



**Transformative Research in Metabolism (TRiM)**  
**Internal Steering Committee Meeting (ISC)**  
**Friday, September 24, 2021**  
**12:00 to 1:00 p.m. by Zoom**  
<https://alaska.zoom.us/j/899633093>

Meeting Objectives: Discuss the final draft retreat agenda and supplemental documents items. As time allows, discuss the EAC Recommendations and TRiM's Committee Working Document as a reference for developing the EAC Action Plan and share current program updates. Please see the meeting packet for research and core updates reported for postponed August ISC meeting (pp 6-9).

- 12:00 p.m. Welcome All: Chair Khrys Duddleston
- 12:05 p.m. Review and act on ISC draft meeting agenda, 9.24.2021. Any new items to add?
- 12:05 p.m. Review and act on ISC draft meeting minutes, 7.2.2021
- 12:10 p.m. Old Business
- Update on the Joint INBRE-TRiM Retreat. INBRE retreat postponed to Spring 2022.
  - Results from poll regarding TRiM's Retreat – Preference for online or In-person meeting and when to schedule the retreat
- 12:15 p.m. New Business
- Discuss Draft Retreat Agenda (To be distributed prior to ISC meeting with supplemental documents)  
We will take a few minutes to first walk through the agenda by describing the item proposed, why it was proposed, and who the target audience is for that session.
- 12:45 p.m. Other ISC discussion items (as time allows)
- EAC recommendations and TRiM committee discussion alignment (document attached separately)
  - Research Project and Core Snapshot Updates – All are invited to share. Please see written reports in the meeting packet for August updates.
- 12:55 p.m. Other Announcements
- Dr. Robert Coker's new DoD Grant: Congratulations Trey!  
*This award from the United States Air Force Research Laboratory will support a three-year multi-site consortium between UAF (led by Robert "Trey" Coker, PhD), the University of Montana (led by Brent Ruby, PhD) and the University of Nebraska (led by Dustin Slivka, PhD). There is strong potential for a 5-10 year extension and additional funding from the United States Army.*
- The overall objective is to evaluate changes in substrate metabolism in response to extreme environmental (cold, heat and altitude) and physical stress in humans. Our ability to conduct these types of studies in unscripted field related scenarios is a fundamental strength. The work is*

*particularly relevant to special operators and pilots and will serve to optimize training activities (i.e., SERE and/or Q course) and operational performance, especially in the Arctic.*

- Other announcements?

1:00 p.m.      Adjourn

**Next ISC meeting, Friday, October 29, 12:00 p.m. to 1:00 p.m. Note: If you would like to present an update at the October ISC meeting, please let Khrys and/or Denise know. Thank you!**



**Center for Transformative Research in Metabolism (TRiM)  
Internal Steering Committee Meeting (ISC), Draft Minutes  
Friday, July 2, 2021, 12:00 to 1:00 p.m., Virtual Meeting by Zoom**

**Call to order:** ISC Chair Khrys Duddleston welcomed all and called the meeting to order at 12:01 p.m.

**I. Attendance:** UAA representatives present included Brandon Briggs (AIMS Core Leader) and Khrys Duddleston, ISC Chair. UAF representatives were Dr. Kelly Drew (TRiM Director and PI), Dr. Robert (“Trey”) Coker (Project 3 PI), Dr. Vadim Fedorov (Project 1 PI), Dr. Carl Murphy (Leader, HaMR Core and MIF Manager), Dr. Oivind Toien (HaMR Core), Scott Jerome (HaMR Core), Jen Danielson (TRiM external evaluator, Goldstream Group), Hoshi Sugiura (Admin Core), Sheri Coker (Project 3), Daniel Fullmer, Julie Benson (AK INBRE), Dawniel Dupee (Admin Core) and Denise Daniello (Admin Core).

**II. Agenda, 7.2.2021:** A motion to approve the agenda was made by Carl and seconded by Trey. ISC members were polled and unanimously accepted the agenda with no changes.

**III. Draft Minutes, 4.30.2021:** A motion to approve the minutes was made by Carl and seconded by Brandon. ISC members were polled and approved the minutes with no changes.

**IV. Old Business: Discuss EAC Report and Recommendations from June 1-2, 2021 EAC meeting.**

Khrys facilitated the discussion and asked TRiM personnel to provide their general feedback about the EAC meeting. Kelly commented on the technology challenges of conducting a hybrid meeting and noted that next year, we will plan to have one-day at UAF with the second day at UAA campus for the 2022 EAC meeting. Trey appreciated the opportunity to meet the EAC members in person and to talk with them informally outside of the meeting time.

Khrys noted her disappointment with the EAC members’ evaluation of the significant progress made this past year, despite the impact of the pandemic on research activities. Kelly added that the report noted that progress was “more than adequate” however, noting that UA, in general, is behind other states with respect to our capacity in addition to challenges posed by the pandemic. Trey added the impact of “financial exigency,” along with the emotional setbacks of being disconnected from family living outside the state during the pandemic.

The EAC meeting included presentation time for Research Project PIs, Core Leaders, and Pilot Project investigators. Trey noted that all of the presentations were exceptional, including Dr. Loren Buck’s presentation of Project 2 and the pilot projects. Dr. Buck, scientific advisor and long-time collaborator of Khrys, delivered the project’s presentation at the EAC meeting as Khrys was taking family emergency leave. Khrys suggested that TRiM follow-up with the EAC in response to their recommendations and more specifically, to address the comments directed at her project to which she would like to respond. Kelly added that we will schedule a meeting with the EAC (during the winter months) and provide follow-up response to their report in addition to sharing new progress made by the pilots recently awarded and TRiM’s research and program activities.

Committee members were then polled for their responses to the following questions concerning the EAC meeting. Polling responses and corresponding discussion are noted below:

Q1. In your opinion of the June 1-2 EAC meeting, what went well?

PI and Core Leader Presentations	6
Pilot Project Presentations	5
Opportunity to meet with EAC members	4
Meeting organization and meeting binder	2
Input from EAC members	2
AGS Breeding Colony Tour	1
Focus Group Discussion	1

Q2. In your opinion of the EAC meeting (June 1-2, 2021), what do you think did not go as well as expected? (Only options that received a vote are shown below.)

Focus Group Discussion	2
Input from EAC members	1
Technology issues associated with the hybrid meeting.	2
Opportunity to meet with EAC members	1

The members discussed strategies to respond to the EAC report that included organizing the recommendations around themes that have also been discussed during the SAC, TAC, and ISC meetings, based on meeting notes from those committees. Denise offered to help by creating a table that lists the EAC recommendations that correspond to items that were previously discussed at TRiM's committees, when appropriate, and the action steps proposed by those committees related to the items. She will develop the table for ISC members to review at the August 27<sup>th</sup> (not September 24<sup>th</sup>) meeting as a starting point for discussion. Khrys asked Denise to also share sets of the selected committee notes for ISC members to review.

Q3. What could be done differently next year to improve the EAC meeting? (Check all that apply.)

Include EAC visits on both the UAA and UAF campuses	6
Hold the meeting on a different date (put suggestions in the chat)	1

The EAC report included a recommendation for TRiM to consider sponsorship of a conference in collaboration with the Gordon Research Conference, Keystone Symposia, or other professional societies with interest in environmental factors affecting human biology. Dr. Margaret Rice, EAC member, followed-up with information regarding possible sponsorships for a hibernation/metabolism/therapeutics conference using the Federation of American Sciences in Experimental Biology (FASEB) and Catalyst Conferences for the ISC to consider.

Khrys suggested that TRiM could also propose a session as part of the annual Experimental Biology conference or the Society for Integrative and Comparative Biology (SICB), which would be easier to put together than submitting a NIH funding application for the other options proposed by the EAC. Kelly suggested that we could recruit 4-5 presenters to speak for a 90 to 120-minute symposium. Trey noted that it may be beneficial to hold the symposium (organized as a small mini-conference) to promote awareness of our research facilities for NIH program officers and other investigators. Khrys added that the symposium could include presentations and touring of research facilities scheduled over two days with one day at UAF and the second day at UAA. Khrys suggested that we could talk more about the science conference at the retreat.

Members were polled for their opinions regarding holding a hibernation conference. Four members responded to the poll and all agreed that TRiM should hold a conference. Members were then polled as to the timing for the

conference. We had 4 members responding with 2 indicating their preference for Spring 2022, one for Winter 2021, and one for Spring 2023.

Finally, we polled members to ask if they would be available to begin the TRiM retreat on Friday, October 1. There were 5 members responding with 4 indicating their availability to begin on October 1.

Khrys suggested that we begin TRiM's retreat on Friday afternoon, October 1, with continuation on Saturday (about ½ day) or Sunday, October 3<sup>rd</sup> as time allows. Khrys noted that there is much value in doing a combined retreat with INBRE. She plans to have her INBRE students attend the retreat.

**V. EAC Focus Group Discussion** – Due to technology challenges, the focus group outcome discussion scheduled on June 25 with the SWOT facilitator, Dr. Cecile Lardon, Department of Psychology, was postponed. The SWOT discussion will be taken up at a future time.

#### **VI. Update on Planning for TRiM's Annual Retreat**

Denise shared a draft budget comparing costs for conducting a collaborative retreat with INBRE versus TRiM doing a one-day retreat at Chena Hot Springs Resort. Using cost estimates provided by INBRE, TRiM's costs for the collaborative retreat would be higher (\$11,911) versus the one-day retreat at Chena Hot Springs Resort (\$7,680 for an Oct. meeting) to accommodate 17 TRiM personnel. These estimated total costs include the ITHS Introduction to Team Science Training and travel (UAA TRiM personnel airfare to Fairbanks and one-night lodging). Comparing lodging and catering only still showed higher costs for participating in the collaborative retreat (\$7,300) versus the Chena Hot Springs Resort location (\$4,033). These cost estimates are based on INBRE's costs and did not include a possible subsidy from INBRE.

Julie Benson, INBRE Program Administrator, was present at the meeting to answer questions. Julie strongly encouraged all who were planning to attend the INBRE retreat to use the charter buses as this option saves money. Kelly noted that those who wish to drive their own vehicles could pay for their own travel expenses out of pocket. Julie suggested that TRiM could help with judging and/or participating in poster sessions as well as by engaging our Core Leaders (Brandon and Carl) to talk about their resources during "INBRE Opportunities" or during another time to be scheduled. Julie also suggested that TRiM personnel be present during the Introductions on Saturday, 8:30 a.m. to 9:00 a.m.

Kelly asked Denise and Khrys to work together to draft a retreat agenda. The meeting went long and we decided to adjourn. Research project and Core updates will be heard at the next ISC meeting, August 27<sup>th</sup>, (now September 24<sup>th</sup>) noon to 1:00 p.m.

**VII. Adjourn** – The meeting adjourned at 1:15 p.m.



ISC Meeting, August 27, 2021 – Core and Research Project Updates (These updates were reported for the postponed August 27, 2021 ISC meeting. Please share any additional updates at the end of our meeting on September 24.)

Research Projects

***Post transcriptional mechanisms of muscle atrophy prevention in hibernating mammals (Project 1).***

**Submitted by PI Vadim Fedorov, PhD and Dr. Anya Goropashnaya**

- First draft of a manuscript on **black bear proteomics** by Michelle Johannsen. After comments of Vadim Fedorov, more analysis is added and in progress.
- Results of **Rib-seq and RNA-seq from AGS skeletal leg muscles** were obtained from OHMX, Belgium. Five samples of summer active animals, five from each torpor and arousal during hibernation were screened for differentially expressed transcripts and ribosome protected mRNA fragments (RPFs, 30 base pairs). Quality control of raw and aligned reads as well as specific ribosome profiling quality control showed very good scores and expected outcome.
- After obtaining read counts of transcriptomics (RNA-seq) and translomics (RIBO-seq) the samples formed groups according to the physiological state of AGS with 2 outliers in each data set. Discarding the outliers highly improved the group sample clustering, so more of the variation is captured in the between-group comparisons.
- Differential analysis of transcriptomics (total 16,638 genes) and translomics (17,255 genes) data showed the following numbers of up- and down-regulated genes:

Torpor vs. summer active: 595 (3.6%) and 1107 (6.7%); 571 (3.3%) and 1202 (7%)

Torpor vs. arousal: 163 (0.98%) and 409 (2.5%); 276 (1.6%) and 905 (5.2%)

Arousal vs. summer active: 258 (1.6%) and 317 (1.9%); 107 (0.62%) and 94 (0.54%)

- Translation efficiency is ratio of a RIBO-seq read counts over the corresponding RNA-seq read counts of a gene. This measure describes how efficient the mRNA of a certain gene is translated into a protein. The following results were obtained from the pair-wise comparisons between the groups using 18,680 genes with non-zero total read count:

Torpor vs. summer active: 531 (2.8%) and 1280 (6.9%)

Torpor vs. arousal: 196 (1%) and 1212 (6.5%)

Arousal vs. summer active: 199 (1.1%) and 69 (0.37%)

- A progress was made on establishing IHC technique in house. Five muscles of a summer active AGS were cut and stained. Upgrades were made on the computer system attached to microscopes.

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**Microbial provision of essential amino acids: protein conservation in hibernation, Project 2. Submitted by PI Khrys Duddleston, PhD.**

1. We received metagenomics and metatranscriptomics data from GeneWiz. Kirsten continues to analyze those plus metabolomics data
2. Kirsten and I are submitting an abstract for SICB 2022
3. More samples are about to be sent (next week) to Denver (for metabolomics), along with splits given to Pat Tomco. Pat will travel to Denver to learn the metabolomics methods and then develop similar methods here at UAA, using our splits.
4. Kirsten and I's first paper together is now published (attached). A second paper (that also includes Pat Tomco) was just submitted.
5. We will be completing a control experiment in which we knockdown squirrel microbiomes with antibiotics, inject labeled urea, and then collect tissues for 15N and breath for 13C. This experiment will be completed in 3 weeks, at which time the last of the breath and tissue samples for our project will be sent to NAU for analysis
6. Graduate student Heidi McKee is now in Anchorage and she will begin work on Aim 3 this semester

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**Nutritional strategies for metabolic health in aging, Project 3. Submitted by PI Robert Coker, PhD.**

Project 3 Clinical Trial Recruitment

- Telephone Screenings – 58 participants
- Enrolled and Screen Completion – 12 participants
- Enrolled and Active – 4 participants

Original Research and Review Articles

- Coker MS, Barati Z, Murphy CJ, Bateman T, Newcomer BR, Wolfe RR, Coker RH, Essential amino acids enriched meal replacement improves body composition and physical function in older, obese adults: a randomized controlled trial. *J Gerontol Med Sci*, Submitted Jun 14, 2021.
- Rosales AM, Dodds PS, Hailes WS, Sol J, Coker RH, Quindry J, Ruby BC, Deterioration of lipid metabolism despite fitness improvements in wildland firefighters, *Med Sci Sports Exerc*, Submitted July 1, 2021.
- Ruby BC, Coker RH, Sol J, Quindry J. Physiology of the Wildland Firefighter, *Environmental and Occupational Perspectives*. *J Appl Physiol*, Submitted July 19, 2021.
- Kienast C, Biere K, Coker RH, Genov N, Joerres M, Maggioni MA, Mascarell-Maricic, Schalt A, Wypukol M, Gunga H-C, Steinach M. Key Predictors to Successfully Cope with the Yukon Arctic Ultra: The Longest and Coldest Ultramarathon. *Front Physiol*. Submitted July 19, 2021.
- Steinach M, Biere K, Coker RH, Gaul AL, Hoerl M, Jorres M, Kienast C, Mascarell-Maricic L, Schalt A, Gunga H-C, Chouker A, Rehm M. Shedding of Glycocalyx during an Ultramarathon in a Subarctic Climate, *Med Sci Sports Exer*. Submitted July 22, 2021.

Presentations

- Coker MS, The Health Benefits of the Hunter/Gatherer Lifestyle, PhD Dissertation Defense, April 28, 2021.
- Coker RH, Ruby BC, Quindry J. Invited Symposium: Friends and Enemies of Physiological Resilience. American College of Sports Medicine Annual Meeting. June 5, 2021.
- Coker RH, Hunt Backcountry Podcast: A Scientific Study of Backcountry Hunting, May 20, 2021. <https://soundcloud.com/huntbackcountry/284-a-scientific-study-of-backcountry-hunting>
- Coker MS, Nutrient Strategies for Metabolic Health in Aging, Foundation Health Partners and Interior Public Health Partners, July 20, 2021

- Coker RH, Early Detection of Genetic Risk in Rural Settings. Alaska Native Tribal Health Consortium Brown Bag Series, July 21, 2021.
- Daniello D, Ground K, Drew K, Coker RH, Fedorov V, Duddlestone K. Translating hibernation research to promote healthy aging across the lifespan. 16<sup>th</sup> Annual International Hibernation Symposium, Groningen, Netherlands, August 3, 2021.

Grants (funded, not related to Project 3)

- Predictors of Physiological Resilience during Physical and Environmental Stress, Site PI – Coker RH, United States Air Force Research Laboratory, Department of Defense – Congressionally Directed Medical Research Programs, 10/01/2021-09/30/2024, \$550,000.

Grants (in review)

- NIH/NCATS 5UL1TR002319-03 Institute of Translational Health Sciences (PI: Disis N; Regional Director and Site Champion: Coker); Priority Score of 20, funding anticipated.
- NIDDK Northwest Post-Acute Sequelae of SARS-CoV-2 infection (PASC) Consortium for Diabetes, Kidney and Metabolic Diseases (PAS-CKD) (PI: Tuttle K; Site PI: Coker RH).

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**AIMS Core Facility** - Submitted by Eric Henderson, Lab Manager:

- Exploring a new 16S method that will allow for quicker library preparation and working on quantifying our Covid-19 wastewater results.

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**Admin Core** - Submitted by Denise Daniello, Program Coordinator

International Hibernation Symposium, August 2-6, 2021 – The Admin Core submitted two approved abstracts for an in-person presentation and poster session. Director Drew presented *An Adenosine Model of Hibernation* during the Metabolism session and TRiM’s poster was titled *Translating Hibernation Research to Promote Healthy Aging Across the Life Span*. Other Center-affiliated presenters included Drs. Oivind Toien, *Absence of Circadian Activity Rhythms in Hibernating Black Bears Kept in Dark Dens*; Brian Barnes, *Circannual and Annual Rhythms in Captive and Free-Living Hibernating Ground Squirrels*; and Bahareh Barati, *Peripheral and Central Blood Flow Monitoring During Arousal from Torpor in Arctic Ground Squirrels*. Selected presentation recordings were shown at Journal Club (8.6.2021) and a follow-up conversation about the Symposium is scheduled for Sept. 24 during Journal Club with Kelly and Oivind.

INBRE-TRiM Joint Retreat – Planning efforts are underway for the retreat: (1) Submitted an approved proposal packet to INBRE requesting partial subsidy for TRiM’s retreat in return for our participation in INBRE’s activities that include plenary and poster sessions, Core Resource Sharing, helping with retreat logistics, and contributing to social networking; (2) prepared a draft agenda for ISC members to finalize; (3) developed baseline information to conduct a Strategic Planning Session to address the EAC recommendations from the June 2021 meeting; and (4) working with ITHS to develop the Team Science training activity. At this time due to the evolving pandemic situation, INBRE has decided to postpone their retreat to spring 2022 in hope that it will be safe to meet in person. At the August ISC meeting, we will ask the ISC to advise us as to when and where to hold TRiM’s retreat.

EAC Recommendations and TRiM Committee Discussion – As requested at the July ISC meeting, the Admin Core created a table listing each EAC recommendation and corresponding discussion themes as reported by TRiM’s Committee minutes. This document is intended to help facilitate the Center’s responses to EAC recommendations, which will be due at the next EAC meeting (to be scheduled in early winter).



Alaska Defense Forum, UAF Day – TRiM was invited by the UAF VCR to make a presentation about our program to the forum’s sponsors including representatives from the Association of Defense Communities, the Fairbanks North Star Borough, and the Alaska Municipal League (8.3.2021). Although the forum was re-organized and TRiM’s participation no longer required, we want to thank Drs. Carl Murphy and Anya Goropashnaya for their willingness and efforts to make a team presentation with Denise about the Center.

Annual Report, GY03 – TRiM’s annual report is now published and we have mailed printed copies of the report to policymakers (local, state, and Congressional) along with other key stakeholders to promote awareness about our research and translational applications to improve human health. If you would like a hard copy of this report, please let Denise know.

Fundraising – Our request to establish a UA Foundation Support Donor Fund on behalf of the Center to raise funds for an endowed Center Director, per TRiM’s grant application to NIH, was approved by the IAB Director and the UAF VCR. A “Giving Page” was added to TRiM’s website for public members to contribute. The goal is to raise funds for an endowed Center Director beginning in 2025 to accelerate discovery and reduce the burden of metabolic disease. Our fundraising efforts will also include fundraising activities/events... So, stay tuned.

NIH SuRE Funding Mechanisms – The Admin Core continues to work on strategies to address institutional eligibility criteria that will allow our biomedical investigators access to new NIH funding mechanisms. SuRE provides two awards: (1) *Support for Research Excellence, R16* (\$100,000 for 4 years to develop and sustain faculty who are engaging students in research) and (2) *SuRE First Independent Research, R16* (\$125,000 for 4 years with a focus on developing/sustaining faculty investigators who have not had prior independent research grants). SuRE’s institutional eligibility criteria include: (1) Award B.A. or B.S degrees in biomedical sciences; (2) have received no more than \$6 million/year (total costs) for NIH RPGs in the last two years; and (3) enroll at least 25% of undergraduate students supported by Pell grants in the most recent 2 years, based on the federal IPED database. UAF meets the first two criteria but we fall short on the third with our Pell grant undergraduate student enrollment being at 22% and 24% for the last 2 years, respectively. We have met with OGCA, the Provost’s Office, and Financial Aid to bring awareness about these new funding mechanisms and our barrier to access them. We are optimistic that a solution will be found.

Budgeting – TRiM received the notice of award from NIH for GY03 (7.23.2021). Working with OGCA, Dawniel has established new fund orgs for GY03 and developed TRiM’s GY03 budget, in consultation with TRiM’s Research PIs and Core Leaders. The Admin Core is also drafting TRiM’s carryforward requests which will be submitted with our Federal Financial Report (FFR) to NIH in late September.

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## **Pilot Projects**

*Molecular Mechanisms Underlying Skeletal Muscle Temporal Dynamics in a Hibernating Mammal as a Pathway to Peripheral Artery Disease Intervention, Pilot Project (Submitted by Dr. Anya Goropashnaya)*

- Software MyoVision was installed on a lab computer and Dr. Yuan Wen consulted how to work with it.
- Dr. Goropashnaya participated in the Alaska INBRE sponsored Genomics Workshop.
- Progress was made on establishing IHC technique in house. Five muscles of a summer active AGS were cut and stained. Upgrades were made on the computer system attached to microscopes.