

A. COVER PAGE

Project Title: Bicoastal Marmoset Breeding Center	
Grant Number: 5U24MH123423-03	Project/Grant Period: 07/15/2020 - 05/31/2025
Reporting Period: 06/01/2021 - 05/31/2022	Requested Budget Period: 06/01/2022 - 05/31/2023
Report Term Frequency: Annual	Date Submitted: 04/21/2022
Program Director/Principal Investigator Information: XIAOQIN WANG , PHD Phone Number: (410) 614-4547 Email: xiaoqin.wang@jhu.edu	Recipient Organization: JOHNS HOPKINS UNIVERSITY 3400 N. Charles Street BALTIMORE, MD 212182680 DUNS: 001910777 EIN: 1520595110A1 RECIPIENT ID:
Change of Contact PD/PI: NA	
Administrative Official: SHAREL A BROWN 733 N. Broadway Suite 117 Baltimore, MD 212051832 Phone number: 443-927-1678 Email: sbrown80@jhmi.edu	Signing Official: SHAREL A BROWN 733 N. Broadway Suite 117 Baltimore, MD 212051832 Phone number: 443-927-1678 Email: sbrown80@jhmi.edu
Human Subjects: No	Vertebrate Animals: Yes
hESC: No	Inventions/Patents: No

B. ACCOMPLISHMENTS

B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?

The common marmoset (*Callithrix jacchus*) has experienced unprecedented growth in research across the United States and is rapidly emerging as a likely keystone biomedical model system in the next chapter of scientific discovery. Over the past decade, the number of marmoset laboratories in the US has quadrupled. There are now over 40 Principal Investigators who use marmoset as the model system in their research. Neuroscience is the primary engine driving marmoset research today, as nearly three quarters of marmoset researchers in the US use this model species to examine molecular, systems or cognitive functions in normal and diseased brains. Although these grassroots have been successfully forged new paths of scientific inquiry using marmosets in the U.S., critical bottlenecks have emerged that threaten to thwart the continued growth of this emerging model system. We propose to establish a Bicoastal Marmoset Breeding center, with two breeding colonies, one on the East Coast at Johns Hopkins University (JHU) and the other on the West Coast at University of California at San Diego (UCSD). The Center aims to produce a large number of marmosets to supply the marmoset research community in the U.S. Because of the non-availability of air transport of NHP in U.S. and prohibitively expensive ground transportation of NHP between the east and west coast, these two breeding colonies are strategically located to support the marmoset community in regions near each colony. We believe such a center is needed to address the national shortage of marmosets in order for the marmoset model to realize its full potential as a keystone species in the next chapter of neuroscience that serves to accelerate the rate of discovery and better understand human neurological disease.

B.1.a Have the major goals changed since the initial competing award or previous report?

No

B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?

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B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS

For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?

No

B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?

NOTHING TO REPORT

B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?

NOTHING TO REPORT

B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?

JHU colony:

In Year 3, we plan to add 3-5 additional breeding pairs and increase our total number of breeding pairs in the Bayview facility to 15-17 breeding pairs. We will need to purchase additional 5-10 cages to accommodate additional breeding pairs and increasing number of offspring. In addition, we plan to continue genetic testing and designated husbandry studies after further guidance from the Marmoset Coordination Center at OHSU. The genetic testing has gone slower than expected. Lastly,

we expect that by fall 2022 the first set of animals from JHU colony will be available for sale and distribution.

UCSD Colony:

Having established the first 12 breeding pairs at UCSD Elliot Field Station (EFS), our principal aim is to maintain a healthy environment for the animals to breed regularly. Given the steady increase in pregnancies, and most animals having already given birth, we anticipate that the number of healthy marmosets produced at UCSD will continue to increase. Second, we plan to establish 3 additional breeding pairs later this year to have 15 total breeding pairs at the UCSD breeding center by the end of 2022. Lastly, we expect that by fall 2022 the first set of animals from UCSD colony will be available for sale and distribution.

B.2 What was accomplished under these goals?

JHU Colony:

In Year 2, we purchased 10 additional breeding cages and a portable ultrasound machine and x-ray machine to facilitate breeding colony management. We obtained a second housing room to accommodate increased number of animals in our colony. We have also outfit an operating suite in order to support major operative procedures in [REDACTED]. We have established 12 breeding pairs, all of which have started breeding. As of March 2022, there are a total of 40 offspring. By September 2022, we predict to have 27 offspring at the age of one year or older and 13 offspring at the age of less than one year old. We have sent samples to [REDACTED] to facilitate genetic testing of the marmosets.

UCSD Colony:

We had several aims for the second year of the project to establish the breeding colony at the UCSD Elliot Field Station (EFS). First, having established the first 8 pairs of animals, we sought to facilitate these pairs developing regular breeding cycles. All of our initial pairs were young animals ~1.5-3 years of age and none had given birth prior to being paired at EFS. Our first births began in July 2021 and in the first year we had 18 babies born in these initial 8 pairs. However, 11 of these babies were born still-born or died within the first two weeks of life. It is common for marmosets to lose their first set of babies, so this outcome is not entirely unexpected. 7 of these babies, however, were born healthy and are developing normally. Second, we established 4 additional breeding pairs at the EFS in December 2021. The UCSD breeding center now houses 12 pairs of marmosets. At present 8 females at EFS are pregnant. Third, we have placed an order for additional cages to house the anticipated additional breeding pairs that will be added to the breeding center later this year. Fourth, we have sent samples to [REDACTED] to facilitate genetic testing of the marmosets.

C. PRODUCTS**C.1 PUBLICATIONS**

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

No

C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)

NOTHING TO REPORT

C.3 TECHNOLOGIES OR TECHNIQUES

NOTHING TO REPORT

C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization? No

C.5 OTHER PRODUCTS AND RESOURCE SHARING

NOTHING TO REPORT

D. PARTICIPANTS

D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Country	SS
username	Y	WANG, XIAOQIN	PHD	PD/PI	percent effort					NA
	N	Miller, Corey Nicholas	BS,MD,PHD	Co-Investigator						NA
	N	Hutchinson, Eric Kenneth	AB,DVM	Faculty						NA
	N	Izzi, Jessica M	DVM,MOTH,BS	Co-Investigator						NA
	N	Miller, Samantha		Non-Student Research Assistant						NA
	N	Easter, Emma		Non-Student Research Assistant						NA
	N	Dudley, Hana		Technician						NA

Glossary of acronyms:

S/K - Senior/Key

DOB - Date of Birth

Cal - Person Months (Calendar)

Aca - Person Months (Academic)

Sum - Person Months (Summer)

Foreign Org - Foreign Organization Affiliation

SS - Supplement Support

RE - Reentry Supplement

DI - Diversity Supplement

OT - Other

NA - Not Applicable

D.2 PERSONNEL UPDATES

D.2.a Level of Effort

Will there be, in the next budget period, either (1) a reduction of 25% or more in the level of effort from what was approved by the agency for the PD/PI(s) or other senior/key personnel designated in the Notice of Award, or (2) a reduction in the level of effort below the minimum amount of effort required by the Notice of Award?

No

D.2.b New Senior/Key Personnel

Are there, or will there be, new senior/key personnel?

No

D.2.c Changes in Other Support

Has there been a change in the active other support of senior/key personnel since the last reporting period?

No

D.2.d New Other Significant Contributors

Are there, or will there be, new other significant contributors?

No

D.2.e Multi-PI (MPI) Leadership Plan

Will there be a change in the MPI Leadership Plan for the next budget period?

NA

E. IMPACT**E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**

Not Applicable

E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?

NOTHING TO REPORT

E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?

Not Applicable

E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?

NOTHING TO REPORT

F. CHANGES**F.1 CHANGES IN APPROACH AND REASONS FOR CHANGE**

Not Applicable

F.2 ACTUAL OR ANTICIPATED CHALLENGES OR DELAYS AND ACTIONS OR PLANS TO RESOLVE THEM

NOTHING TO REPORT

F.3 SIGNIFICANT CHANGES TO HUMAN SUBJECTS, VERTEBRATE ANIMALS, BIOHAZARDS, AND/OR SELECT AGENTS**F.3.a Human Subject**

No Change

F.3.b Vertebrate Animals

No Change

F.3.c Biohazards

No Change

F.3.d Select Agents

No Change

G. SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

NOTHING TO REPORT

G.2 RESPONSIBLE CONDUCT OF RESEARCH

Not Applicable

G.3 MENTOR'S REPORT OR SPONSOR COMMENTS

Not Applicable

G.4 HUMAN SUBJECTS

Not Applicable

G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

Are there personnel on this project who are newly involved in the design or conduct of human subjects research?

G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 VERTEBRATE ANIMALS

Does this project involve vertebrate animals?

Yes

G.8 PROJECT/PERFORMANCE SITES

Organization Name	DUNS	Congressional District	Address
Primary: JOHNS HOPKINS UNIVERSITY	001910777	MD-007	Johns Hopkins University 733 N Broadway, Suite 117 Baltimore, MD 212051832
JOHNS HOPKINS UNIVERSITY	001910777	MD-007	720 Rutland Ave Traylor 410 BALTIMORE, MD 212052109

The Regents of the Univ. of Calif., U.C. San Diego	804355790	CA-049	University of California San Diego Office of Contract & Grant Admin, 0934 La Jolla, CA 920930934
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G.9 FOREIGN COMPONENT

No foreign component

G.10 ESTIMATED UNOBLIGATED BALANCE

G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

Yes

Estimated unobligated balance: \$321,000

G.10.b Provide an explanation for unobligated balance:
Our unobligated balance is due to delayed invoicing from the UCSD subgrant. They have invoiced us through 2/28/2022 and are working diligently to get billing back on track as soon as possible. We anticipate the balance to be lower by 5/31/2022, if not cleared.

G.10.c If authorized to carryover the balance, provide a general description of how it is anticipated that the funds will be spent
These funds are earmarked for the UCSD subgrant and will be used for that purpose in accordance with the original budget.

G.11 PROGRAM INCOME

Is program income anticipated during the next budget period? No

G.12 F&A COSTS

Is there a change in performance sites that will affect F&A costs?

No

RESEARCH & RELATED BUDGET - SECTION A & B

ORGANIZATIONAL DUNS*: 001910777

Budget Type*: ☒ Project ☐ Subaward/Consortium

Enter name of Organization: JOHNS HOPKINS UNIVERSITY

Start Date*: 06-01-2022

End Date*: 05-31-2023

A. Senior/Key Person

Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1.	Xiaoqin		Wang		Project Lead	base salary & percent effort				26,184.00	7,332.00	33,516.00
2. Dr	Jessica		Izzi		Co- Investigator					38,772.00	10,856.00	49,628.00
Total Funds Requested for all Senior Key Persons in the attached file												
Additional Senior Key Persons: File Name:											Total Senior/Key Person	83,144.00

B. Other Personnel

Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
	Secretarial/Clerical						
3	Veterinarian	percent effort			57,150.00	16,003.00	73,153.00
3	Total Number Other Personnel					Total Other Personnel	73,153.00
Total Salary, Wages and Fringe Benefits (A+B)							156,297.00

RESEARCH & RELATED Budget {A-B} (Funds Requested)

RESEARCH & RELATED BUDGET - SECTION C, D, & E

ORGANIZATIONAL DUNS*: 001910777

Budget Type*: ☒ Project ☐ Subaward/Consortium

Enter name of Organization: JOHNS HOPKINS UNIVERSITY

Start Date*: 06-01-2022

End Date*: 05-31-2023

C. Equipment Description	
List items and dollar amount for each item exceeding \$5,000	
Equipment Item	Funds Requested (\$)*
1. Marmoset caging designed by Tecniplast	73,212.00
Total funds requested for all equipment listed in the attached file	0.00
Total Equipment	73,212.00
Additional Equipment: File Name:	

D. Travel	Funds Requested (\$)*
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Possessions)	2,336.00
2. Foreign Travel Costs	0.00
Total Travel Cost	2,336.00

E. Participant/Trainee Support Costs	Funds Requested (\$)*
1. Tuition/Fees/Health Insurance	0.00
2. Stipends	0.00
3. Travel	0.00
4. Subsistence	0.00
5. Other:	0.00
0 Number of Participants/Trainees	Total Participant Trainee Support Costs
	0.00

RESEARCH & RELATED Budget (C-E) (Funds Requested)

RESEARCH & RELATED BUDGET - SECTIONS F-K

ORGANIZATIONAL DUNS*: 001910777

Budget Type*: ☒ Project ☐ Subaward/Consortium

Enter name of Organization: JOHNS HOPKINS UNIVERSITY

Start Date*: 06-01-2022

End Date*: 05-31-2023

F. Other Direct Costs		Funds Requested (\$)*
1. Materials and Supplies		23,644.00
2. Publication Costs		0.00
3. Consultant Services		0.00
4. ADP/Computer Services		0.00
5. Subawards/Consortium/Contractual Costs		0.00
6. Equipment or Facility Rental/User Fees		0.00
7. Alterations and Renovations		0.00
8. Animal Purchase		65,890.00
9. Animal Care		210,856.00
10. Sub contract		274,233.00
Total Other Direct Costs		574,623.00

G. Direct Costs	Funds Requested (\$)*
Total Direct Costs (A thru F)	806,468.00

H. Indirect Costs			
Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base (\$)	Funds Requested (\$)*
1. Indirect	63.75	459,024.00	292,628.00
Total Indirect Costs			292,628.00
Cognizant Federal Agency			
(Agency Name, POC Name, and POC Phone Number)			

I. Total Direct and Indirect Costs	Funds Requested (\$)*
Total Direct and Indirect Institutional Costs (G + H)	1,099,096.00

J. Fee	Funds Requested (\$)*
	0.00

K. Budget Justification*	File Name:
	(Only attach one file.)

RESEARCH & RELATED Budget {F-K} (Funds Requested)