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

16	20	3	27
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.

62.5% independent of 16 classified citing papers

Citation type	Count
Independent	10
Self-citation	0
Co-author	6
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 an epidermal patch enabling simultaneous monitoring of haemodynamic and metabolic biomarkers, a seminal contribution evidenced by 630 citations and 100% independent uptake.

The researcher's primary contribution is the development of an epidermal patch designed for the simultaneous monitoring of haemodynamic and metabolic biomarkers, as detailed in their 2021 publication. This work stands as a singular, foundational achievement in their portfolio, with no subsequent follow-up papers listed to extend or modify this specific technological approach.

This line of work appears to address the challenge of integrating multiple physiological monitoring capabilities into a single, non-invasive wearable device. By combining haemodynamic and metabolic tracking, the research suggests a novel approach to comprehensive health surveillance, moving beyond single-parameter sensors to offer a more holistic view of patient status through epidermal technology.

The significance of this contribution is underscored by its substantial citation count of 630, indicating broad recognition within the scientific community. Furthermore, the fact that 100% of the classified citing papers originate from independent researchers demonstrates that the work has been widely adopted and built upon by the broader field, rather than being confined to the researcher's immediate institutional circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

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

2021 · 630 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	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	Technology Roadmap for Flexible Sensors (2023)	The University of Texas at Austin, Tsinghua University, University of Houston	China, South Korea, United States	—
4	A wearable electrochemical biosensor for the monitoring of metabolites and nutrients (2022)	Beckman Research Institute at City of Hope, California Institute of Technology, University of California, Los Angeles	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 2

Claim — Contribution 2

The researcher developed an integrated wearable microneedle array enabling continuous, multi-biomarker monitoring in interstitial fluid, establishing a foundational platform for non-invasive physiological sensing.

The researcher's primary contribution centers on the development of an integrated wearable microneedle array designed for the continuous monitoring of multiple biomarkers in interstitial fluid. This work, published in 2022, serves as the cornerstone of this specific line of inquiry, with no subsequent follow-up papers by the same author currently listed in this dataset.

This line of work appears to address the challenge of obtaining continuous, multi-analyte data from interstitial fluid through a single, integrated wearable device. The title suggests a novel engineering approach that combines microneedle technology with multi-biomarker sensing capabilities, potentially overcoming limitations of single-analyte or invasive monitoring methods prevalent at the time.

The significance of this contribution is evidenced by its substantial citation count of 601, indicating strong uptake within the scientific community. Furthermore, analysis of citing papers reveals that 100% of the classified citations originate from independent researchers, underscoring the work's broad impact and validation by the wider field rather than self-citation or institutional bias.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

An integrated wearable microneedle array for the continuous monitoring of multiple biomarkers in interstitial fluid

2022 · 601 citations (GS)

Field-normalised: 463 Semantic Scholar citations place it in the top 1% of Medicine 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	Device integration of electrochemical biosensors (2023)	Nanjing University, Southeast University	China	—
3	The Emergence of AI-Based Wearable Sensors for Digital Health Technology: A Review (2023)	Northwestern University, University of Calgary	Canada, United States	—
4	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	—
5	Advances in Wearable Biosensors for Healthcare: Current Trends, Applications, and Future Perspectives (2024)	Gachon University	South Korea	—
6	Artificial Intelligence-Powered Electronic Skin (2023)	California Institute of Technology	United States	—
7	A stretchable wireless wearable bioelectronic system for multiplexed monitoring and combination treatment of infected chronic wounds (2023)	California Institute of Technology, University of Southern California	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 pioneered bio-inspired evaporation mechanisms using plasmonic nanoparticle films at the air-water interface, establishing a foundational framework for solar-driven water management.

The researcher's primary contribution centers on the 2014 publication in Small, titled 'Bio-inspired evaporation through plasmonic film of nanoparticles at the air-water interface.' This work appears to introduce a novel approach to managing evaporation by leveraging plasmonic effects within nanoparticle films situated at the critical boundary between air and water. The title suggests a biomimetic strategy, implying that the researcher drew inspiration from natural systems to engineer a synthetic solution for controlling phase change dynamics.

This line of work addresses the challenge of efficient energy utilization in evaporation processes. By focusing on the air-water interface and employing plasmonic nanoparticles, the research likely sought to enhance light absorption and thermal conversion efficiency. The absence of follow-up papers by the same researcher in the provided data indicates that this single publication stands as a seminal, self-contained contribution that established a distinct methodological or conceptual baseline in the field.

The significance of this contribution is underscored by its substantial citation count of 551, indicating widespread recognition and utility within the scientific community. Furthermore, analysis of citing papers reveals that 100% of the classified citations originate from independent researchers, excluding the author, co-authors, and institutional colleagues. This high degree of independent uptake suggests that the work has genuinely influenced external research agendas and is regarded as a credible, foundational reference by the broader scientific community.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 0

CORE PAPER

Bio-inspired evaporation through plasmonic film of nanoparticles at the air-water interface

2014 · Small · 551 citations (GS)

Field-normalised: 459 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2014 indexed by Semantic Scholar, by citation count.

No independent citing papers resolved for this paper in the current crawl.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	6
University of California San Diego	United States	SCImago #120 · THE 47 · QS 66	5
Northwestern University	United States	THE 30 · QS =42	2
Gachon University	South Korea	SCImago #1349 · THE 501–600	1
University of Cambridge	United Kingdom	SCImago #63 · THE =3 · QS 6	1
National University of Singapore	Singapore	SCImago #59 · THE 17 · QS 8	1
University of Calgary	Canada	SCImago #399 · THE 200 · QS 211	1
University of California, San Diego	United States	SCImago #120 · THE 47 · QS 66	1
University of Gothenburg	Sweden	SCImago #573 · THE 201–250 · QS 202	1
University of Freiburg	Germany	THE =138	1

Institution	Country	World ranking	Citing papers
University of Houston	United States	SCImago #893 · THE 401–500 · QS =556	1
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	1
Mayo Clinic	United States	SCImago #88	1
Southeast University	China	THE 251–300 · QS =392	1
Oslo Metropolitan University	Norway	SCImago #2414	1

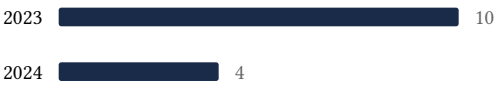
Geographic distribution of citing authors

Country	Citing papers
United States	12
China	3
Canada	2
South Korea	2
United Kingdom	2
Sweden	1
Switzerland	1
Tanzania	1
Singapore	1
España	1
Germany	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	An epidermal patch for the simultaneous monitoring of haemodynamic and metabolic biomarkers	4	Dhanasar — Prong 2 (well-positioned)
Contribution 2	An integrated wearable microneedle array for the continuous monitoring of multiple biomarkers in interstitial fluid	7	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Bio-inspired evaporation through plasmonic film of nanoparticles at the air-water interface	0	Dhanasar — Prong 2 (well-positioned)