., 6 Feb 2014, In: Journal of Alzheimer's Disease.

**Evaluating the relationship between amyloid- $\beta$  and  $\alpha$ -synuclein phosphorylated at Ser129 in dementia with Lewy bodies and Parkinson's disease**

Swirski, M., Miners, J. S., de Silva, R., Lashley, T., Ling, H., Holton, J., Revesz, T. & Love, S., 2014, In: Alzheimer's Research and Therapy. 6, 5-8, p. 77

**BN1 Is Decreased in Sporadic but Not Familial Alzheimer's Disease or in Aging**

Glennon, E. B. C., Whitehouse, I. J., Miners, J. S., Kehoe, P. G., Love, S., Kellett, K. A. B. & Hooper, N. M., 21 Oct 2013, In: PLoS ONE. 8, 10, p. e78806 11 p., 78806.

**Prion protein is decreased in Alzheimer's brain and inversely correlates with BACE1 activity, amyloid- $\beta$  levels and Braak stage**

Whitehouse, I. J., Miners, J. S., Glennon, E. B. C., Kehoe, P. G., Love, S., Kellett, K. A. B. & Hooper, N. M., 5 Apr 2013, In: PLoS ONE. 8, 4, p. e59554 8 p., 59554.

**Genetic variation in MME in relation to neprilysin protein and enzyme activity, A $\beta$  levels, and Alzheimer's disease risk**

Miners, S., van Helmond, Z., Barker, R., Passmore, P. A., Johnston, J. A., Todd, S., McGuinness, B. M., Panza, F., Seripa, D., Solfrizzi, V., Love, S., Prince, J. A. & Kehoe, P. G., 27 Mar 2012, In: International journal of molecular epidemiology and genetics. 3, 1, p. 30-38 9 p.

**Convection-enhanced delivery of neprilysin: A Novel Amyloid- $\beta$ -Degrading Therapeutic Strategy**

Barua, N. U., Miners, J. S., Bienemann, A. S., Wyatt, M. J., Welser, K., Tabor, A. B., Hailes, H. C., Love, S. & Gill, S. S., 2012, In: Journal of Alzheimer's Disease.

**A $\beta$ -Degrading Enzymes: Potential for Treatment of Alzheimer Disease**

Miners, J. S., Barua, N., Kehoe, P. G., Gill, S. & Love, S., Nov 2011, In: Journal of Neuropathology and Experimental Neurology. 70, 11, p. 944 - 959 17 p.

**The influence of tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ) on amyloid- $\beta$  (A $\beta$ )-degrading enzymes in vitro**

Culpan, D., Palmer, J., Miners, J. S., Love, S. & Kehoe, P. G., Nov 2011, In: International journal of molecular epidemiology and genetics. 2, 4, p. 409 - 415 7 p.

**Neprilysin protects against cerebral amyloid angiopathy and A $\beta$ -induced degeneration of cerebrovascular smooth muscle cells**

Miners, J., Kehoe, P. & Love, S., Sept 2011, In: Brain Pathology. 21, 5, p. 594 - 605 12 p.

**Accumulation of insoluble amyloid- $\beta$  in down's syndrome is associated with increased BACE-1 and neprilysin activities**

Miners, J. S., Morris, S., Love, S. & Kehoe, P. G., Jan 2011, In: Journal of Alzheimer's Disease. 23, 1, p. 101 - 108 8 p.

**Oxidative balance in Alzheimer's disease: relationship to APOE, Braak tangle stage, and the concentrations of soluble and insoluble amyloid- $\beta$**

Taylor, H., Fraser, T., Miners, J. S., Kehoe, P. G. & Love, S., Oct 2010, In: Journal of Alzheimer's Disease. 22, 4, p. 1363 - 1373 11 p.

**Changes with age in the activities of  $\beta$ -secretase and the A $\beta$ -degrading enzymes neprilysin, insulin-degrading enzyme and angiotensin-converting enzyme**

Miners, J. S., van Helmond, Z., Kehoe, P. G. & Love, S., Jul 2010, In: Brain Pathology. 20, 4, p. 794 - 802 9 p.

**Higher soluble A $\beta$  concentration in frontal cortex of young adults than in normal elderly or Alzheimer's disease**

Miners, J., van Helmond, Z., Kehoe, P. & Love, S., Jul 2010, In: Brain Pathology. 20, 4, p. 787 - 793 7 p.

**Oligomeric A $\beta$  in Alzheimer's disease: relationship to plaque and tangle pathology, APOE genotype and cerebral amyloid angiopathy**

van Helmond, Z., Miners, J. S., Kehoe, P. G. & Love, S., Mar 2010, In: Brain Pathology. 20, 2, p. 468 - 480 13 p.

#### **Angiotensins in Alzheimer's disease - friend or foe?**

Kehoe, P., Miners, J. & Love, S., Dec 2009, In: Trends in Neurosciences. 32, 12, p. 619 - 628 10 p.

#### **Nepriylsin and insulin-degrading enzyme levels are increased in Alzheimer disease in relation to disease severity**

Miners, J., Baig, S., Tayler, H., Kehoe, P. & Love, S., Aug 2009, In: Journal of Neuropathology and Experimental Neurology. 68, 8, p. 902 - 914 13 p.

#### **Angiotensin-converting enzyme levels and activity in Alzheimer's disease: differences in brain and CSF ACE and association with ACE1 genotypes**

Miners, J., Ashby, E., Baig, S., Harrison, R., Tayler, H., Speedy, E. A., Prince, J., Love, S. & Kehoe, P., Jan 2009, In: American Journal of Translational Research. 1, 2, p. 163 - 177 15 p.

#### **Insights into the pathogenesis and pathogenicity of cerebral amyloid angiopathy**

Love, S., Miners, J., Palmer, J., Chalmers, K. & Kehoe, P., Jan 2009, In: Frontiers in Bioscience. 14, p. 4778 - 4792 15 p.

#### **Abeta-degrading enzymes in Alzheimer's disease**

Miners, J. S., Baig, S., Palmer, J., Palmer, L. E., Kehoe, P. G. & Love, S., Apr 2008, In: Brain Pathology. 18, 2, p. 240-52 13 p.

#### **Angiotensin-converting enzyme (ACE) levels and activity in Alzheimer's disease, and relationship of perivascular ACE-1 to cerebral amyloid angiopathy**

Miners, J., Ashby, E., van Helmond, Z., Chalmers, K., Palmer, L., Love, S. & Kehoe, P., Apr 2008, In: Neuropathology and Applied Neurobiology. 34, 2, p. 181 - 193 13 p.

#### **Angiotensin-converting enzyme (ACE) levels and activity in Alzheimer's disease, and relationship of perivascular ACE-1 to cerebral amyloid angiopathy (Neuropathology and Applied Neurobiology (2008) 34, (181-193))**

Miners, J. S., Ashby, E., Van Helmond, Z., Chalmers, K. A., Palmer, L. E., Love, S. & Kehoe, P. G., Apr 2008, In: Neuropathology and Applied Neurobiology.

#### **Immunocapture-based fluorometric assay for the measurement of insulin-degrading enzyme activity in brain tissue homogenates**

Miners, J., Love, S. & Kehoe, P., Mar 2008, In: Journal of Neuroscience Methods. 169 (1), p. 177 - 181 5 p.

#### **Immunocapture-based fluorometric assay for the measurement of neprilysin-specific enzyme activity in brain tissue homogenates and cerebrospinal fluid**

Miners, J., Verbeek, M., Olde Rikkert, M., Kehoe, P. & Love, S., Jan 2008, In: Journal of Neuroscience Methods. 167 (2), p. 229 - 236 8 p.

#### **Caveolin-1 and -2 and their relationship to cerebral amyloid angiopathy in Alzheimer's disease**

van Helmond, Z., Miners, J., Bednall, E., Chalmers, K., Zhang, Y., Wilcock, G., Love, S. & Kehoe, P., Jun 2007, In: Neuropathology and Applied Neurobiology. 33 (3), p. 317 - 327 11 p.

#### **Decreased Expression and Activity of Neprilysin in Alzheimer Disease Are Associated With Cerebral Amyloid Angiopathy**

Miners, J., van Helmond, Z., Chalmers, K., Wilcock, G., Love, S. & Kehoe, P., Oct 2006, In: Journal of Neuropathology and Experimental Neurology. 65 (10), p. 1012 - 1021 10 p.

#### **Caveolin-1 does not influence cerebrovascular accumulation of Abeta in Alzheimer's disease**

van Helmond, Z., Miners, J., Chalmers, K., Zhang, Y., Wilcock, G., Love, S. & Kehoe, P., 2006, *Unknown*. Vol. 2. p. S544

## **Awards**

## **Projects**

Investigating the relationship and modelling the impact of neuroinflammation on cerebral vascular function in dementia using novel 3D models of cerebral vasculature.

Milner, O. (Principal Investigator), Miners, J. S. (Co-Investigator), Fisher, R. A. (Co-Investigator), Armstrong, J. (Co-Investigator) & Boche, D. (Co-Investigator)  
1/10/22 → 2/04/27

**Mapping cerebrovascular (dys)function in the early stages of Alzheimer's disease**

Miners, J. S. (Principal Investigator)  
1/09/24 → 31/08/27