Session: What Makes and Effective Team in Science

The MoTrPAC Example

Multidisciplinary Research in Aging/Team Science

Washington, DC

May 20-21, 2026

MoTrPAC
Discovering Exercise

oTrPAC Data Hub

MoTrPAC-data.org

MoTrPAC: Molecular Transducers of Physical Activity

- To understand the molecular mediators and transducers of the health benefits of exercise of two modes: endurance and strength
- Establishment of consortia willing to share resources
- NIH Common Fund - $170M through 2026 (+2 yrs)
  - 1541 sedentary adults RCT – no exercise vs. endurance vs. resistance training 12 w.
  - 296 highly active comparison group – endurance and resistance
  - Robust phenotyping in acute training bout before and after training
  - Blood, muscle, adipose ‘omics
- 6 mo. and 18 mo. aerobic training rats



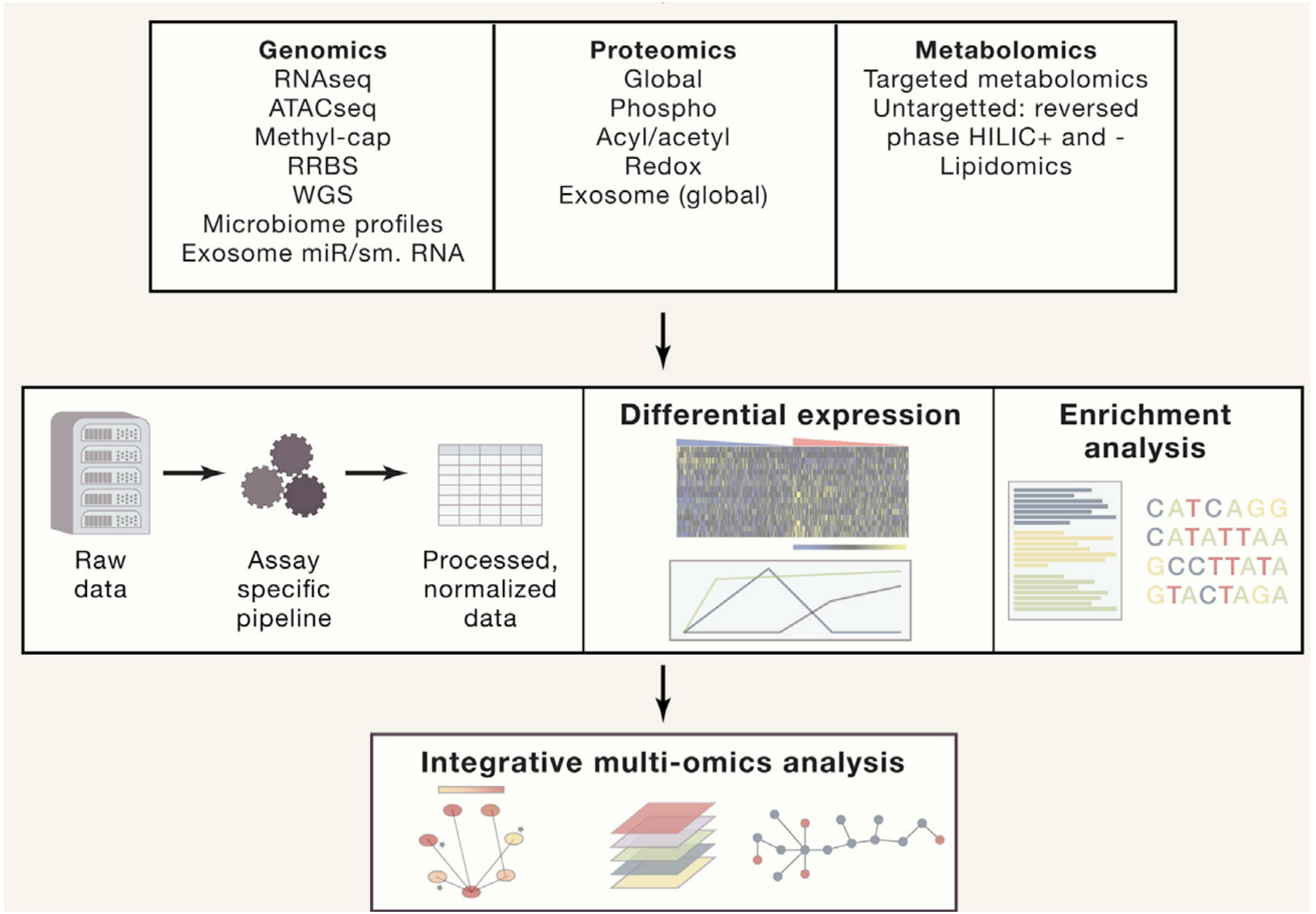
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MoTrPAC Consortium

- Adult Clinical Sites (10 sites) – exercise physiology, exercise clinical trials
- Pediatric Clinical Site (1; UIC)
- Clinical Analysis Sites (6; Broad, Mt. Sinai, Stanford, PNNL, Mayo, Michigan)
- PASS (6, animal)
- Coordinating Center (3; Adm, Biorepository, DMAQC)
- Bioinformatics Center (1; Stanford)
- NIH (4 Institutes and Common Fund)



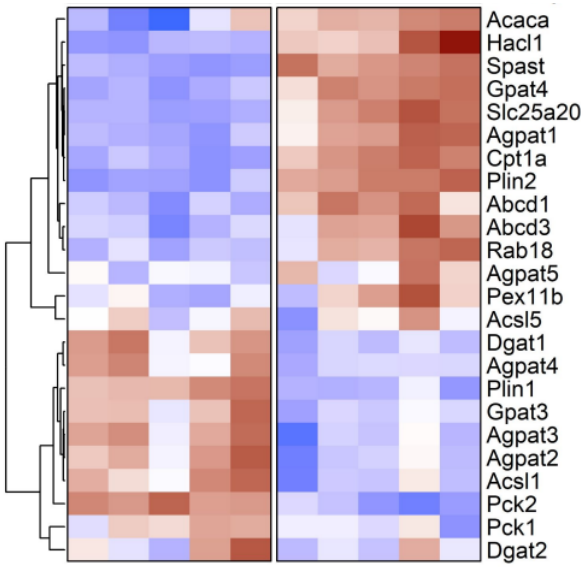
Sandford et al, Cell, 2020

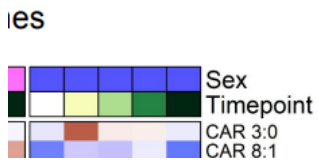
nature metabolism

Resource

https://doi.org/10.1038/s42255-023-00959-9

Sexual dimorphism and the multi-omic response to exercise training in rat subcutaneous white adipose tissue





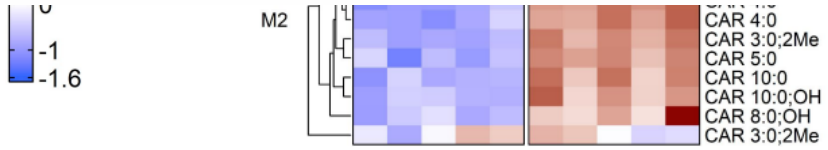
Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

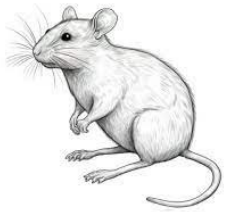
Endurance Exercise Training Alters Lipidomic Profiles of Plasma and Eight Tissues in Rats: a MoTrPAC study

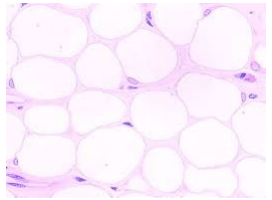
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Sex differences!!!







Steps and Considerations

- Study Design – debate and consensus; HF-ACTION, CALERIE™, MoTrPAC
- Execute the design – COVID
- Collection of samples and data – HF-ACTION, CALERIE™
- Convert samples to data, assembly database – CALERIE™
- Publications, Presentations and Dissemination – HF-ACTION, MoTrPAC

What to do when things go wrong, as they certainly will

