Byrdine F. Lewis School of Nursing and Health Professions
Georgia State University
Graduate Program in Health Professions

Thesis Announcement

From:	Department Chair
Cc:	Graduate/Doctoral Program Coordinator Office of Academic Assistance Advisor

RE: Defense Date

☒ Health Professions – Nutrition Thesis

☐ Health Professions – Respiratory Therapy - Thesis

Student Name: Katherine Hobson	Date: (i.e. January 23, 2012) October 22, 2018	Time: (AM/PM) 3:00 PM
Location: Urban Life Building	Room#: 839	Thesis Chairperson: Xiangming Ji

Thesis Title:
Methionine Restriction Inhibits Non-Small Cell Lung Cancer Growth by Targeting the Beta-Catenin Pathway

Abstract:
Background: Lung cancer is the leading cause of cancer related death for both men and women. Non-small cell lung cancer (NSCLC) accounts for 80% of lung cancer with a 15% five-year survival rate. Current treatment options have detrimental side effects creating the need for alternative treatments. Methionine restriction (MR) has shown anti-tumor effects on various cancer cells, but the mechanisms involved in NSLCLC is unclear. β-catenin, an intracellular signal transducer in the Wnt signaling pathway, has been found to be highly expressed in a subset of NSCLC. The purpose of this study is to determine the anti-tumor effects of MR on NSCLC cells through the beta-catenin pathway.
Methods: Human NSCLC cell lines, A549 and H520 were obtained from ATCC and treated in the presence of either normal or MR media (95% methionine restriction). After 48 hours of incubation, cell viability was determined by the alamar blue assay and a clonogenic assay was performed separately. A549 and H520 were treated for 24, 48, and 72 hours and cultured for harvest. Cell cycle was analyzed by measuring the DNA content of cells determined using flow cytometry, and western blot was performed using the antibodies β-actin, β-catenin, phospho β-catenin, and PARP. In order to investigate the potential molecular mechanism of MR on NSCLC cell, a human phospho-kinase array was performed.
Results: MR significantly inhibits the cell proliferation of A549 and H520 cells after 48 hours. MR induces cell cycle arrest in G1 compared with the control after 24 hours of treatment. Protein expressions of PARP and phospho β-catenin are reduced in response to MR. The protein kinase array indicates MR exerts its anti-cancer effects by reducing phosphorylation of beta-catenin.
Conclusion: Our results show that MR has an inhibitory effect on the cell proliferation and colony formation of A549 and H520 cancer cell lines. Cell cycle arrest and reduced phosphorylated β-catenin provides insight into how methionine metabolism inhibits lung cancer development and progression. Further *in vivo* studies are needed to attest the efficacy of MR as a cancer prevention approach for NSCLC.

Signature Department Chair:- Nutrition:	Signature Department Chair:- Respiratory Therapy:
Committee Member	Committee Member
Committee Member	Committee Member
Committee Member	Committee Member

This form should be sent to web coordinator after approval from Department Chair Nutrition/Respiratory Therapy.
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