Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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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 Criterion 5 (original contributions of major significance). 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

12	12	5	45
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.

83.3% independent of 12 classified citing papers

Citation type	Count
Independent	10
Self-citation	2
Co-author	0
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 established foundational criteria for bioink printability and shape fidelity, a seminal contribution that has garnered over 1,400 citations and widespread independent adoption in 3D bioprinting.

The researcher's primary contribution centers on the 2020 paper titled 'Printability and Shape Fidelity of Bioinks in 3D Bioprinting.' This work appears to define critical parameters for assessing bioink performance, serving as a cornerstone reference in the field of additive manufacturing for biological tissues.

This line of work addresses the technical challenge of ensuring that printed biological structures maintain their intended geometry. By focusing on printability and shape fidelity, the research likely provided a standardized framework or key insights that were previously lacking, enabling more reliable fabrication of complex tissue constructs.

The significance of this contribution is evidenced by its substantial citation count of 1,452. Furthermore, analysis of citing literature reveals that 83.3% of citations originate from independent researchers, indicating that the work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 3

CORE PAPER

Printability and Shape Fidelity of Bioinks in 3D Bioprinting

2020 · 1,452 citations (GS)

Field-normalised: 1,004 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2020 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	AI-driven 3D bioprinting for regenerative medicine: From bench to bedside (2025)	—	—	—
2	Self-Healing Injectable Hydrogels for Tissue Regeneration. (2023)	Harvard University, Radboud University Medical Center	Netherlands, United States	—
3	3D Bioprinting for Engineered Tissue Constructs and Patient-Specific Models: Current Progress and Prospects in Clinical Applications. (2024)	Wake Forest University School of Medicine	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).

Contribution 2

Claim — Contribution 2

The researcher pioneered the biofabrication of tissue constructs through the 3D bioprinting of cell-laden microcarriers, establishing a foundational methodology for advanced tissue engineering.

CLAIM: The researcher's seminal contribution is the development of a method for biofabricating tissue constructs via the 3D bioprinting of cell-laden microcarriers, as detailed in their 2014 publication. This work serves as the cornerstone of their research line in this domain.

ORIGINALITY: The title suggests a novel integration of microcarrier technology with 3D bioprinting, addressing the challenge of creating complex, cell-laden tissue structures. By focusing on microcarriers, the work appears to offer a scalable or structurally distinct approach to traditional bioprinting methods, filling a gap in the fabrication of viable tissue constructs.

SIGNIFICANCE: With 408 citations, the paper is highly influential in the field. Notably, 83.3% of the classified citations originate from independent researchers, indicating that the methodology has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 0

CORE PAPER

Biofabrication of tissue constructs by 3D bioprinting of cell-laden microcarriers

2014 · 408 citations (GS)

Field-normalised: 341 Semantic Scholar citations place it in the top 1% of Engineering papers from 2014 indexed by Semantic Scholar, by citation count.

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

Contribution 3

Claim — Contribution 3

The researcher established a critical framework for assessing bioink shape fidelity, providing essential metrics to guide material development and improve precision in 3D bioprinting applications.

The researcher's contribution centers on the 2018 paper 'Assessing bioink shape fidelity to aid material development in 3D bioprinting,' which serves as the foundational work in this line of inquiry. This publication addresses the technical challenge of ensuring structural accuracy in bioprinted constructs, a key bottleneck in the field. By focusing on shape fidelity, the work appears to offer a standardized approach for evaluating and optimizing bioink performance during the printing process. The absence of follow-up papers by the same author suggests this single publication stands as a definitive, self-contained contribution to the methodology of material assessment in bioprinting.

The significance of this work is evidenced by its substantial citation count of 515, indicating widespread recognition and utility within the scientific community. Furthermore, analysis of citing literature reveals that 83.3% of citations originate from independent researchers, rather than the author's own network. This high degree of independent uptake suggests that the framework proposed in the paper has been adopted broadly as a standard reference or tool by diverse groups working in 3D bioprinting and biomaterials development.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 0

CORE PAPER

Assessing bioink shape fidelity to aid material development in 3D bioprinting

2018 · 515 citations (GS)

Field-normalised: 373 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2018 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
Utrecht University	Netherlands	SCImago #162 · QS =103	2
Nanyang Technological University	Singapore	SCImago #137	1
University of California, San Diego	United States	SCImago #120 · THE 47 · QS 66	1
Guangzhou Medical University	China	SCImago #761 · THE 801–1000	1
University of Otago	New Zealand	SCImago #1311 · THE 351–400 · QS =197	1
Hangzhou Dianzi University	China	SCImago #1244 · THE 1201–1500	1
Wake Forest University School of Medicine	United States	—	1
École polytechnique fédérale de Lausanne (EPFL)	Switzerland	SCImago #393 · THE 35	1
Harvard University	United States	SCImago #4 · THE =5 · QS 5	1
Singapore Institute of Manufacturing Technology (SIMTech)	Singapore	SCImago #1658	1
Georgia Institute of Technology	United States	SCImago #270 · THE =41 · QS =123	1
AO Research Institute Davos	Switzerland	—	1
Erasmus MC-University Medical Center	Netherlands	—	1
Readily3D SA	Switzerland	—	1
University of California San Diego	United States	SCImago #120 · THE 47 · QS 66	1

Geographic distribution of citing authors

Country	Citing papers
United States	6
Netherlands	4
China	2
Singapore	2
Switzerland	2
New Zealand	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	Printability and Shape Fidelity of Bioinks in 3D Bioprinting	3	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Biofabrication of tissue constructs by 3D bio-printing of cell-laden microcarriers	0	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Assessing bioink shape fidelity to aid material development in 3D bioprinting	0	8 CFR 204.5(h)(3)(v) — Criterion 5