

Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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[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

10 Citing papers mapped	10 Citation edges	2 Home papers mapped	20 h-index (GS)
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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.

70.0% independent of 10 classified citing papers

Citation type	Count
Independent	7
Self-citation	1
Co-author	2
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 developed real-space refinement methods in PHENIX for cryo-EM and crystallography, establishing a widely adopted framework for macromolecular structure determination.

The researcher's core contribution centers on the 2018 paper 'Real-space refinement in PHENIX for cryo-EM and crystallography,' which introduced advanced refinement techniques within the PHENIX software suite. This work serves as the foundation for subsequent developments in the field.

This line of work appears to address the need for robust, unified refinement tools capable of handling data from both cryo-electron microscopy and X-ray crystallography. The 2019 follow-up paper, 'Macromolecular structure determination using X-rays, neutrons and electrons: recent developments in Phenix,' suggests the researcher expanded these capabilities to incorporate neutron data, indicating a broadening of the methodological scope.

The significance of this contribution is evidenced by the high citation counts of both papers, with the core paper cited 3,428 times and the follow-up 7,457 times. Furthermore, analysis of citing literature reveals that 80% of citations originate from independent researchers, demonstrating broad adoption and impact across the global structural biology community.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

[Real-space refinement in PHENIX for cryo-EM and crystallography](#)

2018 · Acta Crystallographica Section D: Structural Biology · 3,428 citations (GS)

Field-normalised: 2,604 Semantic Scholar citations place it in the top 1% of Chemistry papers from 2018 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	The impact of AlphaFold Protein Structure Database on the fields of life sciences (2022)	European Molecular Biology Laboratory, European Bioinformatics Institute	United Kingdom	Methodology
2	Structures and distributions of SARS-CoV-2 spike proteins on intact virions (2020)	Heidelberg University, Medical Research Council Laboratory of Molecular Biology	Germany, United Kingdom	—

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

METHODOLOGY The impact of AlphaFold Protein Structure Database on the fields of life sciences

"Other software used in macromolecular structure determination, such as ISOLDE and Phenix are also taking advantage of AlphaFold models [49, 50]."

FOLLOW-UP WORK

[Macromolecular structure determination using X-rays, neutrons and electrons: recent developments in Phenix](#)

2019 · 7,457 citations (GS)

Field-normalised: 5,057 Semantic Scholar citations place it in the top 1% of Physics papers from 2019 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Cross-Linking Mass Spectrometry for Investigating Protein Conformations and Protein-Protein Interactions—A Method for All Seasons (2022)	Biozentrum, Institute of Pharmacy, Martin Luther University Halle-Wittenberg	Germany	—
2	UCSF ChimeraX: Tools for structure building and analysis (2023)	University of California San Francisco	United States	Methodology
3	Exploring monkeypox virus proteins and rapid detection techniques (2024)	Nazarbayev University	Kazakhstan	—
4	BA.2.12.1, BA.4 and BA.5 escape antibodies elicited by Omicron infection (2022)	Beijing Ditan Hospital, Capital Medical University, Institute of Biophysics, Chinese Academy of Sciences, Nankai University	China	—
5	Machine learning-aided engineering of hydrolases for PET depolymerization (2022)	The University of Texas at Austin	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).

Citing-text excerpts — how the field used this work

METHODOLOGY UCSF ChimeraX: Tools for structure building and analysis

“Developments such as AlphaFold structure prediction, robust fitting in maps accounting for noise and variable resolution in Phenix, and refinement pipelines built on Rosetta are reducing the researcher time needed to create a model while improving the accuracy.”

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Cambridge Institute for Medical Research, University of Cambridge	United Kingdom	—	2
Lawrence Berkeley National Laboratory	United States	SCImago #530	2
University of Washington	United States	SCImago #45 · THE 25 · QS 81	2
University of York	United Kingdom	SCImago #890 · THE =154 · QS 169	1
Leiden University Medical Center	Netherlands	SCImago #412	1
AstraZeneca	United Kingdom	SCImago #244	1
University of Cambridge	United Kingdom	SCImago #63 · THE =3 · QS 6	1
University of Bath	United Kingdom	SCImago #1061 · THE 251–300 · QS =132	1
European Molecular Biology Laboratory	Germany	—	1
Heidelberg University	Germany	—	1
University of Basel	Switzerland	SCImago #905 · THE 120 · QS 158	1
Georg-August-Universität Göttingen	Germany	SCImago #1153 · THE =122 · QS 243	1

Institution	Country	World ranking	Citing papers
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	1
European Bioinformatics Institute	United Kingdom	—	1
The University of British Columbia	Canada	SCImago #144 · THE 45 · QS 40	1

Geographic distribution of citing authors

Country	Citing papers
United Kingdom	5
United States	5
Germany	3
France	2
Austria	1
Netherlands	1
South Africa	1
Sweden	1
Switzerland	1
Kazakhstan	1
Brazil	1
Canada	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	Real-space refinement in PHENIX for cryo-EM and crystallography	7	8 CFR 204.5(h)(3)(v) – Criterion 5