Antarctic Bursary Report

Dear Committee:

Thank you for your generous grant. The Antarctic Bursary awarded me a grant of $\pounds 4,600$ to use towards fieldwork expenses to collect the samples necessary to a robust data set of the bacterial environment for gentoo penguins (*Pygoscelis papua*) that will allow for a more robust comparison between disease, immune function, and population structure for my PhD research.

As mentioned in my proposal, this work is building upon the findings in Levy et al 2020, that found important immunological differences between gentoo penguin populations north and south of the polar front. The majority of the fund awarded was used to conduct field work along the Scotia Arc, including the opportunity to collect samples on Heroina Island in



Sample collection of Adélie colony at Heroina, Danger Islands.

the Danger Islands, Antarctica, a rare occurrence due to the difficulty to land there and the opportunity to collect samples from a mixed pygoscelid species colony. Money was also used for the training necessary to conduct this work safely, including STCW (Standards of Training, Certification, and Watchkeeping) certification for working on ships and Advanced Wilderness Medical Training. This training ensured the maintenance of high safety standards in the work.

The initial work for this project has now been completed, and the remaining funds from the grant are being expended (as per request sent on 02/08/2022) to purchase the extraction kits and PCR re-agents necessary to process further samples, including those from the field work funded by this grant. I have included a full accounting of the funds at the end of this report. I hope that all associated molecular work,

including the purchasing of materials with the remaining funds, will be complete by the summer of 2023.

Initial results looking at the microbiome, the bacteria associated with, here, the digestive tract, of penguins have not supported any evidence for clear differences across latitudes, including those suggested by earlier research by Levy. However, there is evidence for an important role of colony in determining microbiome. There is also initial evidence for an association between tapeworms and microbiome. A paper is currently being prepared for submission that will report on the general importance of colony in penguin microbiomes and documenting how both diet and microbiome follow a general isolation by distance model. Ultimately, this study, which encompasses 25 different colonies and over 350 samples provides a basis for understanding how microbiomes in penguins vary with ecological conditions. This will be especially important with the



Gentoo penguin at Cuverville Island.

rapid climatic change anticipated in Antarctica that will influence both the prey species of penguins and penguins themselves.



Camera monitoring Adélie colony at Heroina, Danger Islands.

Of particular interest is the fact that, while latitudinal differences were not found in the study, there were several other ecological factors that were associated with differences in microbiomes, including the colony from which the samples were collected and the amount of krill in the sample. I hope that the inclusion of samples whose collection was funded by this grant will allow for a more robust test of factors including year and will contribute to re-testing the impact of latitude in a larger dataset, to verify our initial null results. The final portion of the money has been allocated for processing an additional 400 samples that will specifically build on this work, looking at mixed and single species colonies for differences in the microbiome and evaluating the connection between tapeworms and similar intestinal parasites on microbiomes.

I trust that this report will be received positively by the committee and match your expectation. I remain available for any complement of information needed.

	CATEGORY	DATE	AMOUNT
INCOME			
	Antarctic Science Bursary	May-21	£4,600.00
	Total income		£4,600.00
EXPENSES			
	Return flight to Antarctica	2021	£2,500.00
	STCW training for fieldwork	2021	£238.00
	STCW complement training	2021	£608.00
	Fieldwork expenses	2021	£294.00
	Field ready medical check-up	2021	£120.00
	Expedition medical training	2021	£450.00
	Accumulated VAT		£122.00
	Total expenses		£4,332.00
UNDERSPENT			£268.00

Sincerely, Chloe Kaczvinsky

Financial Report. Please note the flight is an estimate as this is still being processed.