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U.S. Department of Homeland Security
U.S. Citizenship and Immigration Services
Office of Administrative Appeals MS 2090
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U.S. Citizenship and Immigration Services

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[redacted]

FILE: [redacted] Office: TEXAS SERVICE CENTER Date: JAN 14 2010

SRC 07 800 05067

IN RE: Petitioner:
Beneficiary: [redacted]

PETITION: Immigrant Petition for Alien Worker as an Alien of Extraordinary Ability Pursuant to Section 203(b)(1)(A) of the Immigration and Nationality Act, 8 U.S.C. § 1153(b)(1)(A)

ON BEHALF OF PETITIONER:

[redacted]

INSTRUCTIONS:

This is the decision of the Administrative Appeals Office in your case. All documents have been returned to the office that originally decided your case. Any further inquiry must be made to that office.

Perry Rhew
Chief, Administrative Appeals Office

DISCUSSION: The employment-based immigrant visa petition was denied by the Director, Texas Service Center, and is now before the Administrative Appeals Office (AAO) on appeal. The appeal will be sustained and the petition will be approved.

The petitioner seeks classification as an employment-based immigrant pursuant to section 203(b)(1)(A) of the Immigration and Nationality Act (the Act), 8 U.S.C. § 1153(b)(1)(A), as an alien of extraordinary ability in the sciences. The director determined that the petitioner had not established the sustained national or international acclaim necessary to qualify for classification as an alien of extraordinary ability.

On appeal, counsel argues that the petitioner meets at least three of the regulatory criteria at 8 C.F.R. § 204.5(h)(3).

Section 203(b) of the Act states, in pertinent part, that:

> (1) Priority workers. -- Visas shall first be made available . . . to qualified immigrants who are aliens described in any of the following subparagraphs (A) through (C):
>
> > (A) Aliens with extraordinary ability. -- An alien is described in this subparagraph if --
> >
> > > (i) the alien has extraordinary ability in the sciences, arts, education, business, or athletics which has been demonstrated by sustained national or international acclaim and whose achievements have been recognized in the field through extensive documentation,
> > >
> > > (ii) the alien seeks to enter the United States to continue work in the area of extraordinary ability, and
> > >
> > > (iii) the alien's entry into the United States will substantially benefit prospectively the United States.

U.S. Citizenship and Immigration Services (USCIS) and legacy Immigration and Naturalization Service (INS) have consistently recognized that Congress intended to set a very high standard for individuals seeking immigrant visas as aliens of extraordinary ability. *See* 56 Fed. Reg. 60897, 60898-99 (Nov. 29, 1991). As used in this section, the term "extraordinary ability" means a level of expertise indicating that the individual is one of that small percentage who have risen to the very top of the field of endeavor. 8 C.F.R. § 204.5(h)(2). The specific requirements for supporting documents to establish that an alien has sustained national or international acclaim and recognition in his or her field of expertise are set forth in the regulation at 8 C.F.R. § 204.5(h)(3). The relevant criteria will be addressed below. It should be reiterated, however, that the petitioner must show that she has sustained national or international acclaim at the very top level.

This petition, filed on January 19, 2007, seeks to classify the petitioner as an alien with extraordinary ability as a biochemical engineering researcher. At the time of filing, the petitioner was working at

the Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School. The regulation at 8 C.F.R. § 204.5(h)(3) indicates that an alien can establish sustained national or international acclaim through evidence of a one-time achievement (that is, a major, internationally recognized award). Barring the alien's receipt of a major internationally recognized award, the regulation at 8 C.F.R. § 204.5(h)(3) outlines ten criteria, at least three of which must be satisfied for an alien to establish the sustained acclaim necessary to qualify as an alien of extraordinary ability. We find that the petitioner's evidence meets at least three of the regulatory criteria.

> *Evidence of the alien's participation, either individually or on a panel, as a judge of the work of others in the same or an allied field of specification for which classification is sought.*

The petitioner submitted evidence showing that she was appointed to the Editorial Board of the *Journal of Industrial Microbiology and Biotechnology*. The petitioner also submitted documentation indicating that that she reviewed a large number of manuscripts for multiple journals including *Biotechnology Progress*, *World Journal of Microbiology and Biotechnology*, *Applied Microbiology and Biotechnology*, *Journal of Applied Microbiology*, and *Biofouling*. Accordingly, we concur with the director's finding that the petitioner meets this criterion.

> *Evidence of the alien's original scientific, scholarly, artistic, athletic, or business-related contributions of major significance in the field.*

The petitioner submitted several letters of support discussing her original research contributions. We cite representative examples here.

[redacted], Member of the U.S. National Academy of Sciences and Research Fellow in Microbial Biochemistry at the Charles A. Dana Research Institute for Scientists Emeriti at Drew University, New Jersey, states:

> Since I have never collaborated with [the petitioner] nor have I supervised her, I can provide an independent evaluation of her research.
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> * * *
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> Biofilms form when bacteria come in contact with a wet surface where they form a film or "slime" on that surface. Biofilms are involved in 80% of all human infections and are resistant to traditional antibiotic treatments because they present an entry barrier for antibiotics . . . . [The petitioner's] extraordinary work . . . greatly advances our understanding of the mechanism of biofilm formation, and allows us to develop novel strategies for control of antibiotic-resistant disease-causing biofilms to prevent high recurrence of infections.
>
> [The petitioner's] innovative approach to biofilm inhibition was to screen a library of extracts to find a natural plant-based biofilm inhibitor that could circumvent the problem caused by biofilms. She found a novel inhibitor, ursolic acid, which both inhibits new biofilm formation

and removes mature biofilms in a way that is different from traditional antibiotic action. Ursolic acid promotes cell motility, or the spontaneous movement of cells, so that biofilm cells become so motile that they no longer can stay on the substrate. She also made the original discovery that biofilm formation is affected by sulfur metabolism through the gene *cysB,* thus opening the door to further therapeutic targets to eliminate antibiotic resistance caused by biofilms. [The petitioner] also made the discoveries that the quorum-sensing signal autoinducer 2 (AI-2) directly stimulates biofilm formation in many bacteria, including *E. coli*, and that a new regulator protein, MqsR, affects cell motility and biofilm production. No scientist had previously characterized AI-2's direct role in biofilm formation nor identified the novel MqsR protein before [the petitioner]. Her work (1) resulted in the description of the pathway for AI-2 control of biofilm formation; (2) opened up new research into biofilm inhibition and control; and (3) revealed MqsR's role in regulating up to 108 other proteins.

* * *

The other area of [the petitioner's] . . . research, investigating the control of biocorrosion caused by deleterious biofilms in industrial settings, resulted in another series of remarkable discoveries. [The petitioner] took the highly innovative route of fighting deleterious and corrosive biofilms using beneficial biofilms that produce antimicrobials. . . . Using antimicrobial biofilms to reduce biocorrosion is a truly inspired approach because it overcomes the transportation obstacle, as well as the problem of antimicrobial dilution. [The petitioner's] highly original research overcomes a number of longstanding barriers in this area. She was the first scientist to publish a paper in which real world industrial service water is used for studying the effect of antimicrobial-producing biofilms. She was also the first to achieve inhibition of *Desulfosporosinus orientis,* an especially damaging sulfur-reducing bacterium, and she is the first scientist to report on the simultaneous inhibition of two corrosive bacteria as a result of the applications of beneficial biofilms.

[redacted] Professor of Microbiology and Director of the Institute for Microbiology, Westfalische Wilhelms-Universitat Munster, Germany, states:

I am not personally acquainted with [the petitioner] but am well aware of her work through her publications and through my position as the Editor in Chief of the journal *Applied Microbiology and Biotechnology.*

* * *

[The petitioner] has demonstrated an excellent capacity to make new discoveries, as evidenced by the groundbreaking papers that she has published. She made the pioneering discovery of a plant-derived biofilm inhibitor, ursolic acid. While investigating how ursolic acid inhibits biofilm formation she discovered that it promotes cell motility. She was the first person to discover that sulfur metabolism affects biofilm formation in this research. Additionally, she is the first scientist to establish that the quorum-sensing signal autoinducer 2 has a direct role in biofilm formation. She made the original identification of a new global

regulator protein, MqsR, which controls 108 proteins and induces the expression of quorum-sensing regulon QseBC to promote cell motility, thus leading to biofilm formation.

[The petitioner] also made original contributions to our understanding of biocorrosion in her study of biocorrosion inhibition through the use of beneficial antimicrobial biofilms. [The petitioner] used process water from the Three Mile Island nuclear power plant in this research. She is the first scientist to publish a successful report of the inhibition of biocorrosion caused by sulfate-reducing bacteria biofilms using real world process water, suggesting potential application of this novel strategy in industry. In another paper [the petitioner] made the first ever report of the successful simultaneous inhibition of two deleterious bacteria.

* * *

Not only has [the petitioner] consistently made new and important discoveries, but her work also has broad practical applications, benefiting biomedical and industrial research and opening up new fields of inquiry for other researchers. [The petitioner's] study of ursolic acid and the mechanisms of biofilm formation and inhibition raises the potential of developing a new and highly effective treatment for biofilm infections. As a result of her work with biocorrosion, [the petitioner] has collaborated with AmerGen Energy and received a request for collaboration from Henkel Co. The Electric Power Research Institute has conducted experiments based on [the petitioner's] study successfully proving corrosion reduction at field test sites at Three Mile Island. This industrial interest and collaboration indicates the wide importance and applicability of [the petitioner's] work.

[redacted]r of Research and Director of the Center for Biofilms, School of Dentistry, University of Southern California, states:

I have not previously supervised [the petitioner's] work or collaborated with her.

* * *

First, [the petitioner] discovered a biofilm inhibitor that effectively inhibits and reduces biofilm formation for many different bacteria, including deadly *E. coli,* without triggering antibiotic resistance. . . . For this research [the petitioner] used the sophisticated and sensitive biotechnology technique of DNA microarray technology to investigate the mechanism of biofilm inhibition by ursolic acid. She found that, ursolic acid encourages cell motility; once biofilm cells become too motile they become unstable and can no longer stay on the substrate. Additionally, [the petitioner] was the first person to discover that sulfur metabolism, through the expression of the cysB gene, influences biofilm formation. . . . She has gone on to make even more groundbreaking discoveries in the mechanism of biofilm formation.

[The petitioner's] further discoveries resulted in her being the first person to describe and characterize the direct link between the quorum-sensing signal AI-2 and biofilm formation, and to discover a novel global regulator protein, MqsR, which enables cell motility, a necessary condition of biofilm formation. Although previous research had suggested a connection between AI-2 and biofilm formation, [the petitioner] made the bold and innovative discovery of AI-2's role in directly stimulating biofilm formation in many bacteria, including *E. coli.* [The petitioner's] discoveries formed the basis for the description of the pathway of AI-2 control of biofilm formation, which was later proven by the deletion mutant assay technique.

* * *

[The petitioner's] second major contribution to the biofilm field is her work in the control of biocorrosion using beneficial antimicrobial-producing biofilms. . . . Biocides and other traditional methods are insufficient at killing deleterious biofilms, especially sulfate-reducing bacteria biofilms. However, [the petitioner's] highly original strategy of fighting deleterious biofilms with beneficial biofilms has proved highly effective, with up to a 20-fold decrease in corrosion rate from sulfate-reducing bacteria. [The petitioner] used real world industrial service water from Three Mile Island in her study, an innovative strategy that has distinguished this work. The beneficial bacteria that [the petitioner] used produce antimicrobials inside the biofilm layer, thus brilliantly circumventing the challenges posed by the biofilm matrix transportation barrier. [The petitioner's] research is highly significant because it is the very first report of the use of antimicrobial-producing biofilms against sulfur-reducing bacteria using real world industrial process water. Additionally, [the petitioner] is the first scientist to report the successful simultaneous inhibition of two corrosion-causing bacteria. This work has resulted in two papers describing [the petitioner's] pioneering findings . . . .

[redacted], Department of Microbiology, National Polytechnic Institute, National School of Biological Sciences, Mexico, states:

I am . . . familiar with [the petitioner's] research through her highly regarded publications in international scientific journals, one of which was cited in my own paper.

* * *

[The petitioner's] pioneer work involves a lot of "the first" in terms of scientific findings. [The petitioner's] contributions to biofilm field can be concisely summarized as follows: 1) the discovery of a novel natural biofilm inhibitor ursolic acid and the underlying mechanisms which includes the role of sulfur metabolism in biofilm formation, 2) the clarification of the direct role of quorum sensing signal AI-2 in biofilm formation, 3) the discovery of a global motility quorum-sensing regulator MqsR, 4) the development of a novel biocorrosion control methods using regenerative antimicrobial-producing biofilms, through this method, a dramatic biocorrosion reduction in real-world process water and inhibition of corrosion

> caused by multiple corrosive biofilms were achieved for the first time. Among these achievements, the discovery of ursolic acid as an effective biofilm inhibitor is revolutionary .... [The petitioner] found for the first time in literature that quorum-sensing molecule AI-2 DIRECTLY stimulates biofilm formation, and for the first time an unknown protein MqsR was found to regulate this procedure through a series of motility regulon genes. The significance of these findings can not be underestimated since AI-2 is a non-species specific quorum-sensing signal, the regulation of AI-2 mediation of biofilm formation by MqsR thus provides a target for broad-spectrum drugs against numerous recurring biofilm infections; moreover, since MqsR regulates 108 unknown genes, it provides numerous opportunities for scientists to identify many new proteins involved in the pathways of biofilm formation, thus helping to develop novel strategies of biofilm control.

[redacted] Department of Biotechnology and Food Engineering, Technion - Israel Institute of Technology, states:

> I have never met [the petitioner], nor have I ever collaborated with her, but I am very familiar with her work through my search of the scientific literature. [The petitioner] is an excellent researcher who has gained international recognition in the field of biochemical engineering as an expert in the area of biofilm research. . . . [The petitioner's] work has proved to be extremely original and important to the field and offers numerous unique and significant discoveries that have expanded our understanding of the biochemical and microbiological mechanisms of biofilms.
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> * * *
>
> [The petitioner's] research opened up new areas of research into other plant-based biofilm inhibitors, the role of the newly discovered MqsR protein, and the clinical applications of ursolic acid. This research has implications for combating infections and for food safety.

In support of the preceding experts' statements, the petitioner submitted documentation showing dozens of cites to her published findings. These citations are solid evidence that other researchers have been influenced by the petitioner's work and are familiar with it. This evidence corroborates the independent experts' statements that the petitioner has made original contributions of major significance in her field. The record reflects that the petitioner's contributions are important not only to the institutions where she has worked, but throughout the greater field as well. Leading scientists from around the world have acknowledged the value of the petitioner's work and its major significance in her field. Accordingly, the petitioner has established that she meets this criterion.

> *Evidence of the alien's authorship of scholarly articles in the field, in professional or major trade publications or other major media.*

The petitioner submitted evidence of her authorship of several articles in publications such as *Applied Microbiology and Biotechnology*, *Corrosion Science*, *Biotechnology and Bioengineering*, *Journal of Bacteriology*, and *Applied and Environmental Microbiology*. As discussed, the petitioner

also submitted evidence of a significant amount of articles that cite to her work. Accordingly, we concur with the director's finding that the petitioner meets this criterion.

In this case, the petitioner has satisfied three of the regulatory criteria required for classification as an alien of extraordinary ability. 8 C.F.R. § 204.5(h)(3). Pursuant to the statute and regulations, the petitioner qualifies for the classification sought.

In review, while not all of the petitioner's evidence carries the weight imputed to it by counsel, the totality of the evidence establishes an overall pattern of sustained national acclaim and extraordinary ability. The petitioner has also established that she seeks to continue working in the same field in the United States and that her entry into the United States will substantially benefit prospectively the United States. Therefore, the petitioner has overcome the stated grounds for denial and thereby established eligibility for immigrant classification under section 203(b)(1)(A) of the Act.

The burden of proof in visa petition proceedings remains entirely with the petitioner. Section 291 of the Act, 8 U.S.C. § 1361. The petitioner has sustained that burden. Accordingly, the decision of the director denying the petition will be withdrawn and the petition will be approved.

ORDER: The appeal is sustained and the petition is approved.