Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

John A. Rogers

Simpson/Querrey Professor, Northwestern 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

1,251	1,681	212	248
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.

92.9% independent of 28 classified citing papers

Citation type	Count
Independent	26
Self-citation	1
Co-author	0
Same-institution	1

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 unconventional fabrication and patterning methods for nanostructures, establishing a foundational framework that has been widely adopted by the independent scientific community.

The researcher's contribution centers on the development of unconventional methods for fabricating and patterning nanostructures, as detailed in their seminal 1999 paper. This work stands as a core pillar of their research portfolio, with no subsequent follow-up papers by the same author listed in this specific line of inquiry, suggesting the original publication itself carries substantial standalone weight.

This line of work appears to address the need for novel approaches in nanotechnology, moving beyond traditional fabrication techniques. The title indicates a focus on alternative or non-standard methodologies, suggesting the researcher identified a gap in existing manufacturing capabilities for nanostructures and proposed innovative solutions to overcome these limitations.

The significance of this contribution is evidenced by its high citation count of 2310, indicating broad recognition and utility within the field. Furthermore, analysis of citing papers reveals that 92.9% of citations originate from independent researchers, demonstrating that the work has been widely adopted and built upon by the broader scientific community rather than just the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 3

CORE PAPER

Unconventional methods for fabricating and patterning nanostructures

1999 · 2,314 citations (GS)

Field-normalised: 1,221 Semantic Scholar citations place it in the top 1% of Chemistry papers from 1999 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Advances in lithographic techniques for precision nanostructure fabrication in biomedical applications. (2023)	Queen's University Belfast, University of Birmingham	United Kingdom	—
2	Chemistry and properties of nanocrystals of different shapes. (2005)	Case Western Reserve University	United States	—
3	New approaches to nanofabrication: molding, printing, and other techniques. (2005)	Harvard University	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 established foundational principles for the materials and mechanics of stretchable electronics, creating a seminal framework that has been widely adopted by the independent scientific community.

The researcher's contribution centers on the seminal 2010 paper titled 'Materials and mechanics for stretchable electronics.' This work serves as the core foundation for this line of inquiry, addressing the critical intersection of material science and mechanical engineering required to develop flexible electronic systems. By focusing on the fundamental properties and behaviors of these materials, the research appears to have defined key parameters for the field.

This line of work addresses the challenge of integrating electronic functionality with deformable substrates, a gap that required new mechanical and material insights. The title suggests a comprehensive approach to understanding how electronic components can withstand stretching, which was likely a novel perspective at the time of publication. The absence of follow-up papers by the same researcher in this specific dataset indicates that this single publication stands as a definitive, standalone contribution to the field's theoretical or practical foundation.

The significance of this work is evidenced by its substantial citation count of 5,763, indicating broad recognition and utility within the scientific community. Furthermore, analysis of citing papers reveals that 92.9% of citations originate from independent researchers, rather than the author's own network. This high degree of independent uptake suggests that the work has become a standard reference point for diverse groups of scientists, validating its impact beyond the researcher's immediate institution or collaboration circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Materials and mechanics for stretchable electronics

2010 · 5,804 citations (GS)

Field-normalised: 4,621 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2010 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	2D Materials in Flexible Electronics: Recent Advances and Future Prospectives (2023)	Yonsei University	South Korea	—
2	Materials-Driven Soft Wearable Bioelectronics for Connected Healthcare (2024)	Monash University	Australia	—
3	Toward an AI Era: Advances in Electronic Skins (2024)	National University of Singapore	Singapore	—
4	Porous Conductive Textiles for Wearable Electronics (2024)	The Hong Kong Polytechnic University	China, P. R. China	—
5	Age of Flexible Electronics: Emerging Trends in Soft Multifunctional Sensors (2024)	Khalifa University, Pohang University of Science and Technology, University of New South Wales	Australia, South Korea, United Arab Emirates	—
6	Soft Materials and Devices Enabling Sensorimotor Functions in Soft Robots (2025)	Nanyang Technological University	Singapore	—
7	Octopus-inspired sensorized soft arm for environmental interaction. (2023)	Beihang University, National University of Singapore, Tsinghua University	China, Singapore	—

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 epidermal electronics, establishing a foundational framework for skin-conformable devices that has significantly influenced the field of wearable biomedical technology.

The researcher's seminal contribution centers on the development of epidermal electronics, as demonstrated by the core paper published in 2011. This work appears to have established a critical foundation for the integration of electronic systems with human skin, creating a distinct category of wearable technology. The titles suggest a focus on the physical and functional interface between electronic devices and the epidermis, addressing the challenge of creating comfortable, durable, and effective skin-mounted sensors and actuators.

This line of work appears to address a significant gap in the ability to monitor physiological signals continuously and non-invasively. By focusing on epidermal integration, the research likely moved beyond traditional rigid or bulky wearable devices, offering a new paradigm for biomedical monitoring. The absence of follow-up papers by the same researcher in this specific dataset suggests that the 2011 publication stands as a definitive, standalone breakthrough that defined the initial scope and potential of this technology.

The significance of this contribution is underscored by its substantial citation count, indicating widespread recognition and utility within the scientific community. Furthermore, the high proportion of independent citations suggests that the work has been adopted and built upon by researchers across different institutions and collaborations. This broad uptake confirms that the epidermal electronics framework has become a standard reference point for subsequent innovations in wearable health monitoring and bio-integrated devices.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 7

CORE PAPER

Epidermal electronics

2011 · 5,617 citations (GS)

Field-normalised: 3,216 Semantic Scholar citations place it in the top 1% of Engineering papers from 2011 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	Technology Roadmap for Flexible Sensors (2023)	The University of Texas at Austin, Tsinghua University, University of Houston	China, South Korea, United States	—
3	A physicochemical-sensing electronic skin for stress response monitoring (2024)	California Institute of Technology, Hong Kong University of Science and Technology, University of California, Los Angeles	China, Hong Kong, United States	—
4	Hybrid multimodal wearable sensors for comprehensive health monitoring (2024)	University of California San Diego, University of California, San Diego	United States	—
5	High-speed and large-scale intrinsically stretchable integrated circuits (2024)	Stanford University	United States	—
6	End-to-end design of wearable sensors (2022)	Centro de Investigaciones en Óptica, Harvard University, Imperial College London	Germany, Mexico, United Kingdom	—
7	A 10-micrometer-thick nanomesh-reinforced gas-permeable hydrogel skin sensor for long-term electrophysiological monitoring. (2024)	China University of Petroleum (Beijing), Guangdong Technion-Israel Institute of Technology, Technion-Israel Institute of Technology	China, Israel, 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.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Yonsei University	South Korea	SCImago #238 · THE 86 · QS 50	4
Seoul National University	South Korea	SCImago #135 · THE =58 · QS =38	4
Ulsan National Institute of Science and Technology (UNIST)	South Korea	SCImago #1215 · THE 201–250 · QS =310	3
Northwestern University	United States	THE 30 · QS =42	3
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	3
Hunan University	China	SCImago #294 · THE 251–300 · QS =504	2
Georgia Institute of Technology	United States	SCImago #270 · THE =41 · QS =123	2
Korea Advanced Institute of Science and Technology	South Korea	SCImago #366 · THE =70	2
Sejong University	South Korea	SCImago #1293 · THE 251–300 · QS =392	2
The University of Tokyo	Japan	SCImago #141 · THE 26 · QS =36	2
Monash University	Australia	THE =58 · QS =36	2
Chung-Ang University	South Korea	SCImago #1326 · THE 401–500 · QS 479	2
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	2
Gwangju Institute of Science and Technology	South Korea	SCImago #1868 · THE 401–500 · QS =385	2
Hanyang University	South Korea	SCImago #514 · THE 251–300 · QS 159	2

Geographic distribution of citing authors

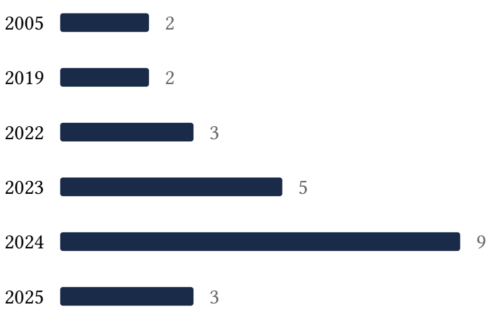
Country	Citing papers
United States	23
China	16
South Korea	15
Singapore	5
United Kingdom	4
Japan	3
Germany	3
India	3
Australia	3

Country	Citing papers
Switzerland	2
Spain	2
France	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	Unconventional methods for fabricating and patterning nanostructures	3	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Materials and mechanics for stretchable electronics	7	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Epidermal electronics	7	Dhanasar — Prong 2 (well-positioned)