

2848**Topic Category:** 4092-ASIP Metabolic disorders

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First Author is a: Undergraduate
First Author is a member of: Not a Member of a Host EB Society
First Author Degree:

Presentation Preference: Indifferent

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Sponsor's Society: Pathology - American Society for Investigative Pathology (ASIP) - Host Society

Keywords: 1. Ketones 2. Mitochondria 3. Brown Adipose Tissue

Ketones drive mitochondrial uncoupling in adipose tissue

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Objective. The purpose of this study was to determine the effects of the ketone b-hydroxybutyrate (bHB) on mitochondrial respiration and uncoupling in distinct adipose tissues.

Methods. We used cell, rodent, and human models. 3T3-L1 adipocytes were treated with bHB; in rodents and humans, following a period of ketosis, fat samples were excised and measured for similar mitochondrial outcomes. In each model, mitochondria respiration was analyzed and, where presently available, UCPI levels were measured.

Results. In every model, bHB robustly increased mitochondrial respiration. In rodent tissue, UCPI expression was higher in inguinal fat.

Conclusions. Ketones increase mitochondrial respiration in cells and mammalian adipose tissue, likely via upregulation of UCPI.