

Center for Human Health & Performance (CH²P)



umass.edu/ials/ch2p

Located on the 3rd floor in the Life Science Laboratories the Center for Human Health & Performance (CH²P) is comprised of five core facilities: Exercise Intervention & Outcomes, Human Motion, Living Science, Room Calorimeter, and Sleep Monitoring. Equipment in the CH²P allows for the comprehensive investigation of physiological, biomechanical and behavioral studies.

The core facilities are open to both on-campus and off-campus users. If you are interested in using the core facilities the procedures for access differ depending on your relationship to the University.

We offer training to users to conduct experimentation for use on a fee for service basis to both internal and external researchers, academic or industry based. Following an initial consultation, covering experimental parameters training and access is arranged through the director.

ACCESS

To request access, training, or additional information please contact Michael Busa at mbusa@umass.edu.

Our rates are competitive and based on usage. Visit our website at umass.edu/ials/ch2p for current listing.

TRAINING

Training for new users consists of:

- lab safety training,
- operation of the instrument and associated software,
- use of data analysis software,
- exporting or presenting data,
- clean up and shutdown of the instrumentation.

Once the training is complete, researchers may schedule their experiments through the director of CH²P (Michael Busa) or on line through FOM (Facilities Online Manager) at fom.umass.edu/fom

UMassAmherst | Core Facilities

Institute for Applied Life Sciences
University of Massachusetts Amherst
Life Science Laboratories
240 Thatcher Road
Amherst, MA 01003



Research and Innovation to Translate Basic Science into Product Candidates

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Center for Human Health & Performance Inquiries
Michael Busa, PhD
CH²P Director
S360 Life Science Laboratories
mbusa@umass.edu
(413) 577-0574

umass.edu/ials/ch2p

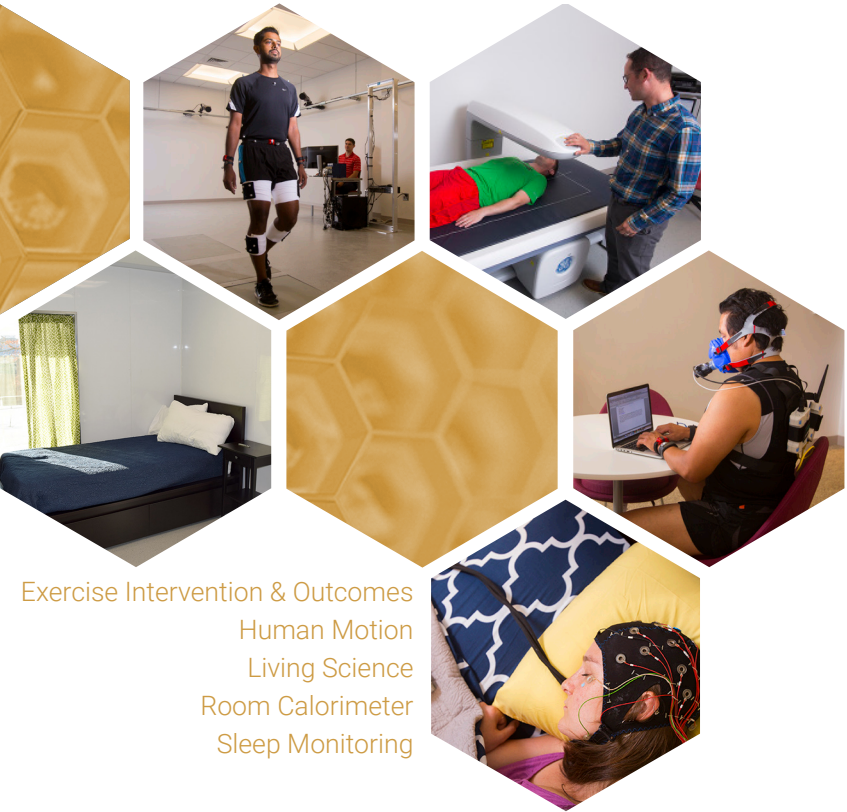
UMass Core Facilities Inquiries
Andrew Vinard
Core Facilities Director
S307 Life Science Laboratories
avinard@umass.edu
(413) 577-4582

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Center for Human Health & Performance

Institute for Applied Life Sciences
University of Massachusetts Amherst



Exercise Intervention & Outcomes
Human Motion
Living Science
Room Calorimeter
Sleep Monitoring

Revision (04/12/19)

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EQUIPMENT

Exercise Intervention and Outcomes

Perform clinical participant intake and evaluation, bone densitometry & body composition, exercise testing, and exercise training



Bone density scanner.

The Exercise Intervention & Outcomes core houses a wide variety of equipment provides researchers with facilities in which they can:

- Evaluate clinical markers of health: height, weight, cardio-metabolic function, strength, and blood/biopsy generated measures.
- Complete participant characterization: strength, metabolic capacity, cardiac function, body composition (bone, fat, muscle) – including separation of visceral and subcutaneous abdominal fat
- Conduct exercise intervention studies in a controlled setting. Participants can be closely monitored to ensure compliance to ensure precision in dose/response measures.
- Evaluate a wide range of health-related biomarkers in the core or utilize other IALS Cores for additional characterization.

Human Motion

Assessment of human motion (i.e. kinematics, kinetics and muscle activity) and segmental and/or muscle coordination with and without robotic assistance/ interaction

Are you a device developer? Do you want to be able to compare your gold standard measures of motion analysis? The Human Motion core houses the equipment necessary to conduct validation and calibration studies for your wearable. Provides the necessary equipment to synchronize many 3rd

party devices (analog and digital) with the existing motion capture system, allowing for easy comparisons between systems.

Living Science

A unique home-like setting where researchers are able to investigate human behavior for prolonged periods

Measurements gathered from the instrumentation allow researchers to gain the information necessary for the calibration and/or validation of wearable activity monitors. Data generated can serve many research study designs, ranging from the development of the next generation of wearable and embedded monitoring devices to basic studies looking to objectively evaluate how individuals spend time in a natural setting. The Living Science core provides:

- Viso video capture and Observer XT video coding software by Noldus, allowing researchers the ability assess both the quality and duration of activity where participants can act “naturally” in this home-like setting.
- Equipped with an Oxycon Mobile metabolic system that can be used to assess energy expenditure and macro-nutrient utilization, for short durations (i.e. 1-2 hours).
- Houses several research grade wearable activity monitors, which allow newly designed devices to be compared to industry standards.

Room Calorimeter

One of only 26 such facilities worldwide, the UMass Room Calorimeter houses two whole room metabolic chambers



Small room calorimeter

The two chambers in Room Calorimeter differ in their capabilities. The smaller (92” x 48”) ‘flex’ chamber can be configured in either a low or high flow setting for the assessment of both resting or exercising metabolism.

The large calorimeter (160” x 131”) is configured for long duration stays during which individuals can receive meals or medications through pass through ports. This chamber houses a toilet, sink, bed, desk, TV (w/ Apple TV), Lode Valiant 2 Treadmill, and a two camera observational video system which allows researchers to encode the video with behavior data to gain in-depth understanding of the interactions between behavior and metabolic cost.

The Room Calorimeter core also has access to the kitchen, in the Human Testing Center, allowing researchers to prepare “metabolic meals.” The ability to tailor diet during time in the chamber allows researchers to investigate the effects of macro nutrient make-up or energy balance on whole-body energy metabolism.

Sleep Monitoring

The only sleep research facility in the region equipped for overnight sleep studies to access sleep and sleep physiology



The facility has three bedrooms that can be used for polysomnography, the gold standard for sleep measurement, which provides the researcher with:

- Online sleep monitoring from a central control room, allowing for sleep stage specific manipulations.
- Bedrooms that are heavily sound-attenuated, temperature controlled, and shielded from electrical noise.
- Access to real-time recordings from the Control Room which allow for monitoring of data quality and manipulations of sleep.
- A laundry facility (for washing room linens), and a sink in the control room for washing electrodes and caps.

**MASSACHUSETTS
LIFE SCIENCES CENTER**

A significant portion of core equipment has been purchased through
MLSC grant funding support.