STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step II

Funding Criteria

A. General Rules

1. Students, faculty, and staff are encouraged to submit requests for funding. Student-led projects require a faculty or staff sponsor in order to have funds awarded.
2. Funding can only go to university-affiliated projects from students, faculty, staff, and departments.
3. All SSC projects must make a substantial impact on students. This may be a direct impact or an impact through education and engagement. All SSC funding is 100% from student green fees, so the projects funded by the students must benefit them.
4. SSC encourages innovation and new technologies – creative projects are encouraged to apply.
5. Unless a type of expense is specifically listed below as having restrictions, SSC can generally fund it. The items referenced below should not be taken as comprehensive list.

B. Things SSC Can Fund, On A Case-By-Case Basis

1. SSC can fund feasibility studies and design work; however, it must work toward ultimately addressing a sustainability need on campus.
2. SSC can fund staff positions that are related to improving campus sustainability. Strong preference will be given to proposals receiving matching funding from departments and/or plans for maintaining continuity of the position after the end of the initial grant.
3. SSC can fund outreach events with a central theme of sustainability, provided their primary audience is the general campus community.
4. SSC discourages funding requests for food and prizes but will consider proposals on a case by case basis that prove significant reasoning.
5. SSC can fund repairs and improvements to existing building systems as long as it works toward the goal of improving campus sustainability; however, a preference is shown to projects utilizing new or innovative ideas.
6. SSC can provide departments with loans for projects with a distinct payback on a case by case base. Loans will require a separate memorandum of understanding between SSC and departmental leadership pledging to repay the award in full and detailing the payback plan.

C. Things SSC Will Not Fund:

1. SSC will not fund projects with a primary end goal of generating revenue for non-University entities.
2. SSC will not fund personal lodging, food, beverage, and other travel expenses.
3. SSC will not fund any travel expenses.
4. SSC will not fund tuition or other forms of personal financial assistance for students beyond standard student employee wages.

Your Step 2 funding application should include this application, the supplemental budget form, and any letters of support.

Please submit this completed application and any relevant supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact the Student Sustainability Committee at sustainability-committee@illinois.edu.

General & Contact Information

Project Name: Establishing high-efficiency cold storage capacity for the Miller lab.
Total Amount Requested from SSC: $30,691.36

Project Topic Areas: ☐ Land & Water ☐ Education ☒ Energy
☐ Transportation ☐ Food & Waste

Applicant Name: Dan Miller
Campus Affiliation (Unit/Department or RSO/Organization): Department of Evolution, Ecology and Behavior
Email Address: millerdj@illinois.edu

Check one:

☒ This project is solely my own ***OR***

☐ This project is proposed on behalf of (name of student org., campus dept., etc.):

Project Team Members

Name	Department	Email
Dan Miller (PI)	Evolution, Ecology and Behavior	millerdj@illinois.edu
Name		
Name	Department/Organization	Email Address
Name	Department/Organization	Email Address

Student-Led Projects (Mandatory):
Name of Faculty or Staff Project Advisor:
Advisor's Email Address:

Financial Contact *(Must be a full-time University of Illinois staff member)*
Contact Name: Penny Broga
Unit/Department: School of Integrative Biology
Email Address: broga@illinois.edu

Project Information

Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.

Please provide a brief background of the project, its goals, and the desired outcomes:
You may copy and paste your Step 1 application answer if nothing has changed.

Purchasing energy efficient options saves the lab nearly $15,000 dollars over 20 years (see attached graphs). The overall goal of research in the Miller Lab is to understand the evolution of cellular organization in the brain. We combine traditional histological methods and advanced computational methods to integrate measurements of brain structure and function from the level of single-cell transcriptomics and deep-learning morphometrics through single-unit receptive fields mapping to parcellation and tractography using ultra high field MRI to create holistic maps of the brain. We are specifically interested in understanding the fundamental organization of the cerebral cortex as a laminated feature of the mammalian brain in order to develop and validate the biomarkers of neurophysiological organization needed to understand the evolutionary history of the human brain, as well as to identify injured and diseased from healthy tissue. We will be collecting brain samples from humans (i.e. brain banks), mice, rats, and birds for molecular and histological analyses and to store samples at 4C, -20C, and -80C. The storage of these samples would allow comparative and longitudinal analyses of brain development and regeneration after injury. These data are extremely valuable, and these samples require careful handling (molecular work requires ultra-low freezers), placing great emphasis upon high quality sample and reagent preservation.

- Single cell RNA-sequencing requires -80C
- Conventional and molecular histological reagents and samples require 4C and -20C

Where will the project be located? Are special permissions required for this project site?
If special permission is required for this location, please explain and submit any relevant letters of support with the application.

The freezers and fridge will be kept in the Miller lab on the 6th floor of Morrill Hall. No special permissions are required.

Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that benefit from this project.
Please attach letters of commitment or support at the end of the application.

The Miller lab is currently supported by Miller start-up funds since 2020. The Miller lab will also hold samples from colleagues in the Department of Evolution, Ecology and Behavior, the Institute of Genomic Biology, the Beckman Institute for the Advancement of Science, and Carle Hospital, thereby benefitting from this project. Other stakeholders include the numerous undergraduate and graduate students who carry out research projects in the Miller lab, and those associated with our projects throughout the UIUC campus and Carle Hospital.

How will this project involve and/or benefit students?
This includes both direct and indirect impact.

The Miller lab is currently training about a dozen undergraduate researchers (n=14), most of whom intend on pursuing careers in science and graduate school (many look to medical school). Many undergraduate students in the Miller lab have come from groups under-represented in science, and/or are first generation college students. Furthermore, the Miller lab is currently training 2 PhD students, who often help train our undergraduates. Current undergraduate students play a critical role in the lab of collecting data for our deep learning pipeline and they earn research credits for their projects. Some complete research projects for graduation with distinction and some plan to complete honor theses under the supervision of the lab. The freezers and fridge are not only critical for the success of the research in the lab, but also the research projects led by students, including our ability to let students pursue their own ideas.

How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?

Support from the SSC will be advertised in the Miller lab on the 6th floor of Morrill Hall. Furthermore, scientific talks and posters presented at conferences lab members present will acknowledge the support from the SSC. Acknowledgements sections for presentations and publication by the Miller lab will include the SSC name and/or logo. Moreover, we will feature the SSC name and logo on our freezers and fridges. Information about this project will be reported to the Department of Evolution, Ecology and Behavior and the School of Integrative Biology.

Financial Information

In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee website. Submission of both documents by the submission deadline is required for consideration of your project.

Have you applied for funding from SSC before? If so, for what project?

No

If this project is implemented, will you require any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?
Please note that SSC provides funding on a case by case basis annually and should not be considered as an ongoing source of funding.

Additional funding for the project will not be needed because the utility costs for Morrill Hall are paid by the College of LAS. Our request is to purchase energy efficient cold storage that will reduce the cost of utilities for our building.

Please include any other obtained sources of funding. Have you applied for funding elsewhere?
Please attach any relevant letters of support as needed in a separate document.

No other sources of funding are available. The total cost of the 4 degrees refrigerator is $5,865.00, the cost for the -20 freezer is $7,891.20, and the cost for the -80 freezer is $16,935.16, for a total of $30,691.36. We are asking for $30,691.36 from the SSC to help us meet campus sustainability goals.

Environmental, Economic, and Awareness Impacts

How will the project improve environmental sustainability at the Urbana-Champaign campus? If applicable, how does this project fit within any of the Illinois Climate Action Plan (iCAP) goals?

The latest technology offers considerable improvements in energy efficiency compared to their predecessors. For example, we propose purchasing high performance energy efficient Thermo Scientific fridges and freezers, which have the following advantages:

- Uses less than 8 kWh/day
- Produces less environmental heat emissions and lowers HVAC costs
- SNAP compliant, natural hydrocarbon refrigerants, environmentally- friendly, water-blown foam insulation
- HIPAA compliant

The units are EPA ENERGY STAR® certified. While conventional refrigerant, ultra-low freezers can run at very high kWh/day in energy usage, the TSX Series by comparison has been designed to reduce energy usage without compromising performance.

Another important feature of the new model is the SNAP Compliant Hydrocarbon Coolant, which is much safer for the environment. The viscosity of hydrocarbon refrigerant is much less so doesn't take as much force to drive through compressor or refrigerant lines resulting in (1) Lower Operating Temperature; (2) Lower Operating Pressures; (3) Less Friction. The overall effect is a lower heat and noise producing cold storage.

This project will therefore contribute to meeting energy goals as part of the Illinois Climate Action Plan, specifically by building energy conservation. We have included graphs depicting how over time our energy efficient options save money. Specifically, we estimate that these energy efficient options will save approximately $15,000 dollars over 20 years (see graphs).

How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?
Some examples include carbon emissions, water conservation, green behavior, and reduced landfill waste.
We are a new lab, hence we need the fridges and freezers to store samples and reagents. We seek energy-efficient cold storage options to conserve energy consumption over both the short and long term by initially purchasing highly energy efficient appliances that will help us minimize our environmental impact.

What are your specific outreach goals? How will this project inspire change at UIUC?
Our goal is to help reach the benchmarks set by the Illinois Climate Action Plan. This project will contribute to ongoing sustainability work on energy conservation in our lab and the entire Morrill Hall building.

If applicable, how does this project impact environmental injustice or social injustice?
The Miller lab is committed to broadening participation in science and is currently training many undergraduate students, many of whom are from underrepresented groups and/or first-generation college students. Our work on the organization of the cerebral cortex and changes to brain following lesions has important societal implications and our lab is committed to education and research to promote socially-informed understanding and awareness of how mistaken ideas about how brain organization influences behavior and cognitive abilities are used to fuel inequalities.

Figure 1. Refrigerator (4C) Cost and Energy Consumption Analysis. Vertical (Y) axis depicts energy consumption as cost in dollars, over time as depicted on the horizontal (X) axis in years. Arrow indicates selected model in quote for highest efficiency option possible. Colors are as follows: Light gray is LSR, Dark red is VWR, Dark gray is B-Medical Systems, and Light red is Thermo-Scientific. 20 year savings is nearly $7,000.

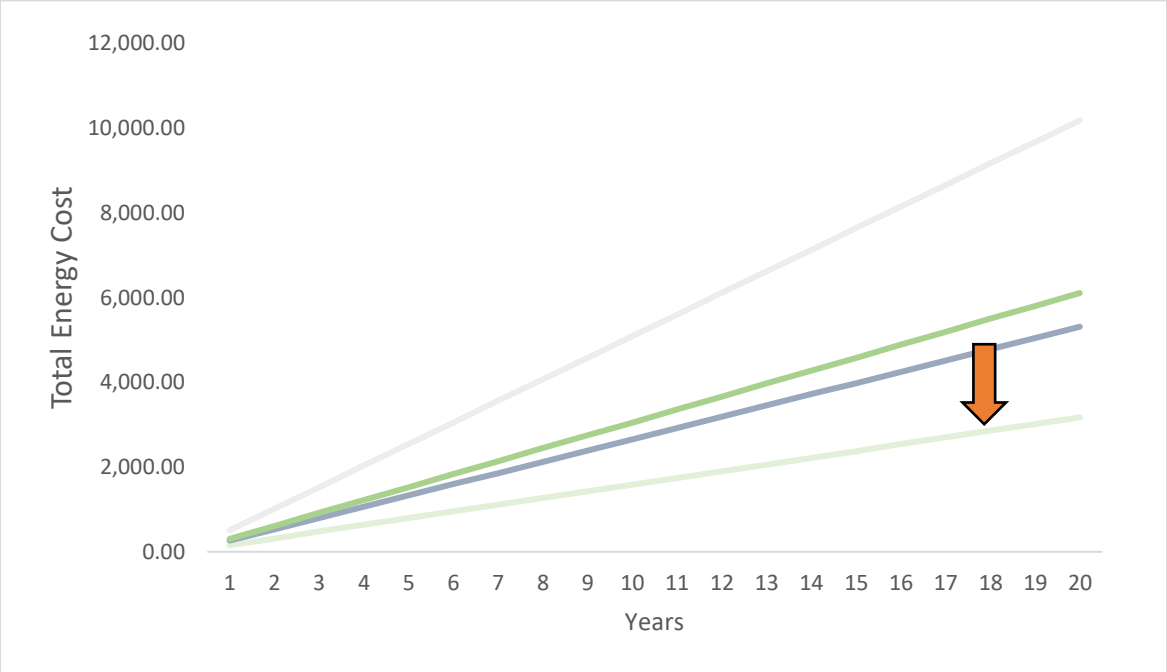


Figure 2. Freezer (-20C) Cost and Energy Consumption Analysis. Vertical (Y) axis depicts energy consumption as cost in dollars, over time as depicted on the horizontal (X) axis in years. Arrow indicates selected model in quote for highest efficiency option possible. Colors are as follows: Dark gray is Horizon, Yellow is Holland Green Science, Light gray is LSR, and Light red is Thermo-Scientific. 20 year savings is nearly $3,000.

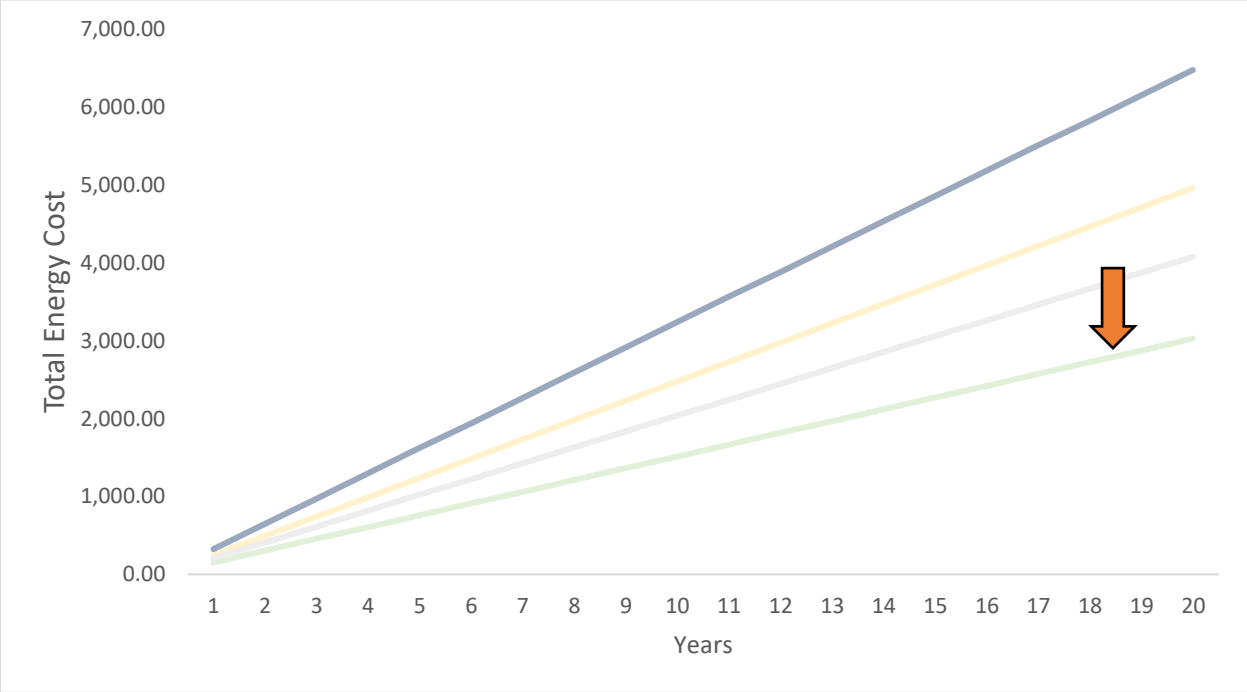
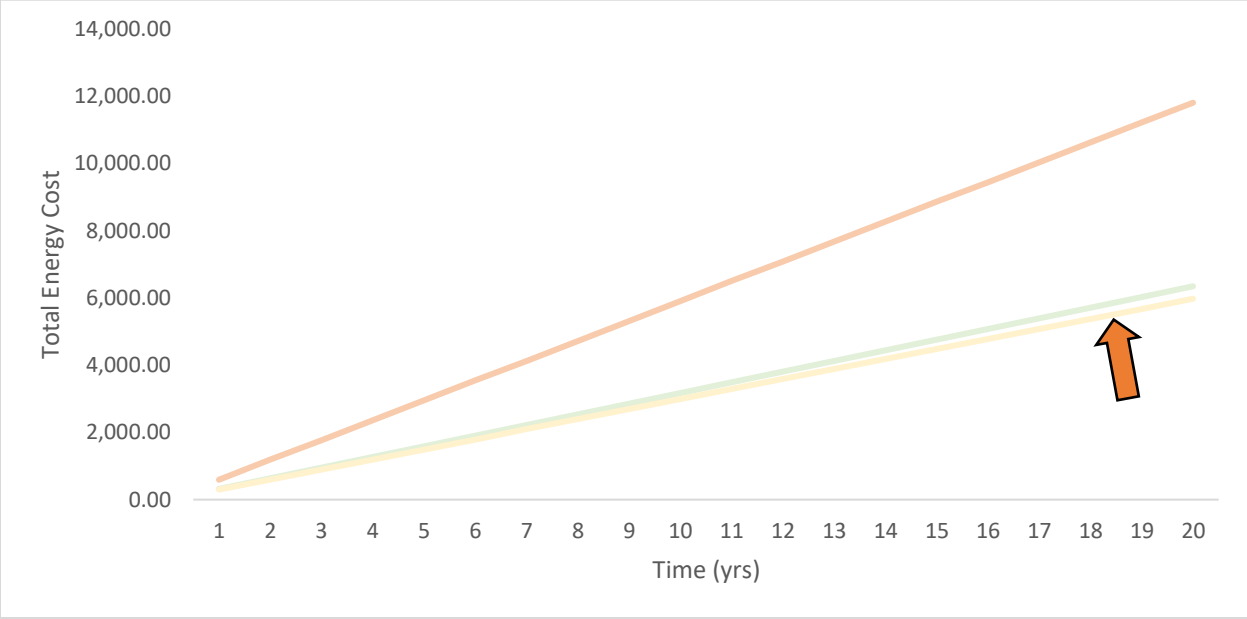


Figure 3. Freezer (-80C) Cost and Energy Consumption Analysis. Vertical (Y) axis depicts energy consumption as cost in dollars, over time as depicted on the horizontal (X) axis in years. Arrow indicates selected model in quote for highest efficiency option possible. Colors are as follows: Dark green is K2 Scientific, Light gray is VWR, and Light yellow is Thermo-Scientific. 20 year savings is nearly $5,000.



STUDENT SUSTAINABILITY COMMITTEE

Step II Application

Please submit this completed application and supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact SSC at Sustainability-Committee@illinois.edu.

GENERAL INFORMATION

Project Title: Establishing high-efficiency cold storage capacity for the Miller Lab

tal Amount Requested from SSC: $30,691.36

Amount Requested as: GRANT (LOAN or GRANT)

SCOPE, SCHEDULE, AND BUDGET VERIFICATION

If the project required you to obtain information from Facilities & Services Planning Division, please ir

Scope & Schedule

What is the plan for project implementation? Describe the key steps of the project including the

Task	frame (# of weeks to comple	Estimated Completion Date

Budget

List all budget items for which funding is being requested under the appropriate category in the

Item	Cost Per Item	Quantity	Total Request

Equipment & Construction Costs

4C Refrigerator	$5,865.00	1	$5,865.00
-20C Freezer	$7,891.20	1	$7,891.20
-80C Freezer	$16,935.16	1	$16,935.16
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$30,691.36

Publicity & Communication

			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

Personnel & Wages

			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

Project Budget per F&S

			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

General Supplies & Other

			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

TOTAL BUDGET	**$30,691.36**

End of Application

Fisher Scientific

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To: DAN MILLER

Date: 01/13/2023

Message: FREE SHIPPING INCLUDED

ITEMS COVERED UNDER PRENEGOTIATED CONTRACT IPHEC 1809

Sales Quotation

*Quote Nbr	Creation Date	Due Date	Page
3013-5461-65	01/13/2023		1 of 1

Payment Terms	Delivery Terms
NET 30 DAYS	DEST
Valid To	Prepared By
05/13/2023	KADONSKY, JAMIE
Customer Reference	Sales Representative
MILLER - 1/13/23	JAMIE KADONSKY

To place an order	Ph: 800-766-7000	Fx: 800-926-1166

Submitted To:	Customer Account: 383060-001
DAN MILLER JAMIE.KADONSKY@THERMOFISHER.COM	UNIVERSITY OF ILLINOIS MUST CHANGE ADDRESS FOR EACH ORDER URBANA IL 61801

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4500 TURNBERRY DRIVE
HANOVER PARK IL 60133-5491

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Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
1	1	EA	TSX2305GARP	TSX RF GLS 23CF 120V/60H PROMO	5,865.00	5,865.00

Thermo Scientific TSX Series High-Performance Refrigerator with Glass Door, NEMA 5-15 PROMO, Amperage: 15 A, Capacity: 23 ft.3, 650 L, Certifications/Compliance: UL, ENERGYSTAR, cUL, Defrost: Automatic, Display: Microprocessor, Door Style: Glass, Monitoring Options: Alarm, Recorder, No. of Doors: 1
Vendor Catalog # TSX2305GARP
Hazardous Material
This item is being sold as 1 per each

MERCHANDISE TOTAL 5,865.00

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To: DAN MILLER

Date: 03/30/2023

Message: FREE SHIPPING INCLUDED

ITEMS COVERED UNDER PRENEGOTIATED CONTRACT IPHEC 1809

Sales Quotation

*Quote Nbr	Creation Date	Due Date	Page
3089-7088-97	03/30/2023		1 of 1

Payment Terms	Delivery Terms
NET 30 DAYS	DEST
Valid To	Prepared By
07/28/2023	KADONSKY, JAMIE
Customer Reference	Sales Representative
MILLER - 3/30/23	JAMIE KADONSKY

To place an order	Ph: 800-766-7000	Fx: 800-926-1166

Submitted To:	Customer Account: 383060-001
DAN MILLER JAMIE.KADONSKY@THERMOFISHER.COM	UNIVERSITY OF ILLINOIS MUST CHANGE ADDRESS FOR EACH ORDER URBANA IL 61801

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Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
1	1	EA	TSX2320FA	TSX FRZ MANUAL 23CF 120V/60HZ	7,891.20	7,891.20

Thermo Scientific TSX Series High-Performance -20 deg.C Manual Defrost Freezer, NEMA 5-15, Plug Type: NEMA 5-15, Electrical Requirements: 115 V 60 Hz, Dimensions Interior: 28.5 x 24 x 58 in. (72.3 x 61 x 147.3 cm), Amperage: 4.3 A, Capacity: 23 cu. ft., 650 L
Vendor Catalog # TSX2320FA
Hazardous Material
This item is being sold as 1 per each
|==========
| Extended warranty available for purchase below:
| 14 259 180 EXTENDED WARRANTY BASIC LR/F $840.00
|==========

MERCHANDISE TOTAL 7,891.20

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http://survey.medallia.com/fishersci

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To: DAN MILLER

Date: 02/20/2023

Message: FREE SHIPPING INCLUDED

ITEMS COVERED UNDER PRENEGOTIATED CONTRACT IPHEC 1809

Sales Quotation

*Quote Nbr	Creation Date	Due Date	Page
3051-6252-30	02/20/2023		1 of 2

Payment Terms	Delivery Terms
NET 30 DAYS	DEST
Valid To	Prepared By
06/20/2023	KADONSKY, JAMIE
Customer Reference	Sales Representative
MILLER - 2/20/23	JAMIE KADONSKY

To place an order | Ph: 800-766-7000 | Fx: 800-926-1166

Submitted To:	Customer Account: 383060-001
DAN MILLER JAMIE.KADONSKY@THERMOFISHER.COM	UNIVERSITY OF ILLINOIS MUST CHANGE ADDRESS FOR EACH ORDER URBANA IL 61801

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Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
1	1	EA	TSX60086DQ4	TSX60086D208-230V/50-60HZ PM	14,016.87	14,016.87
				Thermo Scientific TSX ULT 600-box D-Volt PROMO, Amperage: 4/10 A, Capacity: 28.8 cu. ft., 816 L, Certifications/Compliance: cULus, ENERGYSTAR, Defrost: Manual, Display: Touch-Screen LCD, Holds: 600 2-inch boxes Vendor Catalog # TSX60086DQ4 Hazardous Material This item is being sold as 1 per each		
2	12	EA	1950520	SIDE RACK 25-2 BX 4 DOOR	243.18	2,918.16
				Thermo Scientific Racks for Forma 88000 and TSU Series Freezers, Description: Adjustable Side Access Rack, For Use With: 2 in. boxes, Holds: 2 in. Boxes, Side Access Rack (Adjustable), Depth: 26.5 in., 67.3 cm, Height: 10.9 in., 27.7 cm, Width: 5.4 in., 13.7 cm Vendor Catalog # 1950520 This item is being sold as 1 per each		
3	12	EA	1950520	SIDE RACK 25-2 BX 4 DOOR	.01	.12
				Thermo Scientific Racks for Forma 88000 and TSU Series Freezers, Description: Adjustable Side Access Rack, For Use With: 2 in. boxes, Holds: 2 in. Boxes, Side Access Rack (Adjustable), Depth: 26.5 in., 67.3 cm, Height: 10.9 in., 27.7 cm, Width: 5.4 in., 13.7 cm Vendor Catalog # 1950520 This item is being sold as 1 per each		

MERCHANDISE TOTAL 16,935.15

Sales Quotation

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Quote Nbr	Customer Reference	Page
3051-6252-30	MILLER - 2/20/23	2 of 2

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http://survey.medallia.com/fishersci