APPLICATION FOR STUDY, RESEARCH OR ENGLISH TEACHING ASSISTANT 2017-18

Fulbright and related grants administered by the Institute of International Education

1. NAME: Mr. (*Title*) Michael (*First*) David (*Middle*) Blazanin (*Last*) (*Suffix*) (*Former Last Name*)

2. COUNTRY: Spain/SP/WE

3A. AWARD NAME: Open Study-Research

3B. UK AWARD:

3. GENERAL CATEGORY: Academic

FIELD OF STUDY: Biology|2490

5. INSTITUTION APPLYING THROUGH (OR AT-LARGE): University of Minnesota, Twin Cities, MN

6. SCREENING DEGREE LEVEL: ☒ Bachelor's ☐ Master's: ☐ Doctorate

GENERAL INFORMATION

[redacted]

GRANT PURPOSE INFORMATION

14A. PROJECT TITLE: Evolution of RNA Viruses in Response to Variable Host Susceptibility

14B. ABSTRACT/SUMMARY OF PROPOSAL:

RNA viruses are among the most dangerous human pathogens today. In order to reduce the risks they pose, we must understand how they evolve. I am proposing a research project in Valencia, Spain, which will use plant RNA viruses as a model to investigate how variation in a host population affects the evolution of RNA virus fitness. Spain is a global scientific leader, and my experience there would spur professional collaborations and lifelong personal growth.

14C. HOST COUNTRY ENGAGEMENT: Describe briefly how you will engage with the host community. Give specific ideas for community engagement.

First and foremost, I will engage the community through my interactions with members of the laboratory and the broader academic community. I am also interested in participating in, or developing, outreach activities to provide exposure to science for students. Finally, my greatest hobby is playing and designing board and card games. I will participate in community gaming events at board game stores in addition to more informal social gatherings.

15. PROPOSED HOST COUNTRY AFFILIATION (Study/research applicants only)

1) La Universidad Politécnica de Valencia, Dr. Santiago Elena
2)
3)
4) Host City and/or Region for Proposed Project: Valencia, Valencia, Spain

16. PLANS UPON RETURN TO U.S.

I will return to the United States to pursue a PhD in evolutionary biology, studying experimental viral evolution for my thesis, and using the lessons we learn from model systems to inform global responses to human pathogens. I hope to eventually become a professor, directing my own laboratory on experimental pathogen evolution, while continuing to form international collaborations, especially with colleagues from the Spanish-speaking world.

17. CRITICAL LANGUAGE ENHANCEMENT AWARD ☐ Yes ☒ No *Language to be studied:*

18. LANGUAGES AND LEVEL OF PROFICIENCY

	Language	**Level**
a)	Spanish	Advanced
b)		
c)		
d)		

APPLICANT NAME: Blazanin, Michael
COUNTRY: Spain/SP/WE

FIELD OF STUDY: Biology|2490

HOST COUNTRY EXPERIENCE

19. (1) List all travel, residence, and/or study in the country(ies) to which you are applying.

(a)

(b)

(c)

(d)

(2) Are you currently living or staying in OR prior to your grant start, do you plan an extended visit (4 or more weeks) to the country(s) to which you are applying? ☐ Yes ☒ No

(3) Comments: Use this space to discuss frequent trips to the host country and/or if you responded yes in (2), indicate the purpose and dates you are or will be in the country(ies) to which you are applying.

OTHER FOREIGN EXPERIENCE

20. FOREIGN EXPERIENCE (*List country, dates, purpose, including all travel/living.)*

	Primary Purpose	Country(s)		
1)	Vacation	India		
	Dates (Year) 08/2016-08/2016		**Duration**	3 weeks
2)	Vacation	Costa Rica		
	Dates (Year) 04/2016-04/2016		**Duration**	3 weeks
3)	Study	Venezuela		
	Dates (Year) 01/2015-05/2015		**Duration**	4 months
4)				
	Dates (Year)		**Duration**	
5)				
	Dates (Year)		**Duration**	

21. EXPERIENCE ABROAD COMMENTS:

While studying abroad in Venezuela, I took three Spanish-immersion courses: Tropical Ecology, Field Botany and Spanish Conversation and Composition, as well as an English-language course in Sustainable Tropical Agriculture. As part of my Field Botany and Tropical Ecology courses, we carried out a research project on the plant biodiversity of different ecosystems. We also took numerous field trips, both as class activities and informally, to explore other regions of Venezuela.

EDUCATION

22. EDUCATION

	Institutions attended /Country	Dates attended: From/To	Degree received/Expected	Date (mm/yyyy)	Fields of Study/Major
1)	University of Minnesota - Twin Cities United States	08/2013 to 05/2017	B.S.	05/2017	Ecology, Evolution & Behavior Math; Statistics; Microbiology
2)		/ to /		/	
3)		/ to /		/	
4)		/ to /		/	
5)		/ to /		/	

23. GRADE POINT AVERAGE: Undergraduate: 3.98 1st Master's: 2nd Master's: Doctorate:

APPLICANT NAME: Blazanin, Michael
COUNTRY: Spain/SP/WE

FIELD OF STUDY: Biology|2490

EXPERIENCE

24. OCCUPATIONAL EXPERIENCE

Name and Address of Employer	Type of Work	Dates	Full-time/Part-time
1) Kaplan, Inc. Minneapolis MN United States	ACT, SAT, GRE Instructor	06/2015 to 08/2017	☐ FT ☒ PT
2) KSU REU/Thomas Platt Lab Manhattan KS United States	Undergrad Research Experience	05/2016 to 08/2016	☒ FT ☐ PT
3) U MN UROP/Mike Travisano Lab Minneapolis MN United States	Undergraduate Research Grant	01/2016 to 05/2016	☐ FT ☒ PT
4) MnDRIVE/Satoshi Ishii Lab Minneapolis MN United States	Undergrad Research Fellowship	08/2015 to 05/2016	☐ FT ☒ PT
5) UMN Orientation & 1st Yr Prog Minneapolis MN United States	Event Staff Captain	08/2015 to 09/2015	☒ FT ☐ PT
6) Deborah Ferrington Lab Minneapolis MN United States	Laboratory Technician	06/2015 to 08/2015	☒ FT ☐ PT
7) U MN College Biol Sciences Minneapolis MN United States	Undergrad Teaching Assistant	08/2014 to 01/2015	☐ FT ☒ PT
8) Policy Innovators in Education Minneapolis MN United States	Intern	06/2014 to 10/2014	☐ FT ☒ PT

EXTRA CURRICULAR ACTIVITIES AND ACHIEVEMENTS

List your collegiate and/or recent activities/achievements, the year(s), leadership positions held, and a brief explanation, if necessary.

25. ACADEMIC HONORS, FELLOWSHIPS, SCHOLARSHIPS, AWARDS

(1) Churchill Scholarship University of Minnesota Nominee, 2016

(2) Astronaut Scholar, Astronaut Scholarship Foundation, 2016

(3) Monica Tsang and James Weatherbee College of Biological Sciences Merit Scholar, 2016

(4) College of Biological Sciences Study Abroad Scholarship, 2015

(5) Bentson Family Scholar, University of Minnesota, 2013

(6) National Merit Scholar, National Merit Scholarship Corporation, 2013

26. EXTRACURRICULAR ACTIVITIES

(1) Directed Research: Evolution of Motility & Resistance, Travisano Lab, Fall 2016

(2) Event Staff Volunteer, Orientation & First Year Programs, Fall 2014 & 2016

(3) Directed Research: Evolution of Motility & Resistance, Traviano Lab, Fall 2015

(4) Tropical Ecology & Field Botany Undergrad Research Project, VENUSA, Spring 2015

(5) Directed Research: Evolution of Bacterial Chemotaxis, Travisano Lab, Fall 2014

(6) Organizer & Moderator, Minneapolis At-Large School Board Forum, Fall 2014

(7) Students for Education Reform Organizing Fellow & U MN Chapter President, 2014

(8) Eagle Scout, Boy Scouts of America Troop 3446, Fall 2012

27. PUBLICATIONS, EXHIBITIONS, PERFORMANCES, PRESENTATIONS

(1) Publication on KSU REU research on Cooperation in Agrobacterium, Expected Spring 2017

(2) Publication on UMN research on experimental evolution of chemotaxis, Expected Spring 2017

(3) "Host Cues Select for Evol. of Avirulent Cheaters", KSU Presentation, Aug 2016

(4) "Experimental Evolution of Bacterial Motility", Winchell Symposium Honorable Mention, 2016

(5) "Measuring and Modeling Real-Time Denitrification", UMN Presentation, 2016

(6) "Evolution: Motility and Resistance", Presentation to Microbial Pop. Research Group, 2015

APPLICANT NAME: Blazanin, Michael
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FIELD OF STUDY: Biology|2490

PERSONAL INFORMATION

28. INFORMATION DOCUMENTING U.S. CITIZENSHIP:

[redacted]

29. IF A NATURALIZED U.S. CITIZEN, ENTER: Naturalization number:

Date of Naturalization: / / Place of Naturalization:

30. LIST OTHER GRANTS, SCHOLARSHIPS, OR AWARDS FOR WHICH YOU ARE APPLYING

(1) Churchill Scholarship (3)

(2) NSF Graduate Research Fellowship (4)

31. FUNDS FROM OTHER SOURCES AVAILABLE DURING THE GRANT PERIOD TO SUPPORT GRANTEE AND/OR DEPENDENTS.

Any additional expenses incurred will be covered by personal funds.

32. LIST STUDY ABROAD SCHOLARSHIPS/GRANTS AWARDED

(1) Grant Name: Country: Year:

(2) Grant Name: Country: Year:

(3) Grant Name: Country: Year:

33. EMERGENCY CONTACT WHILE ABROAD:

[redacted]

INFORMATION ON YOUR DEPENDENTS

[redacted]

STATEMENT BY APPLICANT

By my name in the box below: (1) I have read and understood all instructions accompanying this application. (2) To the best of my knowledge, the information provided in my application is true, correct, and complete. (3) I understand that any misrepresentation or omission may be cause for withdrawing a recommended status or grant award. In the event I am awarded a grant: (4) I understand that this application and supporting materials will be shared with persons involved in the National Screening Commission review process and with the staff at the U.S. Department of State, Fulbright Commission and U.S. embassy in the country(s) to which I am applying, and others who are responsible for administering the Fulbright Program or involved in the selection process; (5) I agree to accept, as a condition of my award, such placement as is made for me in an educational institution abroad; (6) I agree to keep my supervisory agency informed of my whereabouts and academic progress, and to prepare such reports, both progress and terminal, covering my experience while under the grant as may be requested by my supervisory agency; (7) I understand that in case I fail to maintain a satisfactory record, or in case my conduct is considered prejudicial to the best interest of the international educational exchange program, my award may be withdrawn and payments terminated; (8) I understand that all Fulbright program grants are subject to the Policies of the J. William Fulbright Foreign Scholarship Board; (9) Once submitted, I will no longer have access to any part of the application or supporting materials, including References/Evaluations.

Mike Blazanin 09 / 08 / 2016

Applicant Name (as entered in Fulbright Application) Date

Information on this page is not available to reviewers during the screening process.

STATEMENT OF GRANT PURPOSE
Michael Blazanin, Spain, Biology
Evolution of RNA Viruses in Response to Variable Host Susceptibility

Ebola, Zika, Influenza, West Nile. Infectious pathogens are the greatest global health challenge we face today, and our long-term success depends on our understanding of how they change over time. In particular, many pathogens are a class of viruses which use RNA, rather than DNA, to store their genome. Their success is driven by their incredible ability to quickly adapt to new hosts. In order to reduce the risk posed by future RNA virus outbreaks, it is vital to understand how they evolve, both before and during an epidemic. One factor that has been shown to affect pathogen evolution is the diversity of the host population. I propose to study how the evolution of RNA virus fitness—their ability to infect and replicate—is affected by variation within a host population. I have developed my nine-month plan with Dr. Santiago Elena at the Consejo Superior de Investigaciones Científicas - Universidad Politécnica de Valencia, as a contributing part of a larger study he is undertaking about the effects of host variation on pathogen evolution.

One way that host populations are diverse is in how susceptible individuals are to infection. These differences can lead to stark evolutionary differences: susceptible hosts support larger pathogen populations, creating stronger natural selection that can lead to greater improvement in pathogen fitness. Experimental evolution, where evolution is observed in real-time under controlled conditions, is a powerful approach to reveal these effects. Unfortunately, the artificial conditions of experimental evolution often restrict real-world application. This limitation can be mitigated by plant-virus model systems: plant hosts are complex, with cellular development and immune function, while still being practical to experiment with. We will be utilizing *Arabidopsis thaliana* ecotype Col-0 plants and the turnip mosaic potyvirus (TuMV). Dr. Elena and his laboratory are currently working to identify *A. thaliana* mutants which vary in their susceptibility to TuMV. They will then choose several plant strains to use as hosts, and infect them with TuMV. Every ten days, during which TuMV has been evolving inside the plant, a sample of newly produced viral particles will be taken from the diseased plant and used to infect a new plant. Periodically, a sample of this infectious material will be stored for later work.

When I arrive in Valencia, I will first spend a month gaining technical skills in molecular virology and infectious materials handling. For the rest of my time, I will work with increasing independence, first to purify each of the evolve TuMV strains, then to measure changes in fitness of the TuMV as they evolved. Our hypothesis that more susceptible hosts create stronger natural selection on pathogens generates specific predictions about what the fitness of each evolved virus should be in each different plant host. Most significantly, the difference in fitness between different hosts should be greater for viruses which originally evolved in more-susceptible hosts. To measure the fitness of each virus, I will compete it with a version of the original ancestral TuMV strain which carries a copy of an added protein (TuMV-eGFP). Ten days after infecting a plant with both the virus being tested and TuMV-eGFP, I will use reverse transcription and a real time quantitative polymerase chain reaction to quantify the frequencies of the two viruses. From this data we can calculate the fitness of each evolved strain relative to TuMV-eGFP in each different plant host. Each fitness assay runs for approximately two weeks, after which statistical analysis will be performed, and any failed assays will be re-tested.

Grant Purpose, 2

My project will produce useful data for inclusion in peer-reviewed publications with Dr. Elena, as well as contributing to a grant Dr. Elena has been awarded to study how host population variation affects pathogen evolution. He has been working with RNA virus systems for over 25 years, and leads an established laboratory widely known for high-quality and important work on the evolution of plant RNA viruses. Such a wealth of collective knowledge and experience among all the members of his laboratory will ensure that, no matter what challenges arise, my work will continue to progress and contribute meaningfully to scientific progress.

I will engage with the Spanish culture and community most substantially through my interactions with Dr. Elena, the members of his laboratory, and the broader academic community in Valencia. My working fluency in Spanish will facilitate the creation of close relationships with laboratory members, while attending seminars and other social events will expose me to many other researchers. I also intend on engaging in scientific outreach, either by creating new events for students and the public to see scientific work in action, or by participating in an existing program. Experiences like these immensely shaped my own desire to work in science, and I hope that these opportunities can help inspire others to explore their own scientific interests. Finally, one of my greatest hobbies is playing and designing board games. Board game shops, like the several in Valencia, often hold events and serve as community hubs, and I will use these as a starting point to participate and meet people with whom I can interact with throughout my year.

Spain is the ideal environment for my Fulbright experience for both professional and personal reasons. Spain is a leading member of the global scientific community, ranking eighth in the number of peer-reviewed publications per country. Over the past decade, they have made incredible new investments in their scientific institutions, and in the coming decades of my career their prominence will certainly continue to rise. Furthermore, the issues of pathogen evolution that I want to understand are international challenges, and this fellowship is a chance for me to connect with scientific programs and rising scientists that will yield future global collaborations. Additionally, the approach to scientific research is different in every environment, and research in Spain will expose me to these differences, challenging my existing preconceptions of how to pursue scientific inquiry. Personally, I am also greatly interested in Spanish and European cultures, as well as continuing my development of the language. I would love to be immersed in Spanish society, a unique experience compared to my visits to Latin America. I also will surely take the liberty of visiting and learning firsthand about other European cultures. Finally, this experience would push my Spanish language skills further than they have ever been pushed before. Learning a second language, especially at a high level, provides a fresh way of experiencing the world, even affecting how one thinks, while also providing functional benefits. I want to invest in my Spanish skills so that I can continue to use them in my personal travels and in professional relationships for the rest of my life.

The project I am proposing will answer vital unknowns about how pathogens evolve, which can inform how we prevent and respond to future epidemics, while my experience will shape me deeply, allowing me to create countless connections and grow personally and professionally.

La Declaración del Propósito de la Beca
Michael Blazanin, España, Biología
La Evolución de Virus ARN como una Respuesta de Susceptibilidad Variable del Huésped

La Ebola, la Zika, la Influenza, el Nilo Occidental. Los patógenos infecciosos son el desafío más grande de la salud global hoy, y un futuro exitoso y saludable depende de nuestra comprensión de su evolución a través del tiempo. En particular, muchos patógenos pertenecen a un grupo de virus que usa ARN, en vez de ADN, para guardar su información genética. Su éxito depende de su habilidad para adaptarse rápidamente a nuevos huéspedes. Para reducir el riesgo de brotes de virus ARN en el futuro, es necesario entender cómo evolucionan antes de y durante una epidemia. Se ha demostrado que un factor que afecta la evolución de los patógenos es la diversidad de la población de los huéspedes. Propongo investigar cómo la evolución de la aptitud del virus ARN — su habilidad de infectar y replicar — es afectado por variaciones dentro de una población de huéspedes. He desarrollado mi plan de nueve meses con Dr. Santiago Elena del Consejo Superior de Investigaciones Científicas – Universidad Politécnica de Valencia, como una parte contribuye a una investigación mayor que él está llevado a cabo sobre los efectos de variaciones entre huéspedes en la evolución de los patógenos.

Una manera en que las populaciones son diversas es en las diferencias entre individuos; tales como su susceptibilidad a las infecciones. Estas diferencias pueden crear alteraciones evolutivas significativas: huéspedes más susceptibles sostienen populaciones de patógenos mayores, creando fuerzas de selección natural más fuertes que pueden llevar a mejoras en la aptitud de los patógenos. Evolución experimental, el proceso en que la evolución es observada en tiempo real en condiciones controladas, es una manera efectiva de revelar estos efectos. Desafortunadamente, con frecuencia las condiciones artificiales de evolución experimental restringen las aplicaciones en el mundo real. El uso de sistemas con plantas y virus de plantas puede mitigar esta limitación: plantas que son huéspedes son complejos, con desarrollo celular y funciones inmunes, y es fácil hacer experimentas con ellos. Nosotros vamos a usar *Arabidopsis thaliana* ecotipo Col-0 como nuestra planta huesped y el potyvirus del mosaico del nabo (TuMV). Dr. Elena y su laboratorio están trabajando para identificar *A. thaliana* mutantes que varían en su susceptibilidad al TuMV. De esta manera, ellos seleccionarán algunas plantas para usar como huéspedes, e infectarán las plantas con TuMV. Cada 10 días, en los que el TuMV habrá evolucionado dentro de la planta, ellos tomarán una muestra de los virus nuevos y la usarán para infectar una planta nueva. Ocasionalmente, se guardará la muestra para trabajo en el futuro.

Cuando llegue a Valencia, primero pasaré un mes aprendiendo habilidades técnicas en virología molecular y el manejo de materiales infeccioso. Segundo, pasaré ocho meses trabajando con más independientemente, primero para purificar cada una de las cepas del TuMV, y después para medir la aptitud de las cepas. Nuestra hipótesis establece que los huéspedes más susceptibles crean selección natural más fuerte en los patógenos; esto predice características específicas sobre la aptitud de cada cepa en cada variedad de las plantas. La predicción más importante es que la

La Declaración del Propósito de la Beca, 2

diferencias en aptitud entre huéspedes diferentes debe ser más grande para los virus que evolucionaron en los huéspedes más susceptibles. Para medir la aptitud, comparare cada cepa con una versión del TuMV ancestral que contiene una proteína añadida (TuMV-eGFP). Diez días después de iniciando una infección de una planta con una cepa y el TuMV-eGFP, usaré transcripción invertida y una reacción en cadena de la polimerasa cuantitativa en tiempo real para cuantificar la frecuencia de los dos. Usando esta información, podemos calcular la aptitud de cada cepa contra TuMV-eGFP dentro de cada variedad de planta. Cada prueba dura dos semanas, después de lo cual analizare estadísticamente los datos.

Mi proyecto producirá datos útiles que van a ser incluidos en publicaciones científicas con el Dr. Elena, y también ayudarán con una beca que el Dr. Elena tiene para investigar como la variación entre una población de huéspedes afecta la evolución de los patógenos. Él ha trabajado con virus ARN por más que 25 años, y es el líder de un laboratorio prestigioso, dado la calidad e importancia de su trabajo sobre la evolución de los virus ARN en plantas. Su grupo tiene una abundancia de conocimiento y experiencia entro todos los miembros, y este asegura que, independiente de los problemas que encontremos, mi trabajo continuará y contribuirá al progreso científico.

La manera más importante en la que me dedicaré a la cultura y las comunidades de España es por mis interacciones con el Dr. Elena, los miembros de su laboratorio, y la comunidad científica en Valencia. Mi fluidez en español facilitará la creación de relaciones con los miembros del laboratorio, mientras interactúe con otros científicos cuando asisto a congresos y otros eventos sociales. También, voy a participar en programas de extensión. Si no hay un programa existente, hare eventos nuevos para estudiantes y el público para ver el trabajo de la ciencia. En mi vida, experiencias similares como estos han moldeado mi interés en la ciencia, y espero que estas oportunidades inspiraren a otros a ejercer un interés en la ciencia. Por fin, uno de mis pasatiempos es el juego y diseño de los juegos de la mesa. Las tiendas para juegos de mesa, como aquellos en Valencia, funcionan como puntos de reunión centrales de la comunidad, y las usaré para participar y para conocer personas con las puedo jugar durante mi año en España.

España es el ambiente ideal para mi Fulbright por razones profesionales y personales. España es un líder en la comunidad científica global, octavo en el mundo en número do publicaciones científicas por país. En la última década, ellos han hecho inversiones increíbles en sus instituciones científicas, y en las décadas próximas ellos prometen seguir mejorando. Además, los problemas de la evolución de los patógenos que quiero entender son desafíos internacionales, y esta beca es una oportunidad para crear conexiones con programas científicos y científicos jóvenes, conexiones que puedo usar para colaboraciones futuras. Por consiguiente, el proceso de investigaciones científicas es muy diferente en cada ambiente, y esta experiencia en España me enseñará una manera nueva de estudiar la ciencia. Personalmente, tengo mucho interés en las

culturas de España y de Europa, y también quiero continuar el desarrollo de español. Me encantaría estar sumergido en la sociedad de España, una experiencia única dado mis experiencias en Latinoamérica. También, voy a visitar y aprender sobre otras culturas de Europa. Por fin, pasar un año en España me ayudara a entender el español a un nivel nuevo. El proceso de aprendizaje de un lenguaje secundario proviene una manera nueva de percibir el mundo, cambia como alguien piensa, y provee beneficios funcionales. Me gustaría invertir en mis habilidades del español por el uso de ellos en mis viajes personales y mis relaciones profesionales durante el resto de mi vida.

El propósito de este proyecto será descubrir nuevos datos sobre como los patógenos evolucionan, de qué forma podemos informarnos sobre cómo prevenirlos, y cómo podemos responder a epidemias futuras. Durante el proyecto, mis experiencias me moldearán, facilitando la creación de conexiones y crecimiento personal y profesional.

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

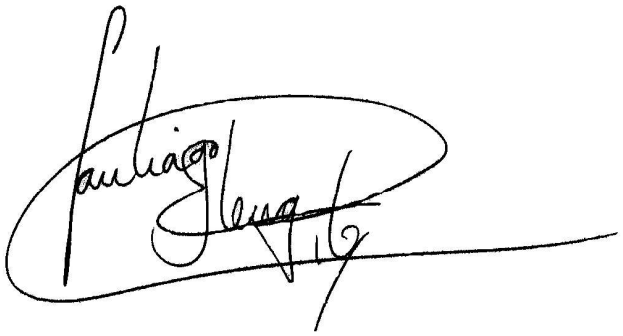
INSTITUTO DE BIOLOGIA MOLECULAR Y CELULAR DE PLANTAS

Valencia, July 5th, 2016

Dear Mr. Blazanin,

It is a great pleasure to me to extent this invitation letter for you to join my laboratory as a Fullbright Research Award fellow starting September 15th 2017 and ending May 15th 2018. This invitation, by no means, imply that me or CSIC will acquire a contractual relationship with you nor that we will allocate any budget to cover your travel, accommodation, salary, nor medical coverage. All these expenses will have to be covered in full by your own budget. However, all expenses derived from your research will be covered from my grants money. CSIC does not ask for bench fees for visiting scholars.

Wishing you all the success in your application. Yours sincerely,



Prof. Santiago F. Elena, PhD
santiago.elena@csic.es
http://bioxeon.ibmcp.upv.es/EvolSysVir
Twitter: @SFElenaLab

Campus UPV, CPI 8E
Ingeniero Fausto Elío, s/n

46022 València

Personal Statement
Michael Blazanin, Spain, Biology
Evolution of RNA Viruses in Response to Variable Host Susceptibility

I was walking out of Physics my freshman year when a love for evolutionary biology snuck up on me. I happened to see an undergraduate showing bacteria that he had experimentally evolved in the laboratory. Until then, I had never considered evolutionary biology as something I wanted to pursue as a career, but seeing evolution occur in real-time ignited my curiosity. The next fall I began volunteering while preparing an undergraduate research grant application. As I wrote my application, I began to feel drawn again and again to the papers I was reading, and I took great pride and ownership in taking ideas from various sources and proposing something entirely novel. I had begun to develop a strong interest in experimental microbial evolution, so when I learned my proposal had been rejected, I was deeply disappointed. Determined to continue, I redirected my research question into virus evolution, clarifying my hypotheses and aims.

During this time, I had also continued learning Spanish, eventually deciding to spend a semester of Spanish immersion in Venezuela, studying biology and doing research. My interest in the Spanish language has always been as a way to communicate with people who would otherwise be inaccessible. While there I completed a research project comparing the plant biodiversity in different ecosystems of the Andes Mountains, and my experiences working with native Spanish-speakers confirmed to me the utility of my Spanish proficiency in facilitating professional collaboration. Studying abroad also eliminated the trepidation I previously had about international travel, sparking a desire to experience and immerse myself in foreign cultures.

When I returned, I continued my research on viral evolution, diving into the preparation of a new undergraduate research proposal. Learning from my rejection, I clearly laid out my hypothesis, its predictions, and how I would test those predictions. I soon received the fantastic news that my proposal had been accepted, and my work led to an opportunity to participate in a National Science Foundation summer research program, where I studied the evolution of a widespread plant pathogen. Over the course of my career, my resolve to perform academic research has greatly strengthened, while my research interests have narrowed. Initially, I was broadly interested in experimental microbial evolution. However, my work at the University of Minnesota has now cultivated a deeper interest in the evolution of viruses, while my project this past summer helped me realize the global importance of plant pathogens, and their utility as models of human pathogens.

Dr. Elena works at the confluence of these interests, studying viral plant pathogens and using them as a model system. My autonomous research experiences have prepared me to work independently, and have built a foundation of necessary laboratory techniques. After my project with Dr. Elena, I will continue to study viral evolution in an evolutionary biology PhD program. In the long run, my goal is to direct research into pathogen evolution as a faculty member while teaching and mentoring undergraduate and graduate students. My work will help inform how we prevent and respond to pathogen outbreaks, and I will continue to collaborate internationally, especially with scientists from the Spanish-speaking world.

La Declaración Personal
Michael Blazanin, España, Biología
La Evolución de Virus ARN como una Respuesta de Susceptibilidad Variable del Huésped

Caminaba desde mi clase de la física cuando vi algo que desato mi interés y amor en biología evolucionaria. Vi a un estudiante exhibiendo bacteria que él había evolucionado de forma experimental en el laboratorio. Antes de eso, nunca había pensado sobre la biología evolucionaria como algo que quería para mi profesión, pero la demonstración de evolución en tiempo real encendió mi curiosidad. El otoño próximo, empecé a trabajar como un voluntario mientras preparaba una propuesta para aplicar una beca de investigaciones científicas para estudiantes. Mientras escribía, mi interés en las publicaciones científicas creció, y el proceso de tomar ideas de fuentes diferentes y combinarlas para producir algo nuevo me lleno de orgullo. También, he desarrollado un interés en la evolución experimental de microorganismos. Por eso, cuando descubrí que mi propuesta había sido rechazada, me decepcioné mucho. Con determinación, redirigí mi investigación a la evolución de los virus, y clarifiqué mis hipótesis y metas.

Durante este tiempo, yo también continuaba mis estudies del español, y decidí pasar un semestre de inmersión en español en Venezuela estudiando biología y haciendo investigaciones científicas. La razón más importante para mi interés en el español es para permitir comunicaciones con nuevas personal y culturas. Mientras estaba en Venezuela, completé un proyecto investigando la biodiversidad de las plantas entre ecosistemas distintas en la Cordillera de los Andes. Mis experiencias trabajando con las personas locales me confirmaron la utilidad de mi competencia en español para facilitar colaboraciones profesionales. Mis estudios internacionales también eliminaron la trepidación que antes sentía, creando un deseo para experimentar culturas extranjeras.

Cuando regresé, continué mi investigación sobre la evolución viral, preparando una propuesta nueva para la beca científica para estudiantes. Apliqué lo que aprendí sobre mi rechazo anterior; como escribir mi hipótesis, mis predicciones, y como podía comprobarlos. Pronto, recibí las noticias buenas que había recibido la beca, y por mi trabajo recibí una oportunidad participar en un programa de investigaciones en el verano, donde estudié la evolución de un patógeno global encontrado en las plantas. Durante mi carrera, mi determinación para trabajar como un profesor ha aumentado, mientras que el rango de mi investigación se ha angostado. Al principio, tenía interés amplio en la evolución experimental de microorganismos. Sin embargo, mi trabajo en la Universidad de Minnesota ha cultivado un interés en la evolución de virus, mientras mi proyecto en el verano pasado me ayudo a entender importancia de patógenos en las plantas, y sus utilidades como modelos de patógenos para humanos.

El Dr. Elena trabaja con una combinación de estos intereses, estudiando virus que son patógenos en las plantas, usándolos como modelo. Mis investigaciones independientes me han preparado para trabajar con independencia, y han construido una fundación de técnicas importantes dentro

La Declaración Personal, 2

del laboratorio. Después de mi proyecto con el Dr. Elena, continuaré investigando la evolución de los virus en un programa doctoral de biología evolucionaria. En el largo plazo, me gustaría dirigir mis investigaciones científicas sobre la evolución de los patógenos con un profesor, mientras enseño y guio a estudiantes. Mi trabajo informará como prevenimos y respondimos a los brotes de patógenos, y continuaré colaborando internacionalmente, especialmente con científicos del mundo hispano.

APPLICANT NAME: Blazanin, Michael
COUNTRY: Spain/SP/WE

FIELD OF STUDY: Biology|2490

FORM 7

FULBRIGHT U.S. STUDENT PROGRAM
Language Self Evaluation

Applicants should complete a separate **Language Self Evaluation** for each language needed for their proposed grant project or as required by the host country according to the Country Summary.

Remember, unless you have no knowledge of the host country language, you must have FORM 8 completed by a foreign language evaluator.

Please answer the following questions regarding the language being evaluated.

1. Language being evaluated: Spanish

2. Indicate if you are applying for the Critical Language Enhancement Award in the language evaluated on this form: ☐ Yes ☒ No

3. Indicate your evaluation of your knowledege/skills level in the language indicated in question 1.

- ☐ None
- ☐ Basic (no formal study or minimal high school)
- ☐ Novice (less than 1 year college or equivalent)
- ☐ Intermediate(1-2 years college or equivalent)
- ☒ Advanced (more than 2 years college or equivalent)
- ☐ Superior (native or near native)

4. Indicate how you have learned the language. You may check all that apply.

- ☒ Formal Study
- ☒ Self-study
- ☐ Mother tongue
- ☐ Spoken at home
- ☒ Studied/lived in country (indicate country & amount of time in question 5)
- ☐ Other

COMMENTS:

5. Indicate amount of time spent in formal study and/or time studying or living in a country where language is spoken and the country

2 1/2 weeks in Costa Rica, traveling the country by bus, 2016
One semester studying & living in Venezuela at study abroad program, also including
language immersion biology classes, Spring 2015
Three semesters formal study as an undergraduate, Fall 2013 - Spring 2015
Five years formal study in middle and high school, 2007-2013

6. If the language used in the host country and/or in your project is not commonly taught in the U.S. and/or you have not enrolled in formal study of the language, indicate what steps you have taken to learn this language to date.

7. If you do not currently have the level of language proficiency necessary to communicate effectively, orally and in writing, in the host country language, indicate what you are doing now and what you plan to do to bring your language facility to an acceptable level by the time a grant would begin.

University of Minnesota Unofficial Transcript

Name :
Student ID :
Birthdate :

Print Date: 10/07/2016

MOST RECENT PROGRAMS

Campus	:	University of Minnesota, Twin Cities
Program	:	College of Biological Sciences
Plan	:	Ecology, Evolution and Behavior B S
Degree Sought	:	Bachelor of Science
Plan	:	Economics Major
Subplan	:	BS Track Emphasis
Plan	:	University Honors Program Major
Plan	:	Microbiology Major
Plan	:	Statistics Minor

Transfer Credits
Transfer Credit from Credit by Advanced Placement (AP)
Semester Transfer Totals: 51.000

* * * * * **Beginning of Undergraduate Record** * * * * *

Fall Semester 2013
University of Minnesota, Twin Cities
College of Biological Sciences
Lower Division Major
Biology Emphasis
University Honors Program
Economics Major
BS Track Emphasis

Course		Description	Attempted	Earned	Grade	Points
BIOL	1805	Nature of Life	0.50	0.50	S	0.000
BIOL	2002H	Foundations of Biology I	6.00	6.00	A	24.000
ECON	3101	Intermediate Micro	4.00	4.00	A	16.000
HSCI	3244	History of Ecology	3.00	3.00	A	12.000
PHYS	1401V	Hnrs Phys I	4.00	4.00	A	16.000
TERM GPA :	4.000	TERM TOTALS :	17.50	17.50	17.00	68.000

Term Honor: Dean's List

Spring Semester 2014
University of Minnesota, Twin Cities
College of Biological Sciences
Lower Division Major
Biology Emphasis
Economics Major
BS Track Emphasis
University Honors Program Major

Course		Description	Attempted	Earned	Grade	Points
BIOL	1806	Nature of Life, Part Two	0.50	0.50	S	0.000
BIOL	2003H	Foundations of Biology II	3.00	3.00	A	12.000
BIOL	2004H	Foundations of Biology II Lab	3.00	3.00	A	12.000
MATH	2574H	Honors Calculus IV	4.00	4.00	A	16.000
PHYS	1402V	Hnrs Phys II	4.00	4.00	A	16.000
SPAN	1003	Intermediate Span	5.00	5.00	A	20.000
TERM GPA :	4.000	TERM TOTALS :	19.50	19.50	19.00	76.000

Term Honor: Dean's List

Term Honor: Academic Year Honors Completed

Summer Semester 2014
University of Minnesota, Twin Cities
College of Biological Sciences
Lower Division Major
Biology Emphasis
Economics Major
BS Track Emphasis
University Honors Program Major

Cancelled

Fall Semester 2014
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
BIOL	2905	Nature of Life, Part III	0.50	0.50	S	0.000
BIOL	2906	Nature of Life, Part IV	0.50	0.50	S	0.000
BIOL	2960H	Exploring Research in Biol Sci	1.00	1.00	A	4.000
CHEM	2331H	Honors Elem Org Chem I	3.00	3.00	A	12.000
EEB	4994	Directed Research	2.00	2.00	S	0.000
MATH	2283	Sequences, Series, Foundations	3.00	3.00	A	12.000
MATH	2573H	Honors Calculus III	4.00	4.00	A	16.000
SPAN	1004	Intermediate Span	5.00	5.00	A	20.000
TERM GPA :	4.000	TERM TOTALS :	19.00	19.00	16.00	64.000

Term Honor: Dean's List

Spring Semester 2015
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
VENZ	3015	Span: Conversation & Comp	4.00	4.00	A	16.000
VENZ	3200	Field Botany in Andes: Spanish	3.00	3.00	A	12.000
VENZ	3264	Sustainable Tropical Ag: ENG	3.00	3.00	A	12.000
VENZ	3407	Tropical Ecology: Spanish	4.00	4.00	A	16.000
COURSES COMPLETED ON THE "STUDY ABROAD IN VENEZUELA" IN MERIDA, VENEZUELA						
TERM GPA :	4.000	TERM TOTALS :	14.00	14.00	14.00	56.000

Term Honor: Dean's List

Fall Semester 2015
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
BIOC	3021	Biochemistry	3.00	3.00	A-	11.001

University of Minnesota Unofficial Transcript

Name :
Student ID :
Birthdate :

Course		Description	Attempted	Earned	Grade	Points
BIOL	3960H	Communicating in Biol Sci	1.00	1.00	A	4.000
CHEM	2302	Org Chem II	3.00	3.00	A-	11.001
EEB	3407	Ecology	3.00	3.00	A	12.000
EEB	4994	Directed Research	2.00	2.00	S	0.000
MICB	3301	Biology of Microorganisms	5.00	5.00	A	20.000
TERM GPA :	3.867	TERM TOTALS :	17.00	17.00	15.00	58.002

Term Honor: Dean's List

Spring Semester 2016
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
BIOL	3272	Applied Biostatistics	3.00	3.00	A	12.000
BIOL	4003	Genetics	3.00	3.00	A	12.000
CSCI	5461	Fun. Gen., Sys. Bio, & Bioinf.	3.00	3.00	A	12.000
EEB	3409	Evolution	3.00	3.00	A	12.000
TERM GPA :	4.000	TERM TOTALS :	12.00	12.00	12.00	48.000

Term Honor: Dean's List

Summer Semester 2016
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
UGRD	4999	Undergraduate Summer Research	0.00	0.00	NG	0.000
TERM GPA :	0.000	TERM TOTALS :	0.00	0.00	0.00	0.000

Fall Semester 2016
University of Minnesota, Twin Cities
College of Biological Sciences
Ecology, Evolution and Behavior B S
Economics Major
BS Track Emphasis
University Honors Program Major
Microbiology Major
Statistics Minor

Course		Description	Attempted	Earned	Grade	Points
BIOC	5361	Microbial Genomics	3.00	0.00		0.000
BIOL	4960H	Biol Thesis: Lit Review	1.00	0.00		0.000
EEB	4994	Directed Research	5.00	0.00		0.000
EEB	8201	Grad. Foundations-EEB, Sem 1	4.00	0.00		0.000
EEB	8500	NSF GRF Proposal Writing	1.00	0.00		0.000
EEB	8990	Graduate Seminar	1.00	0.00		0.000
TERM GPA :	0.000	TERM TOTALS :	15.00	0.00	0.00	0.000

Undergraduate Career Totals

CUM GPA:	3.979	UM TOTALS:	114.00	99.00	93.00	370.002
		UM + TRANSFER TOTALS:		150.00		

- - - - - Non-Course Milestones - - - - -

Second Language Proficiency - Spanish
Milestone Status: Completed

***** End of Transcript *****