

Petition Cover Letter

EB-2 National Interest Waiver · I-140 Immigrant Petition for Alien Workers · Petitioner: Dr. Sarah Chen

I. Introduction

Dr. Sarah Chen is a biomedical engineer whose work on closed-loop neural stimulation systems has materially advanced the treatment of drug-resistant epilepsy, a condition affecting more than 3.4 million Americans **[TO CONFIRM: CDC Epilepsy Data and Statistics — verify figure and year]**. Roughly one third of those patients do not respond to available medication, and for them the remaining options are resective surgery or continued seizures. Dr. Chen's research addresses that gap directly.

She petitions for a national interest waiver of the job offer and labor certification requirements under *Matter of Dhanasar*, 26 I&N Dec. 884 (AAO 2016). As set out below, her proposed endeavor has substantial merit and national importance, she is well positioned to advance it, and on balance it would benefit the United States to waive those requirements.

II. The Applicant's Qualifications

Dr. Chen holds a Ph.D. in Biomedical Engineering from Johns Hopkins University (2015) and an M.S. in Electrical Engineering from the University of California, Berkeley (2011) **[TO CONFIRM: Exhibit 2 — certified copies of both diplomas]**. She currently serves as Assistant Professor of Biomedical Engineering and Director of the Neural Interface Laboratory at Johns Hopkins University, where she leads a group of nine researchers.

She has published 38 peer-reviewed articles, which have been cited 1,240 times, with an h-index of 19 and an i10-index of 24 **[TO CONFIRM: Exhibit 4 — citation report captured within 30 days of filing]**. Her 2022 paper in *Nature Neuroscience* on closed-loop stimulation for drug-resistant epilepsy has been cited 187 times, and her 2021 paper in *IEEE Transactions on Neural Systems and Rehabilitation Engineering* on adaptive filtering for implantable devices has been cited 143 times.

Dr. Chen is Principal Investigator on an NIH R01 award of \$1,600,000 for "Closed-Loop Neuromodulation for Drug-Resistant Epilepsy" **[TO CONFIRM: Exhibit 5 — official Notice of Award]**. She has completed 63 peer review assignments between 2018 and 2024 for journals including *Nature Neuroscience*, *IEEE TNSRE* and the *Journal of Neural Engineering*.

III. The Proposed Endeavor

Dr. Chen proposes to continue developing and clinically validating adaptive closed-loop neural interfaces that detect seizure onset from intracranial signals and deliver responsive stimulation before a seizure propagates. Unlike open-loop devices, which stimulate on a fixed schedule regardless of brain state, her approach adjusts to the patient's own signal in real time.

Over the next five years the endeavor has three components: extending the detection algorithm to patients whose seizure onset is multifocal; running a multi-site clinical study with collaborating hospitals **[TO CONFIRM: named sites and study protocol number]**; and publishing the detection models openly so other laboratories and device manufacturers can build on them.

IV. Prong One: Substantial Merit and National Importance

The first prong asks whether the proposed endeavor has substantial merit and is national in importance. Merit may be shown in science, technology or health, and national importance turns on the prospective impact of the endeavor rather than on the applicant's employer or job title.

The merit of this endeavor lies in the clinical problem it addresses. Drug-resistant epilepsy carries elevated mortality, restricts employment and driving, and drives repeated emergency admissions. Reducing seizure frequency in this population changes what patients can do with their lives, and it reduces costs borne largely by public payers **[TO CONFIRM: cost estimate and source — CDC or a peer-reviewed economic analysis]**.

The endeavor is national in importance because its results are not confined to one hospital or one region. Dr. Chen's work aligns with the National Institute of Neurological Disorders and Stroke's stated priority of developing therapies for treatment-resistant neurological disease **[TO CONFIRM: NINDS strategic plan — verify title and year before filing]**, and open publication of the detection models is what allows other groups and manufacturers to adopt them.

V. Prong Two: Well Positioned to Advance the Endeavor

Record of Success in Related Efforts

Dr. Chen's record is one of completed work rather than proposals. She has taken the closed-loop approach from simulation to bench validation to an implantable prototype, secured \$1,600,000 in federal funding as Principal Investigator, and published the results in the leading journals of her field. Funding of that kind is awarded on the strength of preliminary data and the investigator's ability to deliver.

Recognition by the Academic Community

The uptake of her work is measurable outside her own institution: 1,240 citations across 38 publications, with the two papers above accounting for 330 of them. Her Google Scholar profile records an h-index of 19 and an i10-index of 24 as of **[TO CONFIRM: date captured]**. Invitations to review for *Nature Neuroscience* and

IEEE TNSRE indicate that editors in the field treat her as a qualified assessor of others' work.

[LETTER QUOTE — Prong 2: insert a direct quotation from an independent recommender establishing that the detection method was adopted outside the applicant's own laboratory. Format: "{quote}" (Letter 1, Prof. James Wilson, Stanford University).]

VI. Prong Three: Balance of Factors Favors a Waiver

The third prong asks whether, on balance, it would benefit the United States to waive the job offer and labor certification requirements. It is impractical for Dr. Chen to secure a labor certification for this endeavor: the work is defined by her own research program and her NIH award, not by a vacancy an employer could advertise and test the market for.

The benefit is also urgent in a way the certification process does not accommodate. Her R01 is already funding the work; tying its continuation to a specific employer would put a federally-funded study at risk of interruption. Even assuming qualified US workers are available, the United States benefits from this particular investigator continuing this particular line of work.

VII. Conclusion

Dr. Chen's endeavor has substantial merit and national importance, her record establishes that she is well positioned to advance it, and the balance of factors favors a waiver. The petitioner respectfully requests that the petition be approved.

Dr. Sarah Chen is an invented applicant and every figure above is illustrative. Your own package is drafted from the record you provide, with each unsupported point marked for your attention before filing.