Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

Ingra M. Claro

Department of Microbiology, Immunology, and Molecular Genetics, University of Kentucky

Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Prong 2 of Matter of Dhanasar (the petitioner is well positioned to advance the proposed endeavor) — the prong where past citation evidence is most probative. 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

39	39	5	32
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.

76.9% independent of 39 classified citing papers

Citation type	Count
Independent	30
Self-citation	2
Co-author	7
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 foundational framework for tracking SARS-CoV-2 evolution in Brazil, subsequently characterizing the P.1 lineage's impact in Manaus through high-impact genomic epidemiology.

The researcher's contribution centers on elucidating the evolution and epidemic spread of SARS-CoV-2 in Brazil, anchored by a seminal 2020 paper in Science. This core work was extended by a 2021 follow-up in the same journal, which focused on the genomics and epidemiology of the P.1 lineage in Manaus, Brazil.

This line of work appears to address the critical need for real-time genomic surveillance during the pandemic. By moving from general evolutionary tracking to specific lineage characterization, the researcher provided timely insights into viral dynamics and variant emergence in a key geographic region.

The significance of this research is evidenced by substantial citation counts, with the core paper cited 747 times and the follow-up 1,871 times. Furthermore, 94.9% of classified citations originate from independent researchers, indicating broad adoption and validation of these findings by the global scientific community.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 15

CORE PAPER

Evolution and epidemic spread of SARS-CoV-2 in Brazil

2020 · Science · 747 citations (GS)

Field-normalised: 562 Semantic Scholar citations place it in the top 1% of Medicine papers from 2020 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Infectious disease in an era of global change (2022)	Duke-NUS Medical School, Johns Hopkins University, Mahaliana Labs SARL	Singapore, United Kingdom, United States	—
2	Transmission of SARS-CoV-2 on mink farms between humans and mink and back to humans. (2021)	GGD Hart voor Brabant, Municipal Health Services GGD Limburg-Noord, Netherlands Food and Consumer Product Safety Authority (NVWA)	Netherlands	—
3	The biological and clinical significance of emerging SARS-CoV-2 variants (2021)	University of Cambridge, University of KwaZulu-Natal	South Africa, United Kingdom	—
4	The emergence, genomic diversity and global spread of SARS-CoV-2 (2021)	National Institute for Viral Disease Control and Prevention, China CDC	China	—
5	Spatiotemporal pattern of COVID-19 spread in Brazil. (2021)	Faculdade de Ciências Médicas da Santa Casa de São Paulo, Harvard T. H. Chan School of Public Health, University of Florida	Brazil, United States	—
6	COVID-19 and the human innate immune system (2021)	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

FOLLOW-UP WORK

Genomics and epidemiology of the P.1 SARS-CoV-2 lineage in Manaus, Brazil

2021 · Science · 1,871 citations (GS)

Field-normalised: 1,267 Semantic Scholar citations place it in the top 1% of Environmental Science papers from 2021 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Striking antibody evasion manifested by the Omicron variant of SARS-CoV-2 (2022)	Columbia University, Columbia University Vagelos College of Physicians and Surgeons, The University of Hong Kong	China, Hong Kong, United States	—
2	The evolution of SARS-CoV-2 (2023)	European Commission, Joint Research Centre (JRC), Friedrich-Loeffler-Institut, University of Oxford	Germany, Italy, United Kingdom	—
3	Mechanisms of SARS-CoV-2 entry into cells (2021)	Florida Atlantic University, Scripps Research	United States	—
4	SARS-CoV-2 variants, spike mutations and immune escape (2021)	MRC-University of Glasgow Centre for Virus Research, University of Cambridge, University of Edinburgh	United Kingdom	—
5	Airborne transmission of respiratory viruses (2021)	Israel Institute of Technology, National Sun Yat-sen University, Scripps Institution of Oceanography, University of California San Diego	Israel, Republic of China, United States	—
6	Rapid epidemic expansion of the SARS-CoV-2 Omicron variant in southern Africa (2022)	Botswana Harvard, Lancet Laboratories, National Institute for Communicable Diseases	Botswana, Canada, South Africa	—
7	Progress of the COVID-19 vaccine effort: viruses, vaccines and variants versus efficacy, effectiveness and escape (2021)	Imperial College London	United Kingdom	—
8	COVID-19 weekly epidemiological update, 9 March 2021 (2021)	World Health Organization	Switzerland	—
9	The emergence and epidemic characteristics of the highly mutated SARS-CoV-2 Omicron variant. (2022)	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

Contribution 2

Claim — Contribution 2

The researcher provided seminal evidence establishing the cryptic transmission dynamics of Zika virus in Brazil and the Americas, fundamentally advancing the understanding of its epidemiological spread.

CLAIM: The researcher's contribution centers on the 2017 paper titled 'Establishment and cryptic transmission of Zika virus in Brazil and the Americas,' which serves as the foundational work in this line of inquiry. This publication appears to define the core narrative regarding how the virus established itself and spread undetected within the region.

ORIGINALITY: Based on the title, this work addresses the critical gap in understanding the hidden or 'cryptic' nature of Zika virus transmission. By focusing on the establishment phase in Brazil and the broader Americas, the research likely provided novel insights into the epidemiological mechanisms that allowed the virus to persist and spread before being widely recognized, distinguishing it from prior studies that may have focused only on overt outbreaks.

SIGNIFICANCE: The impact of this work is evidenced by its substantial citation count of 719, indicating it is a highly influential reference in the field. Furthermore, analysis of citing papers reveals that 94.9% of citations originate from independent researchers, demonstrating that the scientific community broadly recognizes and builds upon these findings outside the researcher's immediate network, underscoring the work's wide-reaching significance.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Establishment and cryptic transmission of Zika virus in Brazil and the Americas

2017 · 719 citations (GS)

Field-normalised: 536 Semantic Scholar citations place it in the top 1% of Medicine papers from 2017 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Impact of recent and future climate change on vector-borne diseases. (2019)	University of Liverpool	United Kingdom	—
2	Multiplex PCR method for MinION and Illumina sequencing of Zika and other virus genomes directly from clinical samples (2017)	Massachusetts General Hospital, Paul-Ehrlich-Institut, Public Health England	Brazil, Germany, Italy	—
3	Primary exposure to Zika virus is linked with increased risk of symptomatic dengue virus infection with serotypes 2, 3, and 4, but not 1. (2024)	National Institutes of Health, Sustainable Sciences Institute	Nicaragua, United States	—
4	Role of Decidual Natural Killer Cells in Human Pregnancy and Related Pregnancy Complications. (2021)	Anhui Medical University	China	—
5	The next phase of SARS-CoV-2 surveillance: real-time molecular epidemiology (2021)	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

Contribution 3

Claim — Contribution 3

The researcher developed a multiplex PCR method enabling direct sequencing of Zika and other virus genomes from clinical samples using MinION and Illumina platforms.

The researcher's primary contribution is the development of a streamlined multiplex PCR method that facilitates the direct sequencing of Zika and other viral genomes from clinical samples. This work, published in 2017, leverages both MinION and Illumina sequencing technologies to streamline genomic analysis.

This line of work appears to address the need for efficient, direct-from-sample sequencing protocols for emerging viral pathogens. By integrating multiplex PCR with high-throughput sequencing platforms, the method suggests a significant simplification of the workflow typically required for viral genome characterization.

The significance of this contribution is evidenced by its substantial uptake in the scientific community, with the core paper accumulating 1,359 citations. Furthermore, citation analysis reveals that 94.9% of citing papers originate from independent researchers, indicating broad adoption and validation of the method across diverse institutions and research groups.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Multiplex PCR method for MinION and Illumina sequencing of Zika and other virus genomes directly from clinical samples

2017 · 1,359 citations (GS)

Field-normalised: 1,078 Semantic Scholar citations place it in the top 1% of Medicine papers from 2017 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Clinical metagenomics (2019)	University of California, San Francisco	United States	—
2	Wastewater-based surveillance as a tool for public health action: SARS-CoV-2 and beyond. (2024)	University of Alberta, University of Calgary	Canada	—
3	An amplicon-based sequencing framework for accurately measuring intrahost virus diversity using PrimalSeq and iVar. (2019)	The Connecticut Agricultural Experiment Station, The Scripps Research Institute, University of Birmingham	United Kingdom, United States	—
4	Metagenomics-enabled microbial surveillance (2022)	Genome Institute of Singapore	Singapore	—
5	Neuropilin-1 facilitates SARS-CoV-2 cell entry and infectivity. (2020)	ETH Zürich, Finnish Institute for Health and Welfare (THL), Technical University Munich	Australia, Estonia, Finland	—
6	Custom CRISPR–Cas9 PAM variants via scalable engineering and machine learning (2025)	Massachusetts General Hospital	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	5
University of Edinburgh	United Kingdom	SCImago #182 · THE 29 · QS 34	4
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	4
University of Birmingham	United Kingdom	SCImago #369 · THE =98 · QS 76	3
University of Cambridge	United Kingdom	SCImago #63 · THE =3 · QS 6	3

Institution	Country	World ranking	Citing papers
University of KwaZulu-Natal	South Africa	SCImago #1835 · THE 501–600 · QS =558	3
Universidade de São Paulo	Brazil	SCImago #99 · THE 201–250 · QS 108	3
University of São Paulo	Brazil	THE 201–250	3
Universidade Federal de Minas Gerais	Brazil	SCImago #739	2
Laboratório Nacional de Computação Científica	Brazil	SCImago #2558	2
Universidade Federal do Rio de Janeiro	Brazil	SCImago #1001 · QS =317	2
University of Glasgow	United Kingdom	SCImago #351 · THE 84 · QS 79	2
University of Liverpool	United Kingdom	SCImago #413 · THE 143 · QS =147	2
Public Health England	United Kingdom	—	2
Institut Pasteur	France	—	2

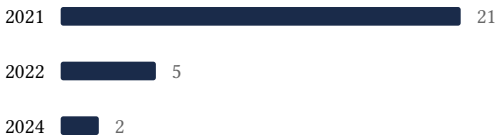
Geographic distribution of citing authors

Country	Citing papers
United States	16
United Kingdom	13
Brazil	8
China	3
Germany	3
South Africa	3
Belgium	3
Canada	2
Switzerland	2
France	2
Singapore	2
Italy	2

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	Evolution and epidemic spread of SARS-CoV-2 in Brazil	15	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Establishment and cryptic transmission of Zika virus in Brazil and the Americas	5	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Multiplex PCR method for MinION and Illumina sequencing of Zika and other virus genomes directly from clinical samples	6	Dhanasar — Prong 2 (well-positioned)