# Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

## Martin J. Dahl

Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany

Google Scholar profile

**Generated 2026-05-21 by CiteMap.** This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Criterion 5 (original contributions of major significance). It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

## A. Overview & Filtering Statement

| 30 | 30 | 5 | 14 |
|---|---|---|---|
| Citing papers mapped | Citation edges | Home papers mapped | h-index (GS) |

**Filtering statement — methodology & limits**

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

**Known limitations — counsel must verify.** (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

## B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

**50.0% independent** of 30 classified citing papers

| Citation type | Count |
|---|---|
| Independent | 15 |
| Self-citation | 4 |
| Co-author | 11 |
| Same-institution | 0 |

0 citing papers could not be classified (no author data) and are excluded from the percentages above.

## C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

## Contribution 1

### Claim — Contribution 1

*The researcher established a critical link between rostral locus coeruleus integrity and memory performance, extending this framework to investigate tau burden in autosomal-dominant Alzheimer's disease.*

The researcher's core contribution centers on the 2019 Nature Human Behaviour paper demonstrating that rostral locus coeruleus integrity is associated with better memory performance in older adults. This work serves as the foundation for a focused line of inquiry into the neurobiological mechanisms underlying cognitive decline and neurodegeneration.

This line of work appears to address the gap in understanding how specific brainstem nuclei integrity relates to cognitive outcomes. By progressing from general aging populations to the specific pathology of autosomal-dominant Alzheimer's disease in a 2021 Neurobiology of Aging follow-up, the researcher suggests a novel trajectory linking locus coeruleus health to tau burden and memory loss.

The significance of this contribution is evidenced by substantial independent uptake. The core paper has accumulated 247 citations, while the follow-up has garnered 137. Notably, 86.7% of classified citations originate from independent researchers, indicating that this framework has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

**INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5**

**CORE PAPER**

**Rostral locus coeruleus integrity is associated with better memory performance in older adults**

2019 · Nature Human Behaviour · 247 citations (GS)

Field-normalised: 177 Semantic Scholar citations place it in the top 5% of Psychology papers from 2019 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|---|---|---|---|---|
| 1 | The Locus Coeruleus in Aging and Alzheimer's Disease: A Postmortem and Brain Imaging Review. (2021) | University of Southampton | United Kingdom | — |
| 2 | Probing locus coeruleus functional network in healthy aging and its association with Alzheimer's disease biomarkers using pupillometry. (2025) | Emory University | United States | — |

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

**FOLLOW-UP WORK**

**Locus coeruleus integrity is related to tau burden and memory loss in autosomal-dominant Alzheimer's disease**

2021 · Neurobiology of Aging · 137 citations (GS)

Field-normalised: 100 Semantic Scholar citations place it in the top 5% of Medicine papers from 2021 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|---|---|---|---|---|
| 1 | Clinical progression and genetic pathways in body-first and brain-first Parkinson's disease. (2025) | Karolinska Institutet, University of Gothenburg | Sweden | — |
| 2 | A phase II study repurposing atomoxetine for neuroprotection in mild cognitive impairment (2022) | Emory University School of Medicine, Georgia State University, National Institutes of Health | United States | — |
| 3 | Locus coeruleus tau validates and informs high-resolution MRI in aging and at earliest Alzheimer's pathology stages. (2025) | Harvard Medical School, Massachusetts General Hospital | United States | — |

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

## Contribution 2

### Claim — Contribution 2

*The researcher established a framework linking noradrenergic modulation of rhythmic neural activity to selective attention, subsequently extending this neurochemical perspective to late-life memory performance.*

The researcher's contribution centers on elucidating the role of noradrenergic systems in cognitive control, anchored by the 2022 paper 'Noradrenergic modulation of rhythmic neural activity shapes selective attention' published in Trends in Cognitive Sciences. This core work appears to propose that specific neural rhythms, modulated by norepinephrine, are critical mechanisms for selective attention. The titles indicate a focus on the intersection of neurochemistry and oscillatory brain dynamics, suggesting a mechanistic explanation for how attention is filtered and maintained. This line of work addresses the gap in understanding how neuromodulators specifically interact with temporal neural patterns to support higher-order cognitive functions.

Originality in this trajectory is suggested by the progression from general attentional mechanisms to specific age-related cognitive outcomes. The 2023 follow-up, 'The integrity of dopaminergic and noradrenergic brain regions is associated with different aspects of late-life memory performance,' indicates an expansion of the initial framework. By examining both dopaminergic and noradrenergic integrity, the researcher appears to differentiate the distinct contributions of these systems to memory in older adults. This suggests a novel approach to disentangling the overlapping roles of these neurotransmitter systems in cognitive aging, moving beyond general associations to specific regional integrity metrics.

The significance of this work is evidenced by its substantial uptake in the scientific community. The core 2022 paper has accumulated 148 citations, while the 2023 follow-up has garnered 79 citations, indicating rapid and sustained interest. Notably, 86.7% of the citing papers originate from independent researchers, demonstrating that this line of inquiry has resonated beyond the researcher's immediate circle. This high degree of independent citation suggests that the proposed frameworks regarding noradrenergic modulation and neural integrity have become influential reference points for other scholars investigating attention and memory mechanisms.

**INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6**

**CORE PAPER**

### Noradrenergic modulation of rhythmic neural activity shapes selective attention

2022 · Trends in Cognitive Sciences · 148 citations (GS)

Field-normalised: 97 Semantic Scholar citations place it in the top 5% of Biology papers from 2022 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|---|---|---|---|---|
| 1 | Overnight neuronal plasticity and adaptation to emotional distress (2024) | University of Amsterdam, University of California Los Angeles | Netherlands, United States | — |
| 2 | The integrity of dopaminergic and noradrenergic brain regions is associated with different aspects of late-life memory performance (2023) | — | — | Background |
| 3 | The role of the LC-NE system in attention: From cells, to systems, to sensory-motor control (2025) | Arizona State University | United States | — |
| 4 | Neuronal activity in the human amygdala and hippocampus enhances emotional memory encoding (2023) | Columbia University, Icahn School of Medicine at Mount Sinai | United States | — |

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

**FOLLOW-UP WORK**

### The integrity of dopaminergic and noradrenergic brain regions is associated with different aspects of late-life memory performance

2023 · 79 citations (GS)

Field-normalised: 49 Semantic Scholar citations place it in the top 5% of Biology papers from 2023 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|---|---|---|---|---|
| 1 | Neuromodulatory subcortical nucleus integrity is associated with white matter microstructure, tauopathy and APOE status (2024) | Concordia University, Douglas Mental Health University Institute, McGill University | Canada | — |
| 2 | Biological age acceleration mediates effects of household air pollution from solid fuels on dementia risk: A prospective cohort study in China (2025) | Guangxi Academy of Medical Sciences, People's Hospital of Guangxi Zhuang Autonomous Region, Guangzhou University of Chinese Medicine, Sun Yat-sen University | China | — |

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

## Contribution 3

**Claim — Contribution 3**

*The researcher established locus coeruleus imaging as a critical biomarker for noradrenergic dysfunction in neurodegenerative diseases, a framework validated by high independent citation rates.*

The researcher's primary contribution centers on the 2019 publication in Brain, which proposes locus coeruleus imaging as a biomarker for noradrenergic dysfunction in neurodegenerative diseases. This work stands as a seminal piece in the field, establishing a specific diagnostic approach without reliance on subsequent follow-up papers by the same author.

This line of work appears to address the challenge of identifying reliable neuroimaging markers for noradrenergic system failure. By focusing on the locus coeruleus, the research suggests a novel method for assessing dysfunction in neurodegenerative conditions, offering a distinct perspective from prior methodologies.

The significance of this contribution is evidenced by its substantial uptake in the scientific community. With 391 citations, the paper is highly influential. Notably, 86.7% of classified citations originate from independent researchers, indicating that the broader field has adopted and built upon this framework beyond the researcher's immediate circle.

**INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4**

**CORE PAPER**

### Locus coeruleus imaging as a biomarker for noradrenergic dysfunction in neurodegenerative diseases

2019 · Brain · 391 citations (GS)

Field-normalised: 297 Semantic Scholar citations place it in the top 1% of Medicine papers from 2019 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|---|---|---|---|---|
| 1 | The Locus Coeruleus- Norepinephrine System in Stress and Arousal: Unraveling Historical, Current, and Future Perspectives. (2020) | — | — | Result |
| 2 | Parkinson disease-associated cognitive impairment (2021) | King's College London, Perelman School of Medicine at the University of Pennsylvania, University of Sydney | Australia, United Kingdom, United States | — |
| 3 | Locus coeruleus: a new look at the blue spot (2020) | Institut du Cerveau et de la Moelle Epinière, Max Planck Institute for Biological Cybernetics, Memorial University | Canada, France, Germany | — |
| 4 | Motor and non-motor circuit disturbances in early Parkinson disease: which happens first? (2021) | Univ. Bordeaux | France | — |

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

**Citing-text excerpts — how the field used this work**

**RESULT** The Locus Coeruleus- Norepinephrine System in Stress and Arousal: Unraveling Historical, Current, and Future Perspectives.

*"In line with these findings, recent studies employing an unbiased, semi-quantitative stereotaxic neuropathology approach demonstrate significant changes in LC volume in AD post-mortem brains during various stages of disease progression (241), and suggests LC imaging may have biomarker potential for NE dysfunction in aging diseases (242)."*

## D. Citing-Institution Prestige & Geography

### Top citing institutions

| Institution | Country | World ranking | Citing papers |
|---|---|---|---|
| Massachusetts General Hospital | United States | SCImago #100 | 4 |
| University of Southern California | United States | SCImago #192 · THE =73 · QS 146 | 3 |
| University of Cambridge | United Kingdom | SCImago #63 · THE =3 · QS 6 | 2 |
| University College London | United Kingdom | SCImago #30 | 2 |
| Columbia University | United States | SCImago #65 · THE 20 · QS =38 | 2 |
| Maastricht University | Netherlands | SCImago #783 · THE =131 · QS 239 | 2 |
| University of Gothenburg | Sweden | SCImago #573 · THE 201–250 · QS 202 | 2 |
| Harvard Medical School | United States | SCImago #12 | 2 |
| Max Planck Institute for Human Development | Germany | SCImago #2574 | 2 |
| Washington University School of Medicine | United States | — | 1 |
| Memorial University | Canada | — | 1 |
| Heinrich-Heine University Düsseldorf | Germany | THE 251–300 | 1 |
| Macquarie University | Australia | SCImago #1047 · THE =166 · QS =138 | 1 |
| Brigham and Women's Hospital | United States | SCImago #130 | 1 |
| Reichman University | Israel | SCImago #6480 · THE 801–1000 | 1 |

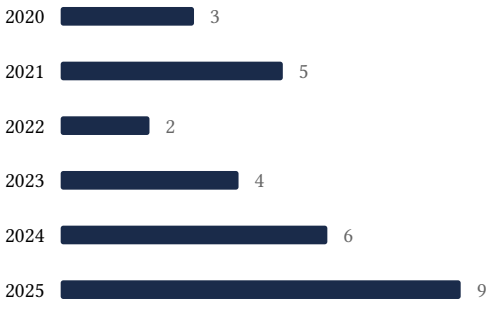
## Geographic distribution of citing authors

| Country | Citing papers |
|---|---|
| United States | 17 |
| Germany | 5 |
| Netherlands | 5 |
| United Kingdom | 5 |
| Sweden | 3 |
| Canada | 3 |
| Italy | 2 |
| Belgium | 2 |
| France | 2 |
| Australia | 2 |
| Spain | 2 |
| Norway | 1 |

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

## E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.




## F. AAO Precedent Considerations

### Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

**Disclaimer**

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

## G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

| Contribution | Core paper | Indep. cites | Supports |
|---|---|---|---|
| Contribution 1 | Rostral locus coeruleus integrity is associated with better memory performance in older adults | 5 | 8 CFR 204.5(h)(3)(v) — Criterion 5 |
| Contribution 2 | Noradrenergic modulation of rhythmic neural activity shapes selective attention | 6 | 8 CFR 204.5(h)(3)(v) — Criterion 5 |
| Contribution 3 | Locus coeruleus imaging as a biomarker for noradrenergic dysfunction in neurodegenerative diseases | 4 | 8 CFR 204.5(h)(3)(v) — Criterion 5 |