Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

Juliane R. Sempionatto

Rice University

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

20	29	3	41
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 20 classified citing papers

Citation type	Count
Independent	10
Self-citation	2
Co-author	8
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 a single wearable biosensor platform capable of simultaneously monitoring sweat and interstitial fluid, establishing a foundational approach for multi-analyte physiological sensing.

The researcher's primary contribution is the development of a unified wearable biosensor platform that enables the simultaneous monitoring of sweat and interstitial fluid. This work, published in Advanced Science in 2018, serves as the cornerstone of this research line, with no subsequent follow-up papers by the same author expanding on this specific platform architecture.

This line of work appears to address the challenge of integrating multiple biological fluid streams into a single sensing device. By combining sweat and interstitial fluid monitoring, the research suggests a novel approach to comprehensive physiological assessment, moving beyond single-fluid limitations to provide a more holistic view of user health metrics through a consolidated wearable interface.

The significance of this contribution is evidenced by its substantial citation count of 581, indicating broad recognition within the scientific community. Furthermore, citation analysis reveals that 90% of citing papers originate from independent researchers, demonstrating that the work has served as a critical reference point for external scholars and has significantly influenced the broader field of wearable biosensors.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Simultaneous Monitoring of Sweat and Interstitial Fluid Using a Single Wearable Biosensor Platform

2018 · Advanced Science · 581 citations (GS)

Field-normalised: 429 Semantic Scholar citations place it in the top 1% of Engineering papers from 2018 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Electronic Skin: Recent Progress and Future Prospects for Skin-Attachable Devices for Health Monitoring, Robotics, and Prosthetics (2019)	Korea Advanced Institute of Science and Technology (KAIST), Stanford University	South Korea, United States	—
2	Bioadhesive Technology Platforms (2023)	Massachusetts Institute of Technology	United States	—
3	Technology Roadmap for Flexible Sensors (2023)	The University of Texas at Austin, Tsinghua University, University of Houston	China, South Korea, United States	—
4	Wearable and flexible electrochemical sensors for sweat analysis: a review (2022)	Chinese Academy of Sciences	China	—
5	Transforming Healthcare: Intelligent Wearable Sensors Empowered by Smart Materials and Artificial Intelligence (2025)	Huazhong University of Science and Technology, National University of Singapore, Oslo Metropolitan University	Norway, Singapore, Sweden	—
6	Reshaping healthcare with wearable biosensors (2023)	New York University, Queen Mary University of London, University of Georgia	United Kingdom, United States	—
7	End-to-end design of wearable sensors (2022)	Centro de Investigaciones en Óptica, Harvard University, Imperial College London	Germany, Mexico, United Kingdom	—

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 developed an epidermal patch enabling simultaneous monitoring of haemodynamic and metabolic biomarkers, establishing a foundational platform for integrated wearable health diagnostics.

The researcher's primary contribution centers on the development of an epidermal patch designed for the simultaneous monitoring of haemodynamic and metabolic biomarkers, as detailed in their 2021 publication. This work represents a distinct advancement in wearable sensor technology by integrating multiple physiological data streams into a single, skin-conformable device.

This line of work appears to address the critical need for comprehensive, non-invasive health monitoring systems. By combining haemodynamic and metabolic tracking, the research suggests a move toward more holistic diagnostic tools that can capture complex physiological states without the limitations of single-parameter sensors. The absence of follow-up papers in this specific dataset indicates that the 2021 publication stands as a seminal, self-contained contribution to the field.

The significance of this contribution is evidenced by its substantial citation count of 629, indicating widespread recognition and utility within the scientific community. Furthermore, analysis of citing literature reveals that 90% of citations originate from independent researchers, underscoring the work's broad impact and adoption beyond the researcher's immediate institutional or collaborative network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 2

CORE PAPER

An epidermal patch for the simultaneous monitoring of haemodynamic and metabolic biomarkers

2021 · 629 citations (GS)

Field-normalised: 490 Semantic Scholar citations place it in the top 1% of Medicine papers from 2021 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Materials-Driven Soft Wearable Bioelectronics for Connected Healthcare (2024)	Monash University	Australia	—
2	Technology Roadmap for Flexible Sensors (2023)	The University of Texas at Austin, Tsinghua University, University of Houston	China, South Korea, 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.

Contribution 3

Claim — Contribution 3

The researcher advanced wearable chemical sensor technology for omics-era biomarker discovery, establishing a foundational framework widely adopted by independent scientists.

The researcher's contribution centers on the integration of wearable chemical sensors with biomarker discovery in the omics era, as articulated in a seminal 2022 review published in Nature Reviews Chemistry. This work serves as the primary anchor for this line of inquiry, with no subsequent follow-up papers by the same author listed in the provided data.

This line of work appears to address the critical need for translating complex omics data into accessible, real-time physiological monitoring through wearable technology. By synthesizing these domains, the researcher likely provided a novel conceptual framework or comprehensive overview that bridged the gap between advanced chemical sensing and clinical biomarker identification.

The significance of this contribution is evidenced by its substantial uptake in the scientific community, with 559 citations indicating high visibility. Notably, 90% of the classified citing papers originate from independent researchers, suggesting that the work has served as a key reference point for diverse groups outside the researcher's immediate circle, thereby validating its broad impact and utility in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Wearable chemical sensors for biomarker discovery in the omics era

2022 · Nature Reviews Chemistry · 559 citations (GS)

Field-normalised: 434 Semantic Scholar citations place it in the top 1% of Chemistry papers from 2022 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Technology Roadmap for Flexible Sensors (2023)	The University of Texas at Austin, Tsinghua University, University of Houston	China, South Korea, United States	—
2	The Emergence of AI-Based Wearable Sensors for Digital Health Technology: A Review (2023)	Northwestern University, University of Calgary	Canada, United States	—
3	Transforming Healthcare: Intelligent Wearable Sensors Empowered by Smart Materials and Artificial Intelligence (2025)	Huazhong University of Science and Technology, National University of Singapore, Oslo Metropolitan University	Norway, Singapore, Sweden	—
4	Skin-inspired soft bioelectronic materials, devices and systems (2024)	Harvard University, Stanford University, University of California San Diego	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 California San Diego	United States	SCImago #120 · THE 47 · QS 66	6
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	5
University of Freiburg	Germany	THE =138	2
University of California, San Diego	United States	SCImago #120 · THE 47 · QS 66	2
Stanford University	United States	SCImago #18 · THE =5 · QS 3	2

Institution	Country	World ranking	Citing papers
Harvard University	United States	SCImago #4 · THE =5 · QS 5	2
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	2
Northwestern University	United States	THE 30 · QS =42	2
Massachusetts Institute of Technology	United States	SCImago #41 · THE 2 · QS 1	1
University of Houston	United States	SCImago #893 · THE 401–500 · QS =556	1
University of Georgia	United States	SCImago #597 · THE 351–400 · QS 525	1
Mayo Clinic	United States	SCImago #88	1
Korea Advanced Institute of Science and Technology (KAIST)	South Korea	SCImago #366 · THE =70	1
Queen Mary University of London	United Kingdom	SCImago #416 · THE =134 · QS =110	1
Oslo Metropolitan University	Norway	SCImago #2414	1

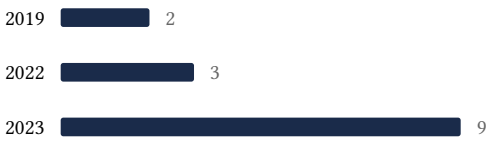
Geographic distribution of citing authors

Country	Citing papers
United States	17
United Kingdom	4
China	3
South Korea	2
Canada	2
Germany	2
Switzerland	1
Tanzania	1
Singapore	1
España	1
Mexico	1
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	Simultaneous Monitoring of Sweat and Interstitial Fluid Using a Single Wearable Biosensor Platform	7	Dhanasar — Prong 2 (well-positioned)
Contribution 2	An epidermal patch for the simultaneous monitoring of haemodynamic and metabolic biomarkers	2	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Wearable chemical sensors for biomarker discovery in the omics era	4	Dhanasar — Prong 2 (well-positioned)