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Biology Major
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Glenn Leadership Award



MOREHOUSE
COLLEGE

Obesity and Cancer

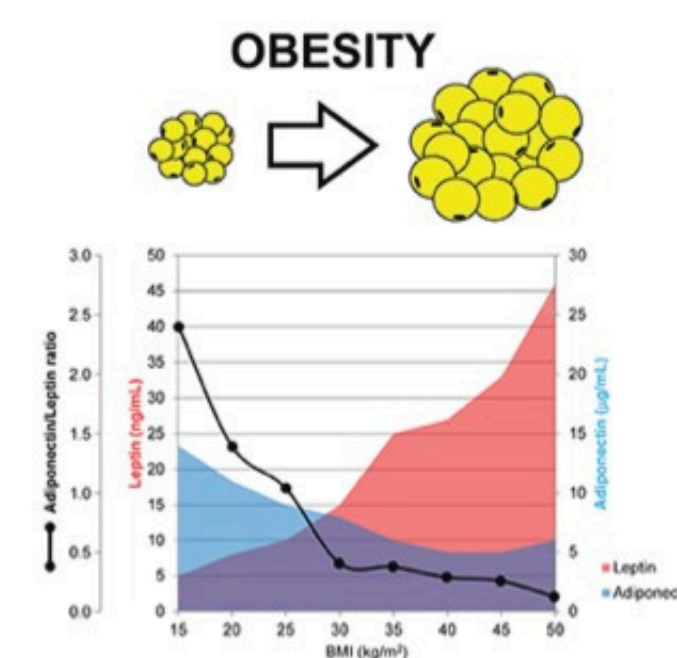
This work aims to understand how obesity promotes resistance to chemotherapeutics in prostate cancer.

Objectives

Objective 1: Determine the leptin signaling pathway responsible for leptin-induced chemoresistance.

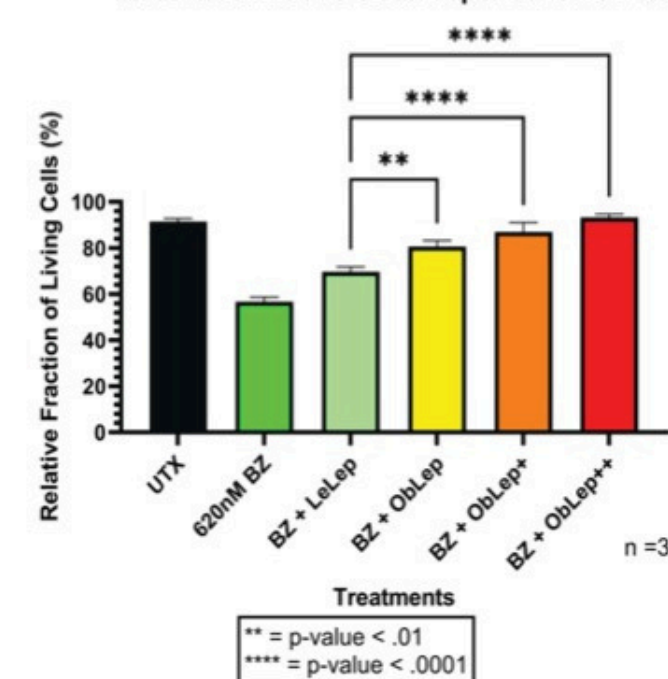
Objective 2: Determine whether adiponectin and its mimetics can restore sensitivity to chemotherapeutics in leptin-protected prostate cancer.

Obesity is Hormonally Regulated

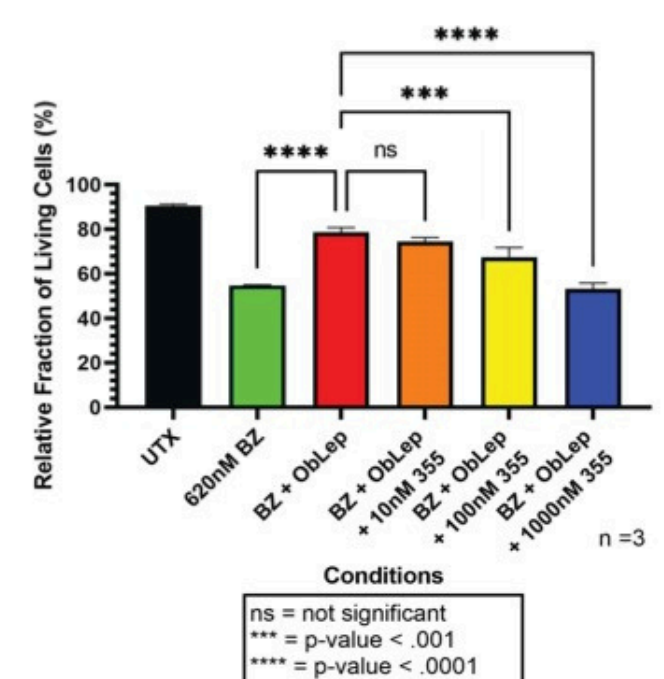


- Fat cells, known as adipocytes, produce hormones called **adipokines** such as **leptin** or **adiponectin**
- Obese people have **higher** levels of circulating leptin in their bodies

Leptin induces insensitivity in LNCaP cells to bortezomib in a dose-dependent manner

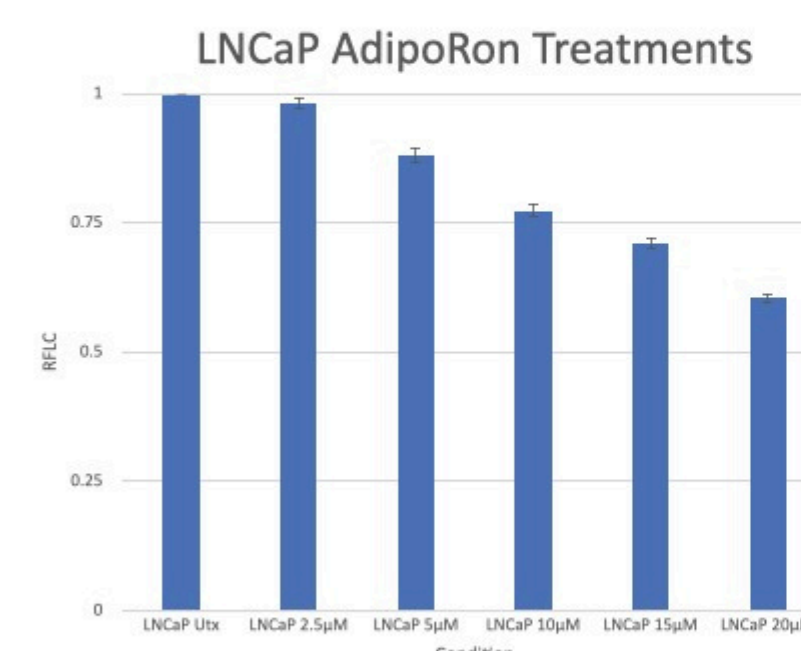


ADP355 restores sensitivity to LNCaP cells at higher concentrations



Higher levels of leptin are directly correlated with resistance to the chemotherapeutic bortezomib (BZ). Adding an adiponectin mimetic (ADP 355) seems to reverse this chemoresistance.

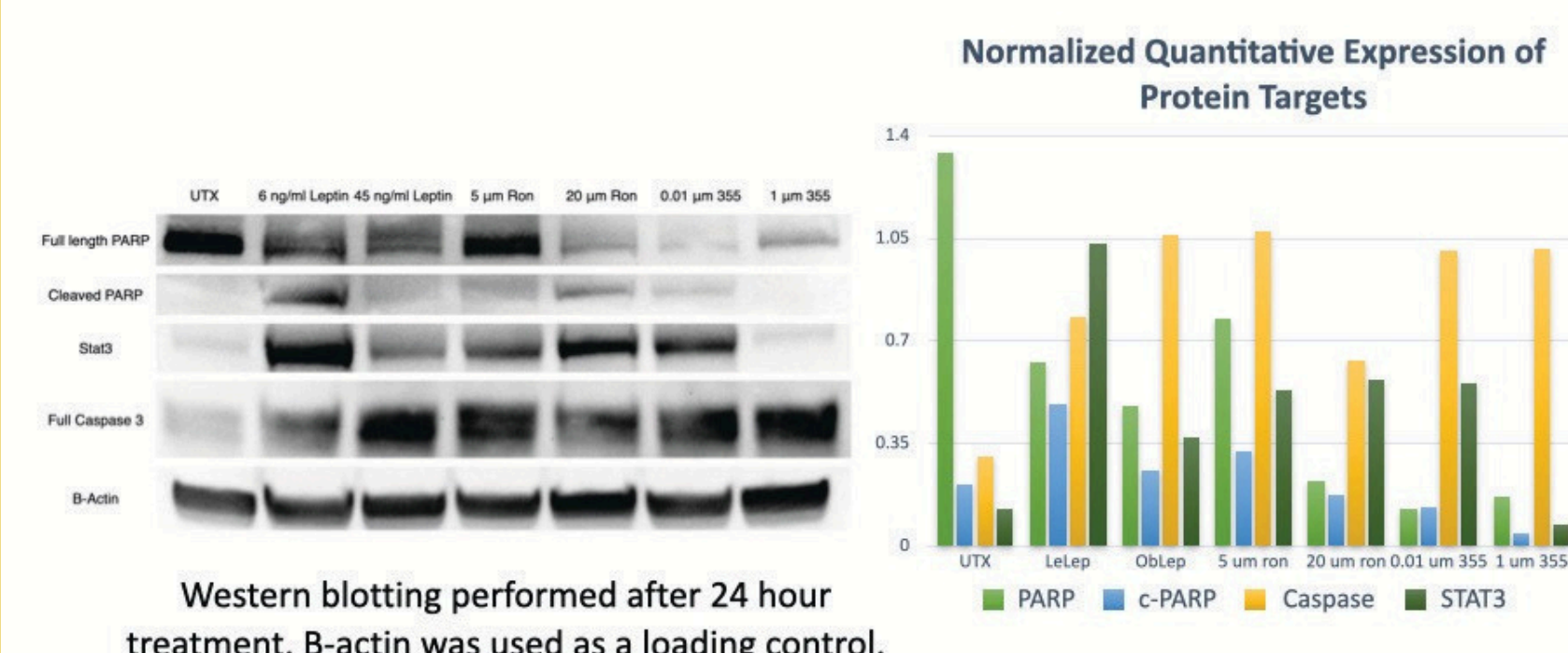
Adiponectin mimetics Cause Cancer Cell Death By Themselves



Graph measures living cells against the concentration of an adiponectin

- This data contradicts the previous assumption that adiponectin mimetics “restore” sensitivity to chemotherapeutics as adiponectin mimetics kill cancer by themselves

Results



Conclusions

- Leptin downregulates the STAT3 pathway
- The ADP 355 and Adiporon have different MOAs
- c-PARP/PARP ratios went up down as leptin concentration increased
- Leptin increases the expression of anti-apoptotic proteins

Future Directions

- Pharmacologically inhibit key parts of the leptin pathway and analyze cell death differences
- Look for other targets in the leptin signaling pathways using western blotting

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Scholar Awards Celebration
November 15, 2023



Igniting
Innovation
in Georgia