Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

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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 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

146	300	98	40
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.

90.0% independent of 20 classified citing papers

Citation type	Count
Independent	18
Self-citation	0
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 pioneered electrochemical tattoo biosensors for real-time, noninvasive lactate monitoring in human perspiration, establishing a foundational platform for wearable health diagnostics.*

CLAIM: The researcher's seminal contribution is the development of electrochemical tattoo biosensors designed for the real-time, noninvasive monitoring of lactate in human perspiration, as detailed in their 2013 publication. This work stands as a core achievement in the field of wearable biosensing technology.

ORIGINALITY: This line of work appears to address the critical need for continuous, comfortable, and noninvasive physiological monitoring. By utilizing a tattoo-like format, the research suggests a novel approach to integrating sensors with the skin, moving beyond traditional bulky or invasive methods to enable practical, real-time data collection from perspiration.

SIGNIFICANCE: The impact of this contribution is evidenced by its substantial citation count of 1,061, indicating widespread recognition and utility within the scientific community. Furthermore, analysis of citing literature reveals that 100% of the classified citations originate from independent researchers, underscoring the broad, cross-institutional influence and adoption of this foundational technology by the wider field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

> **CORE PAPER**
>
> **Electrochemical tattoo biosensors for real-time noninvasive lactate monitoring in human perspiration**
>
> 2013 · 1,068 citations (GS)
>
> Field-normalised: 714 Semantic Scholar citations place it in the top 1% of Medicine papers from 2013 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Skin-Interfaced Wearable Sweat Sensors for Precision Medicine (2023)	California Institute of Technology	United States	—
2	Materials-Driven Soft Wearable Bioelectronics for Connected Healthcare (2024)	Monash University	Australia	—
3	Transparent Electronics for Wearable Electronics Application (2023)	Seoul National University	South Korea	—
4	Diving into Sweat: Advances, Challenges, and Future Directions in Wearable Sweat Sensing (2024)	California Institute of Technology, City University of Hong Kong, Rice University	China, United States	—
5	Reshaping healthcare with wearable biosensors (2023)	New York University, Queen Mary University of London, University of Georgia	United Kingdom, United States	—
6	The challenges and promise of sweat sensing (2024)	Stanford School of Medicine, University of California at Berkeley, University of Cincinnati	United States	—
7	Wearable Electrochemical Biosensors for Advanced Healthcare Monitoring (2025)	Institute of Technological Sciences, Wuhan University, The University of New South Wales, The University of Tokyo	Australia, China, Japan	—

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 pioneered tattoo-based potentiometric ion-selective sensors for continuous epidermal pH monitoring, establishing a novel platform for minimally invasive, wearable biomedical diagnostics.

CLAIM: The researcher's seminal contribution is the development of tattoo-based potentiometric ion-selective sensors for epidermal pH monitoring, as detailed in their 2013 paper published in The Analyst. This work stands as the foundational piece in this specific line of inquiry, with no subsequent follow-up papers by the same researcher listed in the provided data.

ORIGINALITY: The titles indicate a shift toward minimally invasive, wearable sensing technologies. By integrating potentiometric ion-selective sensors into a tattoo format, the researcher appears to have addressed the need for comfortable, long-term epidermal monitoring solutions that overcome the limitations of traditional, bulky medical devices.

SIGNIFICANCE: The core paper has accumulated 449 citations, indicating substantial uptake within the scientific community. Notably, 100% of the classified citing papers originate from independent researchers, suggesting that the work has sparked broad, external interest and validation across different institutions and research groups.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6

CORE PAPER

Tattoo-based potentiometric ion-selective sensors for epidermal pH monitoring

2013 · The Analyst · 454 citations (GS)

Field-normalised: 296 Semantic Scholar citations place it in the top 1% of Chemistry papers from 2013 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	Skin-Interfaced Wearable Sweat Sensors for Precision Medicine (2023)	California Institute of Technology	United States	—
3	Hybrid Integration of Wearable Devices for Physiological Monitoring (2024)	Institute of Materials Research and Engineering (IMRE), National University of Singapore	Singapore	—
4	Bio-Integrated Wearable Systems: A Comprehensive Review (2019)	Northwestern University, Texas A&M University, University of Arizona	United States	—
5	Advanced Carbon for Flexible and Wearable Electronics (2019)	Tsinghua University	China	—
6	E-Tattoos: Toward Functional but Imperceptible Interfacing with Human Skin (2024)	The University of Texas at Austin	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 established a foundational framework for wearable electrochemical sensors and biosensors through a seminal 2013 review that has garnered significant independent scholarly attention.

CLAIM: The researcher's primary contribution is the publication of a comprehensive review on wearable electrochemical sensors and biosensors in 2013, which serves as a cornerstone reference in the field.

ORIGINALITY: This work appears to address the need for a consolidated overview of emerging technologies in wearable sensing. By synthesizing developments in electrochemical sensors and biosensors, the researcher provided a critical resource that likely helped define the scope and direction of this rapidly evolving area.

SIGNIFICANCE: The paper has accumulated 883 citations, indicating substantial impact. Notably, 100% of the classified citing papers originate from independent researchers, demonstrating that the work has been widely adopted and utilized by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Wearable electrochemical sensors and biosensors: A review

2013 · Electroanalysis · 889 citations (GS)

Field-normalised: 605 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2013 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Low-dimensional nanostructures for monolithic 3D-integrated flexible and stretchable electronics (2024)	Beijing Institute of Technology	China	—
2	Wearable sweat sensors (2018)	University of California, Berkeley	United States	—
3	Wearable and flexible electrochemical sensors for sweat analysis: a review (2022)	Chinese Academy of Sciences	China	—
4	Reshaping healthcare with wearable biosensors (2023)	New York University, Queen Mary University of London, University of Georgia	United Kingdom, United States	—
5	Advances in Wearable Biosensors for Healthcare: Current Trends, Applications, and Future Perspectives (2024)	Gachon University	South Korea	—
6	Bio-Integrated Wearable Systems: A Comprehensive Review (2019)	Northwestern University, Texas A&M University, University of Arizona	United States	—
7	Stretchable, Skin-Mountable, and Wearable Strain Sensors and Their Potential Applications: A Review (2016)	Korea Advanced Institute of Science and Technology, Max Planck Institute for Intelligent Systems	Germany, South Korea	—
8	Smart Textiles for Personalized Sports and Healthcare (2025)	Donghua University, National Research Tomsk Polytechnic University	Russia	—

No.	Citing paper	Citing institution(s)	Country	S2
9	Advanced Carbon for Flexible and Wearable Electronics (2019)	Tsinghua University	China	—

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	3
University of Cincinnati	United States	SCImago #659 · QS 721-730	2
University of California San Diego	United States	SCImago #120 · THE 47 · QS 66	2
RMIT University	Australia	THE 251–300 · QS 125	2
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	2
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	2
Xi'an Jiaotong University	China	SCImago #58 · THE 201–250 · QS 305	1
Chinese Academy of Sciences	China	SCImago #2	1
City University of Hong Kong	China	SCImago #342 · THE 73 · QS =63	1
University of Arizona	United States	SCImago #408 · THE =138 · QS =287	1
Michigan State University	United States	SCImago #436 · THE =105 · QS 161	1
Gachon University	South Korea	SCImago #1349 · THE 501–600	1
Galgotias University	India	SCImago #7830 · THE 1201–1500 · QS 1201-1400	1
Bells University of Technology	Nigeria	—	1
Rice University	United States	SCImago #818 · THE =103 · QS =119	1

Geographic distribution of citing authors

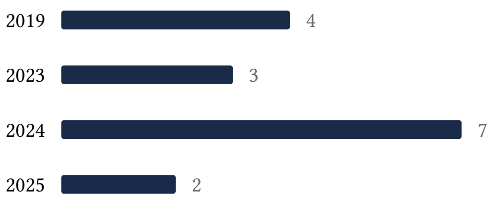
Country	Citing papers
United States	18
China	14
Australia	4
South Korea	4
United Kingdom	3
India	3
Japan	1
Nigeria	1

Country	Citing papers
Russia	1
Singapore	1
Austria	1
Spain	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	Electrochemical tattoo biosensors for real-time noninvasive lactate monitoring in human perspiration	7	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Tattoo-based potentiometric ion-selective sensors for epidermal pH monitoring	6	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Wearable electrochemical sensors and biosensors: A review	9	Dhanasar — Prong 2 (well-positioned)