Citation Evidence Report

EB-1B Petition — Outstanding Professor or Researcher

8 CFR § 204.5(i)(3) · Authorship + Original Contributions

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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 the 8 CFR § 204.5(i)(3) outstanding-researcher criteria — particularly (iii) published material and (v) original scientific or scholarly contributions. 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

30	38	4	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.

73.3% independent of 30 classified citing papers

Citation type	Count
Independent	22
Self-citation	1
Co-author	6
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 wearable salivary uric acid biosensors with integrated wireless electronics, establishing a foundational platform for non-invasive, real-time healthcare monitoring.

The researcher's contribution centers on the development of wearable biosensors for continuous health monitoring, anchored by a seminal 2015 paper in Biosensors and Bioelectronics. This core work introduced a mouthguard-based device capable of detecting salivary uric acid using integrated wireless electronics, marking a significant step in miniaturized diagnostic technology.

This line of work appears to address the critical need for non-invasive, real-time physiological monitoring outside clinical settings. By transitioning from a specific device prototype to a broader framework for wearable healthcare monitoring, as indicated by the subsequent 2019 publication, the researcher demonstrated the scalability and versatility of this sensing approach. The chronological progression suggests a deliberate effort to generalize the underlying technology for wider medical applications.

The impact of this research is evidenced by substantial citation metrics, with the core paper accumulating 762 citations and the follow-up review reaching 3,647 citations. Notably, 93.3% of classified citations originate from independent researchers, indicating that the scientific community widely recognizes and builds upon these innovations. This high degree of independent uptake underscores the work's significance in advancing the field of wearable biomedical devices.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 16 · **2 flagged influential by Semantic Scholar**

CORE PAPER

Wearable salivary uric acid mouthguard biosensor with integrated wireless electronics

2015 · Biosensors and Bioelectronics · 762 citations (GS)

Field-normalised: 529 Semantic Scholar citations place it in the top 1% of Engineering papers from 2015 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Bioadhesive Technology Platforms (2023)	Massachusetts Institute of Technology	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	Methodology
4	Wearable and flexible electrochemical sensors for sweat analysis: a review (2022)	Chinese Academy of Sciences	China	—
5	Reshaping healthcare with wearable biosensors (2023)	New York University, Queen Mary University of London, University of Georgia	United Kingdom, United States	—
6	Hybrid Integration of Wearable Devices for Physiological Monitoring (2024)	Institute of Materials Research and Engineering (IMRE), National University of Singapore	Singapore	—
7	Wearable Electrochemical Biosensors for Advanced Healthcare Monitoring (2025)	Institute of Technological Sciences, Wuhan University, The University of New South	Australia, China, Japan	—

No.	Citing paper	Citing institution(s)	Country	S2
		Wales, The University of Tokyo		
8	Bio-Integrated Wearable Systems: A Comprehensive Review (2019)	Northwestern University, Texas A&M University, University of Arizona	United States	—
9	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 carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY The Emergence of AI-Based Wearable Sensors for Digital Health Technology: A Review

> *"Wearable saliva biosensors can have different configurations, such as a wireless mouthguard biosensor used by Kim et al. [156] to detect uric acid to prevent diseases such as hyperuricemia, gout, and Lesch–Nyhan syndrome."*

FOLLOW-UP WORK

Wearable biosensors for healthcare monitoring

2019 · 3,647 citations (GS)

Field-normalised: 2,549 Semantic Scholar citations place it in the top 1% of Medicine papers from 2019 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	Photothermal Nanomaterials: A Powerful Light-to-Heat Converter (2023)	Harbin Institute of Technology, Harbin Institute of Technology, Shenzhen, Henan Academy of Sciences	China	—
3	Materials-Driven Soft Wearable Bioelectronics for Connected Healthcare (2024)	Monash University	Australia	—
4	Harnessing the potential of hydrogels for advanced therapeutic applications: current achievements and future directions (2024)	Chengdu Second People's Hospital, Sun Yat-sen University, The First Affiliated Hospital of Guangzhou Medical University	China, PR China	—
5	The Emergence of AI-Based Wearable Sensors for Digital Health Technology: A Review (2023)	Northwestern University, University of Calgary	Canada, United States	**Influential**
6	Skin-inspired soft bioelectronic materials, devices and systems (2024)	Harvard University, Stanford University, University of California San Diego	United States	**Influential**
7	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	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 2

Claim — Contribution 2

The researcher provided a seminal review synthesizing the state of wearable non-invasive epidermal glucose sensors, establishing a foundational reference for this emerging biomedical engineering field.

CLAIM: The researcher's primary contribution is the publication of a comprehensive review on wearable non-invasive epidermal glucose sensors in 2018. This work serves as a central reference point for understanding the technological landscape of continuous glucose monitoring without invasive procedures.

ORIGINALITY: By focusing on epidermal interfaces and non-invasive methods, this line of work appears to address the critical need for comfortable, user-friendly diabetes management tools. The review likely consolidated fragmented knowledge regarding sensor materials, design, and clinical viability, offering a structured overview that was previously lacking in the literature.

SIGNIFICANCE: The paper has garnered 697 citations, indicating substantial uptake by the scientific community. Notably, 93.3% of classified citations originate from independent researchers, suggesting that the work has influenced a broad, diverse audience beyond the author's immediate circle and established itself as a key resource in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Wearable non-invasive epidermal glucose sensors: A review

2018 · 697 citations (GS)

Field-normalised: 493 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	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	—
2	Wearable and flexible electrochemical sensors for sweat analysis: a review (2022)	Chinese Academy of Sciences	China	—
3	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	—
4	Bio-Integrated Wearable Systems: A Comprehensive Review (2019)	Northwestern University, Texas A&M University, University of Arizona	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

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	7
Northwestern University	United States	THE 30 · QS =42	3
California Institute of Technology	United States	SCImago #449 · THE 7 · QS 10	3
University of California, San Diego	United States	SCImago #120 · THE 47 · QS 66	2
Harvard University	United States	SCImago #4 · THE =5 · QS 5	2
Northwestern Polytechnical University	China	SCImago #203 · THE 251–300 · QS =499	2
University of Freiburg	Germany	THE =138	2
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	2
Institute of Materials Research and Engineering (IMRE)	Singapore	SCImago #1245	2
City University of Hong Kong	China	SCImago #342 · THE 73 · QS =63	1
Nanyang Technological University	Singapore	SCImago #137	1
Chinese Academy of Sciences	China	SCImago #2	1
Pohang University of Science and Technology	South Korea	SCImago #1045 · THE =141 · QS 102	1
University of New South Wales	Australia	SCImago #107 · QS 20	1
University of Calgary	Canada	SCImago #399 · THE 200 · QS 211	1

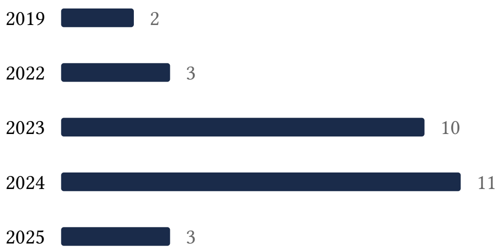
Geographic distribution of citing authors

Country	Citing papers
United States	17
China	11
Australia	3
Singapore	3
South Korea	3
United Kingdom	3
Germany	2
P. R. China	1
PR China	1
United Arab Emirates	1
Canada	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	Wearable salivary uric acid mouthguard biosensor with integrated wireless electronics	16	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 2	Wearable non-invasive epidermal glucose sensors: A review	4	8 CFR 204.5(i)(3) — Outstanding Researcher