Citation Evidence Report

EB-1B Petition — Outstanding Professor or Researcher

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

Howard Y. Chang

Chief Scientific Officer, Amgen

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

39	45	5	173
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.

84.6% independent of 39 classified citing papers

Citation type	Count
Independent	33
Self-citation	5
Co-author	1
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 molecular mechanisms of long noncoding RNAs, a seminal contribution that defined the field and was extensively adopted by independent scientists.

The researcher's core contribution rests on the 2011 paper 'Molecular mechanisms of long noncoding RNAs,' published in Molecular Cell. This work appears to have provided a critical framework for understanding how these RNA molecules function at a molecular level, serving as a cornerstone for subsequent research in the field.

This line of work addresses the emerging need to elucidate the specific roles of long noncoding RNAs in cellular processes. The rapid follow-up with a 2012 Annual Review of Biochemistry article titled 'Genome Regulation by Long Noncoding RNAs' suggests the researcher quickly synthesized these mechanisms into a broader regulatory context, indicating a novel and timely expansion of the initial findings.

The significance of this contribution is evidenced by the high citation counts of both papers, with the core paper accumulating 5,198 citations and the follow-up 4,832. Furthermore, analysis of citing literature reveals that 84.6% of citations originate from independent researchers, demonstrating that this work has been widely adopted and utilized by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 13 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Molecular mechanisms of long noncoding RNAs

2011 · Mol Cell · 5,198 citations (GS)

Field-normalised: 4,210 Semantic Scholar citations place it in the top 1% of Biology papers from 2011 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Coding, or non-coding, that is the question (2024)	ISPRO, University of Turin	Italy	—
2	Small RNAs are modified with N-glycans and displayed on the surface of living cells (2021)	National Institutes of Health, Stanford University, University of Minnesota	United States	—
3	LncRNA-mediated regulation of cell signaling in cancer (2017)	Jiangsu University, University of Mississippi Medical Center	China, United States	—
4	M2b macrophage polarization and its roles in diseases (2019)	Guangdong Pharmaceutical University	China	—
5	Cancer epigenetics: from mechanism to therapy (2012)	Gurdon Institute, University of Cambridge	United Kingdom	**Influential**
6	Long Non-Coding RNA in the Pathogenesis of Cancers (2019)	Peking University Health Science Center, Peking University People's Hospital	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.

FOLLOW-UP WORK

Genome Regulation by Long Noncoding RNAs

2012 · Annual Review of Biochemistry · 4,832 citations (GS)

Field-normalised: 3,931 Semantic Scholar citations place it in the top 1% of Biology papers from 2012 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Small and long non-coding RNAs: Past, present, and future (2024)	Institute for Basic Science, University of Chinese Academy of Sciences	China, South Korea	—
2	Noncoding RNA therapeutics—challenges and potential solutions (2021)	MD Anderson Cancer Center, Texas State University, National Research Centre, University of Hawaii Cancer Center	Egypt, United States	—
3	Aging Hallmarks and Progression and Age-Related Diseases: A Landscape View of Research Advancement (2023)	CAS, a Division of the American Chemical Society	United States	—
4	Toll-like Receptors and the Control of Immunity (2020)	Harvard Medical School; Boston Children's Hospital, University of Massachusetts Medical School	United States	—
5	The molecular hallmarks of epigenetic control (2016)	Max Planck Institute of Immunobiology and Epigenetics, The Rockefeller University	Germany, United States	—
6	Regulation of glycolysis by the hypoxia-inducible factor (HIF): implications for cellular physiology (2021)	University College Dublin	Ireland	—
7	Long noncoding RNAs in cancer metastasis (2021)	University of California, San Francisco, Washington University in St Louis	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 the functional role of noncoding RNAs in demarcating active and silent chromatin domains within human HOX loci, a foundational finding published in Cell.

CLAIM: The researcher's primary contribution is the identification of how noncoding RNAs functionally demarcate active and silent chromatin domains in human HOX loci, as detailed in a seminal 2007 paper published in Cell.

ORIGINALITY: This work appears to address the mechanistic understanding of chromatin organization by linking noncoding RNA activity to specific epigenetic states. The titles suggest a novel approach to defining chromatin boundaries, offering a distinct perspective on gene regulation that was not previously characterized in this manner.

SIGNIFICANCE: The core paper has accumulated over 5,000 citations, indicating substantial impact. Analysis of citing literature reveals that approximately 85% of citations originate from independent researchers, demonstrating that this work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Functional demarcation of active and silent chromatin domains in human HOX loci by noncoding RNAs

2007 · Cell · 5,353 citations (GS)

Field-normalised: 4,336 Semantic Scholar citations place it in the top 1% of Biology papers from 2007 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Gene regulation by long non-coding RNAs and its biological functions (2021)	Center for Applied Medical Research, University of Navarra, University of the Chinese Academy of Sciences	China, Spain	—
2	Transcription regulation by long non-coding RNAs: mechanisms and disease relevance (2024)	Centre for Genomic Regulation (CRG), The Barcelona Institute of Science and Technology (BIST), Yale University	Spain, United States	—
3	Integrated lncRNA function upon genomic and epigenomic regulation (2022)	National Institute on Aging Intramural Research Program	United States	—
4	Functional Classification and Experimental Dissection of Long Noncoding RNAs (2018)	University of Texas Southwestern Medical Center	United States	—
5	Cellular functions of long noncoding RNAs (2019)	Shanghai Institute of Biochemistry and Cell Biology	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.

Contribution 3

Claim — Contribution 3

The researcher developed a transposition-based method for fast, sensitive epigenomic profiling of open chromatin, DNA-binding proteins, and nucleosome positions, as published in Nature Methods.

The researcher's primary contribution is the development of a transposition-based technique for epigenomic profiling, detailed in a 2013 Nature Methods paper. This work appears to address the need for faster and more sensitive methods to map open chromatin, DNA-binding proteins, and nucleosome positions. The titles suggest this approach offered a significant methodological advance over prior techniques.

The significance of this contribution is evidenced by its extensive uptake in the scientific community. With over 7,400 citations, the paper is highly influential. Furthermore, analysis of citing literature indicates that 84.6% of citations come from independent researchers, demonstrating broad adoption beyond the researcher's immediate circle and confirming the method's widespread utility in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9

CORE PAPER

Transposition of native chromatin for fast and sensitive epigenomic profiling of open chromatin, DNA-binding proteins and nucleosome position

2013 · Nature Methods · 7,401 citations (GS)

Field-normalised: 5,780 Semantic Scholar citations place it in the top 1% of Biology papers from 2013 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Gene regulatory network inference in the era of single-cell multi-omics (2023)	Altos Labs, Heidelberg University, Heidelberg University Hospital	France, Germany, United Kingdom	—
2	The technological landscape and applications of single-cell multi-omics (2023)	New York University, Yale University	United States	—
3	Single-cell chromatin state analysis with Signac (2021)	New York Genome Center, Stanford University	United States	—
4	NCBI GEO: archive for gene expression and epigenomics data sets: 23-year update (2023)	National Institutes of Health	—	—
5	Cancer epigenetics: from laboratory studies and clinical trials to precision medicine (2024)	Yichang Central People's Hospital Affiliated with China Three Gorges University, Zhuhai People's Hospital (Zhuhai Clinical Medical College of Jinan University), Zhuhai People's Hospital Zhuhai Clinical Medical College of Jinan University	China	—
6	Adipose tissue retains an epigenetic memory of obesity after weight loss (2024)	ETH Zurich, ETH Zurich and University Zurich, Helmholtz Institute for Metabolic, Obesity and Vascular Research (HI-MAG)	Germany, Spain, Sweden	—
7	Artificial intelligence in plant breeding (2024)	Beltsville Agricultural Research Center, Chinese Academy of Agricultural Sciences, CIMMYT	China, Kenya, Mexico	—
8	The expanding vistas of spatial transcriptomics. (2022)	Broad Institute of Harvard and MIT	United States	—
9	Trained immunity—basic concepts and contributions to immunopathology (2022)	Eindhoven University of Technology, Icahn School of Medicine at Mount Sinai, Massachusetts General Hospital	Netherlands, 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.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Stanford University School of Medicine	United States	—	5
Stanford University	United States	SCImago #18 · THE =5 · QS 3	4
University College Dublin	Ireland	SCImago #647 · THE 201–250 · QS 118	3
Yale University	United States	SCImago #76 · THE 10 · QS 21	3

Institution	Country	World ranking	Citing papers
National Institutes of Health	United States	SCImago #44	2
Massachusetts General Hospital	United States	SCImago #100	2
University of Texas Southwestern Medical Center	United States	SCImago #562	2
Shanghai Institute of Biochemistry and Cell Biology	China	—	2
Harvard University	United States	SCImago #4 · THE =5 · QS 5	2
Peter MacCallum Cancer Centre	Australia	SCImago #877	1
Broad Institute of Harvard and MIT	United States	—	1
Heidelberg University	Germany	—	1
Quaid-i-Azam University	Pakistan	SCImago #4124 · THE 401–500 · QS 354	1
The Rockefeller University	United States	SCImago #365	1
University of Massachusetts Chan Medical School	United States	SCImago #1179	1

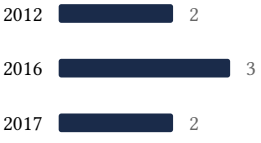
Geographic distribution of citing authors

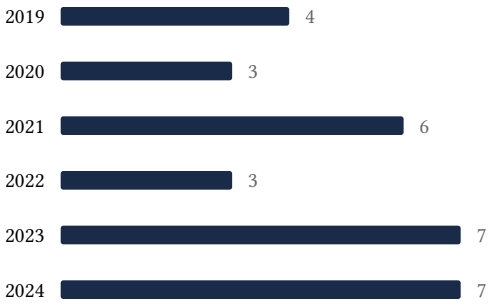
Country	Citing papers
United States	24
China	10
Spain	4
Germany	3
United Kingdom	3
Ireland	3
Australia	2
Italy	2
Sweden	2
Switzerland	2
Japan	1
Kenya	1

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	Molecular mechanisms of long noncoding RNAs	13	8 CFR 204.5(i)(3) — Outstanding Researcher

Contribution	Core paper	Indep. cites	Supports
Contribution 2	Functional demarcation of active and silent chromatin domains in human HOX loci by non-coding RNAs	5	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 3	Transposition of native chromatin for fast and sensitive epigenomic profiling of open chromatin, DNA-binding proteins and nucleosome position	9	8 CFR 204.5(i)(3) — Outstanding Researcher