Rochester Academy of Science

BULLETIN

"An organization of people in the Natural Sciences"

April 2022; Vol. 76, #4

President's Message

The Rochester Academy of Science Annual Meeting & Spring Lecture is Thursday, April 14, 7:15 p.m.

Please join your Academy colleagues for the RAS Annual Meeting and Spring Lecture on April 14th on Zoom. Our meeting will include the election of board members. Details on the meeting and the Zoom link can be found at https://rasny.org/ras-annual-meeting.

Following the business meeting we turn to our guest speaker, Dr. John O'Shea, for his presentation on "Central Oregon obsidian from a submerged early Holocene archaeological site beneath Lake Huron." Details about the lecture and the background of the speaker can be found in the March Bulletin or at https://rasny.org/ras-annual-spring-lecture. The public is invited to attend this free lecture.

Ballot and voting instructions, including for an emailed proxy ballot are on page 2.

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New RAS Web Site

On behalf of your board of directors, I am thrilled to announce that after much effort by your officers and directors, the Rochester Academy of Science finally has a brand-new website. Using the latest technologies, we have replaced the previous obsolete and difficult to maintain version. The site is still at our usual URL, https://rasny.org/. It has greatly expanded features and content especially for our sections, including links to the ASRAS website. It is much more inviting for the public.

I invite you to explore it. We welcome any suggestions on features and material that the Academy should present on this website.

We offer our grateful thanks to Paul Dudley who has served as RAS webmaster for decades and worked with incredibly difficult technology and design to keep this going.

Director Michael Richmond now serves as our new webmaster and did much of the work to create the new platform. This was a team effort, and it is very gratifying to see it finally completed.

Michael Grenier, RAS President

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Notice
All-Academy
Annual Business Meeting
7:15 p.m., Thursday, April 14, 2022
On Zoom, instructions at
https://rasny.org/ras-annual-meeting
Agenda: Welcome, Election, Financial Report, Lecture

Rochester Academy of Science
Spring Lecture
presented by Dr. John O'Shea

University of Michigan Professor of Anthropology & Curator, Great Lakes, Museum of Anthropological Archaeology

Central Oregon obsidian from a submerged early Holocene archaeological site beneath Lake Huron

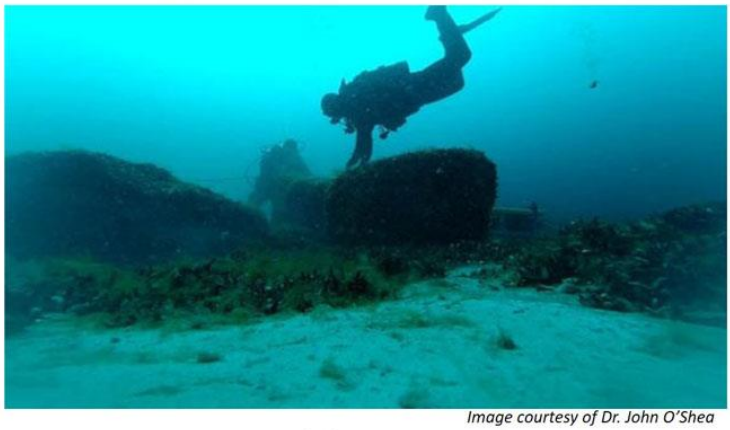


Image courtesy of Dr. John O'Shea

Public Lecture
7:30 p.m. ▫ Thursday, April 14, 2022▫ Free
Meeting of Members at 7:15 p.m.

Rochester Academy of Science Treasurer's Report of April 2022

The Rochester Academy of Science has three categories of funds: the general fund, the endowment funds, and the expendable funds. The general fund receives membership dues and monthly interest from the Life Fund (endowment) and the Memorial Fund (endowment). This financial report does not include income and expenses of the individual sections.

Revenue and Expenses for 2021:
Revenue: Member dues = $5,100, Gifts $3,097, Interest and dividends = $3,265. Total revenue = $ 11,462.
Expenses Summary:

Room rental (ASRAS)	$250.00
Bulletin: printing, mailing, labor	1,531.00
General Office Expenses (PO Box, mail permit, & website)	134.00
Liability Insurance	661.00
Student Grants	2,316.00
Lectures (honoraria + room rental)	625.00
Total (excluding transfers)	$7,184.00

Endowment Funds: The endowment funds are not spent but generate interest, which is entered as income into the three Expendable Funds. They are reported to the IRS as restricted assets.

Fund	Balance (12/31/2020)	Interest Supports
Fairchild Fund	$10,741.00	Publications
Life Fund (Life Membership dues)	$13,000.00	General Fund
Jensen Fund	$8,275.00	Student Grants
Speakers Fund	$6,550.00	Lectures
Grace Murray Fund	$8,250.00	Student Grants
Memorial Fund (named memorial gifts)	$650.00	General Fund
Grants Program Endowment	$10,000.00	Student Grants
Herbarium Endowment	$ 2,000.00	Herbarium
Babette Coleman Bequest	$ 4,958.86	Herbarium
Balance of the Endowment Funds	$64,424.86	

Expendable Funds: (reported to the IRS as unrestricted assets, each are self-supporting and do not receive funds from membership dues or from the General Fund.)

Publications Fund: used to publish the Proceedings and Academy booklets.
Grants Fund: used to award annual research grants to undergraduate college students.
Lecture Fund: used to pay the expenses and honoraria for invited speakers who give lectures at Academy events (the Fall Scientific Paper Session and the Spring Lecture).

Assets and Liabilities: The assets of the Rochester Academy include money held by each of the five sections, as well as the RAS funds in the Pittsford Federal Credit Union (checking, savings) plus investments held by Morgan Stanley/Smith Barney (which pay about 3%; this interest is deposited into the Expendable Funds accounts). The RAS also owns stock in ConocoPhillips and Phillips 66; the dividends received are deposited into the Grants Fund. Finally, RAS has investment money in the UBS Putnam Diversified Income Trust which was a bequest from the Babette Coleman estate. The RAS also owns the Astronomy Section observatory in Ionia, NY. The RAS has no liabilities.

At the upcoming RAS Annual Meeting and Spring Lecture at 7:15 pm on Thursday April 14th, 2022, the RAS annual election will be conducted. Please show us your support by voting for your directors and officers.

ROCHESTER ACADEMY OF SCIENCE
BALLOT FOR JUNE 2022 – MAY 2023 OFFICERS

OFFICE	NAME	√	WRITE-IN CANDIDATE
President:	Michael Grenier		
Vice President:	Daniel Krisher		
Treasurer:	William Hallahan, Ph.D.		
Secretary:	Helen Downs Haller, Ph.D.		
Member, Board of Directors (2022-2025)	Jeff Gutterman, P.E.		
Member, Board of Directors (2022-2025)	Anthony Golumbeck		

Mail your completed ballot to: RAS, P.O. Box 92642, Rochester NY 14692-0642.

You will be able to vote at the meeting through the Zoom chat function, but this is unwieldy. You may prefer to send in a ballot by email and have our Receiver vote it for you as your proxy. You will find the proxy directions and form on our new website at https://rasny.org/ras-annual-meeting just below the meeting details.

If you have NOT renewed your membership for 2022, you must do so for your vote to count. visit https://rasny.org/how-to-join.

Events for April 2022

For updates to events, check the Academy website http://www.rasny.org and section websites.

No Mineral Section Meeting This Month.
See you at the virtual Mineralogical Symposium April 8-10.

1 Fri: Astronomy Members Meeting
7:30 p.m. – 10:00 p.m. RIT Carlson Center for Imaging Science, CAR- 1125. Parking Lot F. Meeting will be held in person at RIT as well as virtually via Zoom. Speaker: Michael Richmond, Ph.D., professor of physics and astronomy at RIT, and director of the RIT observatory. Topic: his graduate students will be discussing their research projects. Contact: Mark Minarich at mminaric@rochester.rr.com.

2 Sat: Astronomy Member Observing
Member Observing: Starting from dusk till last person leaves. Messier Marathon makeup date. Farash Center for Observational Astronomy, 8355 County Road 14 Ionia, NY 14475. For weather related cancellations or changes contact Mark Minarich at mminaric@rochester.rr.com.

3 Sun: Astronomy Open House
Open House: 12:00 p.m. - 3:00 p.m. Observatory tours and work parties. Farash Center for Observational Astronomy, 8355 County Road. For cancellations contact Roger McDonough, site manager, at rdmcdogz@aol.com.

5 Tue: Fossil Section Meeting
7:00 p.m. Meeting will be held in the community meeting room at the NEQALS building, 1030 Jackson Rd., Webster 14580. It will also be broadcast on Zoom and is open to all RAS members and guests. Natural Trap Cave is an 80-foot-deep pit in the Bighorn Mountains, in northern Wyoming, which provides important paleontological information on the North American Late Pleistocene dating from 20,000 years ago, due to a rich layer of fossils from animals that became trapped in the cave. Learn more with our distinguished guest Dr. Pennilyn Higgins, speaking on *Paleontology at the End of the Rope*. For meeting details and login info see the FossiLetter or Contact Michael Grenier at paleo@frontier.com.

6 Wed: Astronomy Board Meeting
7:00 p.m. Zoom meeting. ASRAS members welcome. Contact: Mark Minarich at mminaric@rochester.rr.com.

8 Fri-10 Sun: Rochester Mineralogical Symposium
The virtual program will feature "What's New in Minerals," special lectures, and short technical talks. Links to information are posted on the Mineral Section main page of the new RAS web site: https://rasny.org/mineral-section. To attend any portion of the program you must register in advance: https://bit.ly/eRMS2022.

14 Thu: RAS Annual Meeting and Spring Lecture
Virtual meeting using Zoom.
7:15 p.m. RAS business meeting. 7:30 p.m. Spring Lecture by Dr. John O'Shea on *Central Oregon obsidian from a submerged early Holocene archaeological site beneath Lake Huron.* Further information on page 1. Contact Michael Grenier at mgrenier@frontiernet.net.

14 Thu: Anthropology Section Meeting
7:30 p.m. Memorial Art gallery. Dr. Marie Nicole Pareja Cummings of University of Pennsylvania will be giving her talk "Bronze Age Monkeys and the Case for Interdisciplinary Collaboration" for the Rochester AIA.

20 Wed: Life Sciences - Herbarium Workshop
1:00 p.m. – 4 p.m. The Life Sciences section will hold a workshop at the RAS Herbarium, located in the basement of the Rochester Museum and Science Center (RMSC).
At RMSC go to the front desk to meet other participants. You must be fully vaccinated, and masks are required for all visitors at RMSC. At RMSC go to the front desk to meet other participants. If you plan to attend, please send RSVP or any inquiries to Elizabeth Pixley, herbarium curator, at eypixley@gmail.com, or call (585) 334-0977.

20 Wed: RAS Board Meeting
7:00 p.m. Virtual meeting using Zoom. For details, contact Michael Grenier at mgrenier@frontiernet.net.

23 Sat: Fossil Section Field Trip
10:00 a.m. – 1:00 p.m. The Gulf Railroad Cut just west of Lockport, NY. Collecting will be in the Silurian Rochester Shale. For further information contact Dan Krisher at DLKFossil@gmail.com.

30 Sat: Astronomy Member Observing
New moon member Observing: Starting from dusk till last person leaves. Messier Marathon alternate date if April 2 is clouded over. Farash Center for Observational Astronomy, 8355 County Road 14 Ionia, NY 14475. For weather related cancellations or changes contact Mark Minarich at mminaric@rochester.rr.com.

Other Events

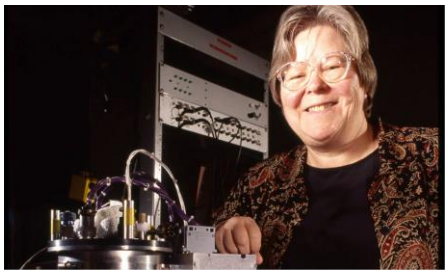
2 Sat: 2022 Undergraduate Astronomy Research Symposium
10:45 a.m. Virtual Symposium using Zoom sponsored by the University of Rochester. Topics will range across the current state of research in the field of Astronomy. Presenters are from a variety of institutions including UR, RIT, Cornell, UMD, and UCSC. The Zoom link is https://rochester.zoom.us/j/99938655213 . For additional information or last-minute changes contact Joseph Glichowski at (716) 901-5879 or jglichow@u.rochester.edu

RAS Membership Renewal
https://rasny.org/how-to-join

In Memoriam

Judy Pipher, Ph.D.

June 18, 1940 – February 21, 2022



Judith Pipher, Ph.D., professor emerita of physics and astronomy, taught at the University of Rochester from 1971 to 2002, and is known for championing women in science. She died on February 21 at the age of 81. She had given several talks to the Astronomy Section of RAS, and in fact Judy was originally scheduled to be the featured speaker for the RAS Astronomy section members meeting on March 4th but had to bow out due to her struggle with pancreatic cancer.

She was inducted into the National Women's Hall of Fame in 2007 for the exceptional advances she made in the study of astronomical objects by observing the infrared light they emit. The town of Seneca Falls, New York—the Birthplace of Women's Rights—proclaimed June 18th, 2020, Judy's 80th birthday, *Dr. Judith L. Pipher Day*. The day was marked by a parade in Judy's honor. The link https://www.youtube.com/watch?v=bt4RV-FTEec shows the town supervisor's proclamation, a photo homage of Judy's life, as well as highlights of the parade in her honor.

Widely considered 'The mother of infrared astronomy,' she actively led her research group at U of R until her death. Dan Watson, a professor of physics and astronomy at the University of Rochester, who worked closely with Dr. Pipher on many projects says, "*Judy is considered the 'mother of infrared astronomy' in many senses of motherhood. She created the technology that enables the observations we can do today. She used the technology herself to create important contributions to several frontier areas of astrophysics. And through directly nurturing her close-by junior colleagues and serving as a beacon more widely, she has contributed mightily to the creation of two generations of astrophysicists.*"

Judy was native of Toronto, Ontario, Canada, and earned her PhD from Cornell University in 1971, where her dissertation was one of the first in the newly emerging fields of submillimeter and infrared astronomy. Later that year, she began her career at the University of Rochester. At the time, she was the only female faculty member in the physics department.

At the University of Rochester, from 1979 to 1994 she directed the C.E.K. Mees Observatory—an astronomical observatory in Bristol, New York that is owned and operated by the university, and she played a large role in revising undergraduate astronomy courses. During her time at Rochester, in addition to teaching, Dr. Pipher conducted research on galactic and extragalactic star formation and developed technologies for many groundbreaking projects in infrared astronomy, forming partnerships between academic and industrial research groups. In 1983, she was among the first astronomers from the United States to observe the skies with an infrared camera, which she used to capture images of starburst galaxies.

Along with her Rochester colleagues Bill Forrest and Dan Watson, she designed and tested infrared detectors for NASA projects including the Spitzer Space Telescope, which launched in 2003 and was retired in 2020. Spitzer was used to map obscured birthplaces of stars and planets in our galaxy and other galaxies, and the detectors developed by Dr. Pipher and her colleagues formed Spitzer's electronic "eyes." Dr Pipher also worked on the Near-Earth Object (NEO) Surveyor (formerly known as NEOCam), a NASA project to discover, track, and characterize potentially hazardous asteroids and comets that come within Earth's vicinity.

A giant in Infrared Astronomy, Judy will be greatly missed by all of us!

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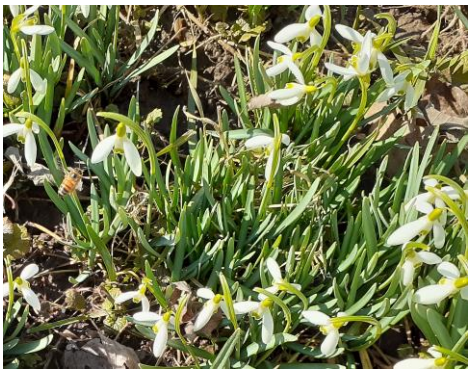
Early Spring Awakenings in the Rochester, NY Area

Eastern Skunk Cabbage Flower—*Symplocarpus foetidus*. Photo taken on March 17th, 2022, at Fishers park a short distance south of Irondequoit creek. Courtesy Douglas Kostyk.



Common snowdrops—*Galanthus nivalis*. Photo taken March 17th, 2022, in Hilton NY near corner of Collamer Rd and West Ave. Note appearance of honeybee, *Apis mellifera*, at center left of photo. Courtesy David Bishop.

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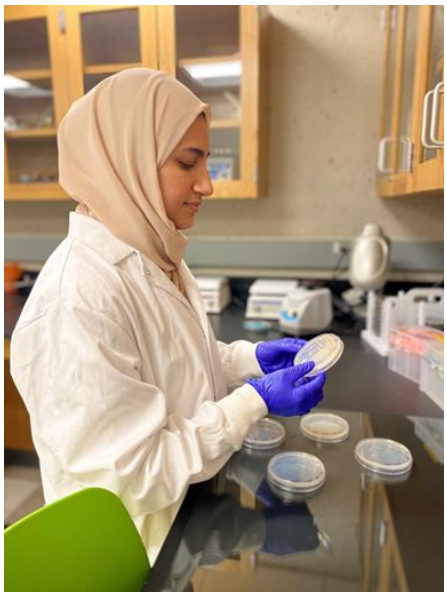
RAS Membership Renewal

https://rasny.org/how-to-join

2021-2022 Undergraduate Student Research Grant Award Winner

Remote Sensing Freshwater Bacteria in Great Lakes

Raunak Al-Rubayie and Fernando Ontiveros, Ph.D., Department of Biology, St, John Fisher College.



Raunak Al-Rubayie in the lab.

Abstract and Introduction

Remote sensing of bacterial populations using satellite imagery in small and large bodies of water can significantly enhance our ability to understand freshwater ecosystems and monitor water quality. Although the identification of individual species is still unfeasible, the detection of certain bacterial groups and the likelihood of occurrence would be very valuable. Spectral analysis of satellite imagery is currently used to determine water parameters like temperature, turbidity, phytoplankton, and dissolved organic matter. In order to establish a correlation between some of these parameters and the presence of microorganisms, we collect water samples from several locations in the Lake Ontario Rochester Embayment and Irondequoit Bay that are imaged by the Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS) sensors. Using bacterial 16S rRNA, we map the diversity and distribution of microorganisms isolated from the samples and then link this information to the bio-optical properties of the water. A comprehensive understanding of the factors affecting the conditions favoring the establishment of the microbial flora will require a library of seasonal ground truth sampling to assess potential geographic distributions of the bacterial populations. The ultimate goal of the project is to find correlations between the parameters of the water that can be measured by the satellite and the bacterial species found in the water.

Background and rationale

Water samples were collected from several locations in the Lake Ontario Rochester Embayment and Irondequoit Bay that were imaged by the new Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS) sensors. The samples were then filtered, isolated, and stored in the freezer. The bacteria are then taken from the freezer, plated, and sequenced. To be able to organize and analyze the data that was collected and sequenced, the software ArcGIS helps to create an interactive map where it plots all of the data, sorts them into different categories, and relays the information for each kind of bacteria and where they were collected. Satellite technology can provide monitoring of the water quality of large bodies of water on a daily basis [1]. Remote Sensing (RS) can be used to infer the presence of most species of bacteria, and provides a cheaper means to collect samples than shipboard data acquisition. Research also shows that in the future, RS may be a method to identify bacteria and predict possible outbreaks of bacteria [2]. This could be helpful for societies who rely heavily on unprocessed freshwater as a drinking water source.

Procedures and methods

There are two phases for the sequencing of the bacteria collected from the lakes. Phase 1 includes water filtration of samples collected from the lakes, bacterial isolation, and freezing of filtered samples. Then in phase 2 the samples are plated into R2A plates, Polymerase Chain Reaction (PCR) is conducted, DNA purification, gel electro-phoresis, and then samples are sent to University of Rochester for sequencing. Surface water samples were collected in the following Rochester-Lake Ontario Embayment Areas: Braddock Bay, Lake Ontario off Braddock Bay, Lake Ontario Offshore, Lake Ontario Nearshore, Lake Ontario Genesee Plume, Lake Ontario River Pier, Lake Ontario North Bay, Long Pond North and South, Cranberry Pond, and Irondequoit Bay. Water samples (~30 mL) were collected via kayak, canoe, or drone. All were stored in sterile 50 mL falcon tubes. The temperature of the water was recorded. Over 1100 samples were collected every summer from 2013 to 2019. All surface water samples were collected on the days that satellite LANDSAT 8 carrying the OLI sensors passed by the sample area in order to allow a comparison of satellite technology with data from the ground. The falcon tubes were put in ice and kept refrigerated until the filtering process was performed.

Expected Outcomes

The samples that were collected will be sequenced and mapped to be able to predict what bacteria will be present at certain times when the Landsat 8 is flying over the area. The imaging from the satellite will be used to predict the bacteria that are currently in that area. The data that are collected and mapped helps when looking at the patterns, aids in visualizing where the samples are taken, and helps display the information. Landsat 8 can then be used to determine the types of

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Remote Sensing
(Continued from p.5)

bacteria and genera that are present in the lakes by using temperature of the water, humidity, time of year, etc. Preliminary results show that the most prevalent bacterial genus is *Acinetobacter*, which appeared 139 times. Other frequent bacterial genera included *Pseudomonas*, *Bacillus*, *Exiguobacterium*, *Chryseobacterium*, *Pantoea*, and *Flavobacterium*. A total of 39 genera had been identified in this collection. Some of these species are harmful and some play a role in maintaining the health of these lakes. Since the Great Lakes have been polluted over the years and many people depend on the lakes, it is vital to understand the patterns of bacteria and the health of the lakes.

References

1. Sayers MJ, Bosse KR, Shuchman RA, Ruberg SA, Fahnenstiel GL, Leshkevich GA, Stuart DG, Johengen TH, Burtner AM, Palladino D. Spatial and temporal variability of inherent and apparent optical properties in western Lake Erie: Implications for water quality remote sensing. 2019 Mar 30 [accessed 2021 Dec 20]. https://www.sciencedirect.com/science/article/pii/S0380133019300 67X?via%3Dihub

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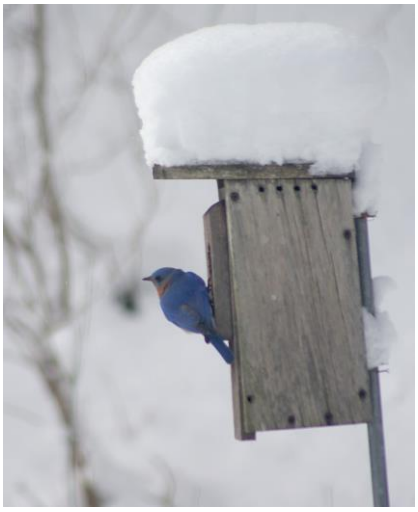
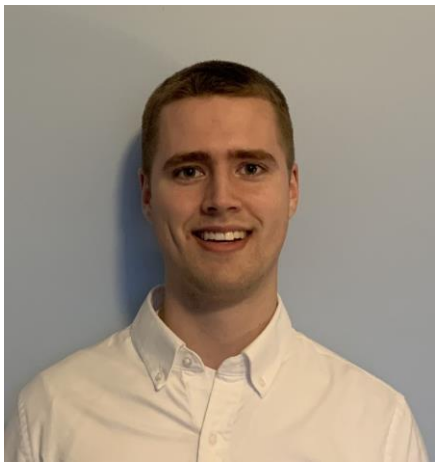


Eastern Bluebird, *Sialia sialis*, returning to Hopper Hill in Ionia, NY on March 13, 2022. Courtesy Douglas Kostyk.

2021-2022 Undergraduate Student Research Grant Award Winner

Co-Culturing of 3T3-L1 adipocytes and J774A.1 macrophages

Brock Johnston and Laurie B. Cook Ph.D., Associate Professor of Biology & Director of Pre-professional Health Program, SUNY Brockport Department of Biology.



Brock Johnston

Introduction

In general, tissue culture is a powerful model system for studying cell physiology. Most culture models are conducted as purified specimens of a single cell type. Co-culturing two or more cell types together provides an opportunity to study cells in a setting that better mimics inter-cellular communication. Adipocytes and macrophages are known to communicate with one another, causing inflammation. My experimental objective is to establish a co-culture model in our lab that includes 3T3-L1 adipocytes with J774A.1 macrophages.

Hypothesis

The aims of the research are three-fold: to be able to successfully culture both cell lines, to be able to model inter-cellular communication using a trans-well culture system, and to determine if Melanin-Concentrating Hormone (MCH) increases J774A.1 migration into the 3T3-L1 adipocyte insert dish. If this hypothesis holds, it will enable me to test in a later semester another hypothesis, that an appetite-stimulating hormone, MCH, causes an increase in pro-inflammatory cytokines like TNFα and IL1β to be released from macrophages and the pro-inflammatory adipokine Monocyte Chemoattractant Protein-1 (MCP-1) to be released from adipocytes.

Background

Overeating is a worldwide problem, resulting in obesity, defined as a Body Mass Index over 30. According to the Centers for Disease Control and Prevention (CDC), 42.4% of Americans are obese [1]. The National Diabetes Statistics Report states that diabetes affects 34.2 million Americans [2]. There are two types of diabetes: Type I, in which the individual cannot produce their own insulin, and Type II, which is usually associated with obesity. Type II diabetes is largely from tissue resistance to secreted insulin, caused by sedentary lifestyle as well as poor diet. Type II diabetes may be alleviated or even reversed with weight loss. Hunger and satiety signaling research is therefore relevant.

The Melanin-concentrating hormone (MCH) is a protein that drives behaviors such as eating, and drinking. It is produced in neurons of the hypothalamic region [3]. MCH-1 receptors have been found in adipose tissue [5], indicating that MCH can influence adipocytes in some way. MCH has been shown in rat adipocytes to increase leptin secretion, which homeostatically stops MCH secretion [5]. Since leptin is only released when there is a high intake of food, leptin's action is to increase satiety [6]. When MCH is secreted, an individual feels hunger, causing the incorporation of dietary glucose into the bloodstream, which in turn causes an influx into adipose tissue lipid droplets. To store this energy more adipose tissue may be produced [7]. This shows MCH has a large role in fat disposition, since the

(Continued on p.7)

Co-Culturing Macrophages
(Continued from p.6)

more MCH is released by hypothalamic neurons, the more food will be consumed, and the more lipid droplets will accumulate. Since it has been established that MCH augments fat deposition, a mouse adipocyte cell line called 3T3-L1 will be used to explore if adipose tissue inflammation results from excessive MCH expression.

Inflammation includes a cell's response to a multitude of stimuli and is part of the healing process. However, when these adipocyte signals called adipokines do not stop, this creates chronic inflammation. As a consequence, bone marrow stem cells are recruited to produce monocytes, which once they reach the adipose tissue (AT) are known as macrophages [8], which impair adipocyte insulin signaling.

In this experiment J774A.1 macrophages from *Mus musculus* mice (common house mouse) will be used to explore this interaction. AT is mainly composed of adipocytes but also has blood vessels, nerve terminals, fibroblasts, and immune cells [9]. In chronically inflamed AT, macrophages are metabolically activated (hypothesized Me phenotype - metabolic activation rather than classical), As a result, they secrete pro-inflammatory cytokines creating more tissue inflammation and insulin resistance (IR) than the M1 macrophages associated with acute adipose inflammation [11]. Some of the pro-inflammatory cytokines include Tumor Necrosis Factor Alpha (TNF-α) and Interleukin-1β (IL-1β) (12). This insulin resistance causes failure in glucose uptake, and glycogen synthesis [10]. IR forces β-cells in the liver to secrete more insulin, making these cells exhausted and no longer being able to provide enough insulin, causing Type II diabetes (T2D) and hypoglycemia [11].

Studies have found that the number of macrophages and their pro-inflammatory cytokines in AT is positively correlated with adipocyte size in mice and negatively associated with weight loss in humans [9]. Therefore, there must be clear crosstalk between macrophages and adipocytes in order to remodel the AT in an obese individual. This background leads into the second hypothesis that MCH causes an increase in pro-inflammatory cytokines like TNFα and IL1β to be released from macrophages and the pro-inflammatory adipokine Monocyte Chemoattractant Protein-1 (MCP-1) to be released from adipocytes.

Procedures

Our lab has been prolific in 3T3-L1 pre-adipocyte culturing and differentiation [13]. The 3T3-L1 pre-adipocyte culturing and differentiation protocol will follow previous publications of our lab [13], [14]. J774A.1 subcultures follow the ATCC product sheet [15]. The co-culture trans-well system between 3T3-L1 adipocytes and J774A.1 macrophages will follow Monk et al. textbook chapter [16]. The determination of the presence of MCH receptors on J774A.1 macrophages will be determined by Western Blot and microscopy. Next tracking macrophage migration into the adipocyte compartment of co-culture inserts will be done by using macrophage markers CD86, CD68, CD163 whose antibody will be used for visual staining. This experiment will answer the hypothesis that MCH increases the rate of migration of J774A.1 macrophages into 3T3-L1 adipocyte insert dishes. If this hypothesis holds true, this Co-culture system will later allow for the second hypothesis mentioned above in the Hypothesis section to be answered using Western Blot and microscopy. This co-culture was of interest because of the gene expression changes found in adipocytes when MCH was introduced to them, as seen in our lab's publication (13), prompting the question of what effect would MCH have on a macrophage adipocyte co-culture.

Expected Outcomes

Expected outcomes include successfully subculturing both 3T3-L1 pre-adipocytes and J774A.1 macrophages, successfully differentiating 3T3-L1 adipocytes, and generating a strong 3T3-L1 adipocyte J774A.1 macrophage co-culture. We shall determine if J774A.1 macrophages have MCH receptors by western blot and fluorescence microscopy using antibody towards MCH receptor 1. Next, we will track macrophage migration into the adipocyte compartment to answer the first hypothesis.

This past Fall semester I worked on subculturing 3T3-L1 pre-adipocytes and successfully differentiated them, followed by an oil red stain to confirm their differentiation. The estimated date of completion is the end of the spring 2022 semester.

References

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Co-Culturing Macrophages
(Continued from p.7)

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