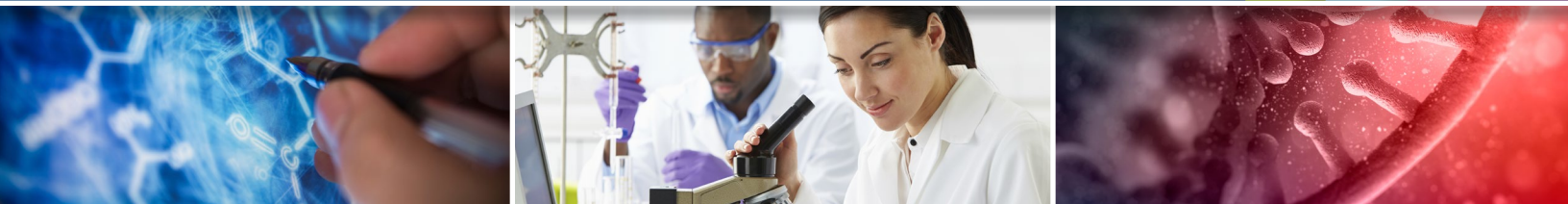


THE NIH COMMON FUND

Bold Science, Catalyzing Discoveries



Molecular Transducers of Physical Activity Consortium (MoTrPAC)

NIH Common Fund

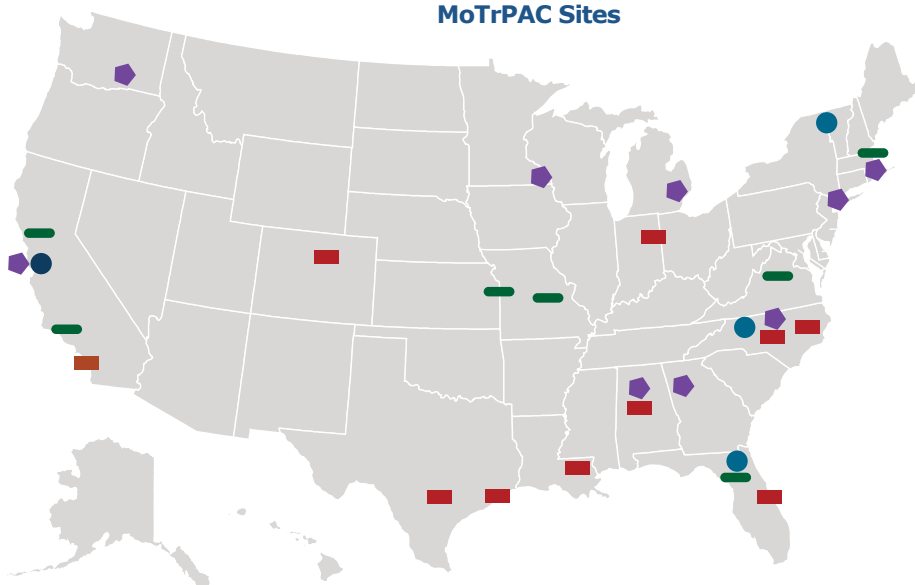
Physical activity—such as exercise—is well known to benefit our health. However, it is not understood what biomolecular changes are caused by movement or how they improve the function of different tissues and organs in the body. The Molecular Transducers of Physical Activity Consortium (MoTrPAC) program aims to uncover, at the molecular level, how exercise improves and maintains the health of the body's tissues and organs. Tracking the impact of endurance and resistance exercise on biological molecules through time will help MoTrPAC researchers create a map of molecular

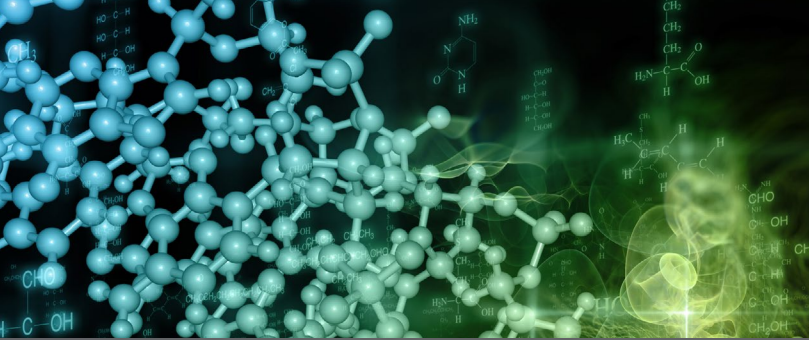
changes in the body. Extensive studies in rats are guiding studies in a diverse set of human volunteers and allow many additional tissue types to be explored, substantially increasing the impact of the consortium. Researchers will use the molecular map produced by MoTrPAC to better understand how exercise affects people of different ages, sexes, body compositions, and fitness levels. In the future, the map also may enable clinicians to make more specific recommendations to patients when using exercise as an intervention to improve health.

Program Initiatives

- **Clinical Sites** are recruiting a diverse group of **adult** and **child** participants to the study.
- **Preclinical Animal Study Sites** are performing rodent exercise studies.
- **Chemical Analysis Sites** are identifying exercise-influenced biological molecules.
- **The Bioinformatics Center** is integrating all collected data.
- **The Consortium Coordinating Center** is coordinating all efforts, including storing and sharing samples.

MoTrPAC Sites





MoTrPAC Study

MoTrPAC investigators are conducting complementary rodent and human exercise studies to develop a molecular map of exercise-related changes in the body. The seven Clinical Sites are recruiting a diverse group of adults spanning a wide range of ages (six sites), as well as pediatric participants (one site). Blood, muscle, and adipose tissue samples will be collected from sedentary and highly active adult volunteers performing resistance or aerobic endurance exercises. Blood samples are collected from sedentary and highly active pediatric volunteers performing aerobic exercises. Sedentary individuals are evaluated before and after 12 weeks of supervised training. Preclinical studies use young (6 months) and old (18 months) rats that have performed either acute or chronic treadmill training exercise. The animal model allows more extensive studies and additional tissue types to be explored beyond what is available from humans.

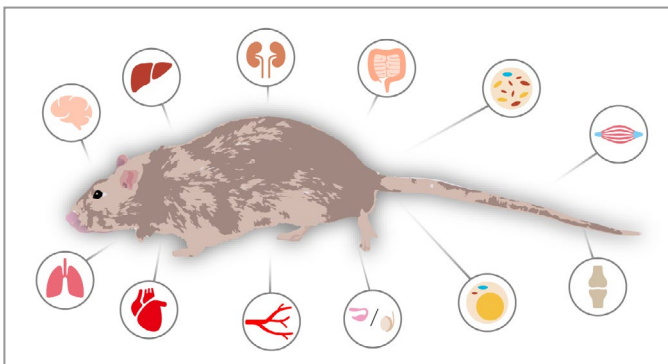
Collected biospecimens include the following:

Human and Rat

- › adipose
- › skeletal muscle
- › plasma
- › whole blood

Rat Only

- › adrenal glands
- › gonads
- › lung
- › aorta
- › heart
- › small intestine
- › bone
- › hippocampus
- › spleen
- › brown adipose
- › hypothalamus
- › white adipose
- › colon
- › kidney
- › cortex (frontal)
- › liver



MoTrPAC Data Hub

The Data Hub provides access to all MoTrPAC study data. An integrative, multi-omics analysis will be prioritized to develop a molecular map of exercise-related changes in the body.

Collected data types include the following:

- › epigenomics
- › metabolomics
- › exercise phenotypes
- › transcriptomics
- › genomics (human only)
- › proteomics

The Data Hub can be accessed through the consortium's website or by visiting motrpac-data.org/.

Program Resources

The following MoTrPAC resources are available online at commonfund.nih.gov/MolecularTransducers/resources:

- › Ancillary Study Policy
- › Recruitment Information
- › COVID Manual of Procedures

To learn more, visit the consortium's website at motrpac.org/.

Connect With Us!



MoTrPAC program website:
commonfund.nih.gov/MolecularTransducers



Listserv: <https://list.nih.gov/cgi-bin/wa.exe?SUBED1=NIH-OSC-L&A=1>



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