Project Information

5R21CA164548-02

DESCRIPTION DETAILS RESULTS HISTORY SUBPROJECTS

Project Number: 5R21CA164548-02 **Contact PI / Project Leader:** CHEN, RU
Title: MITOCHONDRIA PROTEOME OF ULCERATIVE COLITIS ASSOCIATED DYSPLASIA **Awardee Organization:** UNIVERSITY OF WASHINGTON

Abstract Text:

DESCRIPTION (provided by applicant): Patients with extensive ulcerative colitis (UC) have a substantially increased risk of colon cancer. The current screening recommendations, which require frequent colonoscopic surveillance of these patients, are expensive, time consuming, and invasive. An objective biomarker of dysplasia would have great clinical value in the management of cancer risk in UC patients. UC-associated cancer progresses from dysplasia to cancer and is associated with mitochondrial dysfunction, which has long been associated with degenerative diseases, cancer, and aging. Our recent proteomics studies reveal that mitochondrial proteins are involved in UC neoplastic progression and could be valuable targets for biomarker development. The objectives of this research are to better understand the role of mitochondrial proteins underlying the neoplastic progression in chronic UC; and further, to employ this knowledge for improved, more cost effective surveillance-to differentiate the subset of UC patients who need colonoscopy from those who do not. In the proposed study, cutting-edge quantitative proteomics and bioinformatics technologies will be applied to discover aberrant mitochondrial proteins that are associated with precursor lesions during UC neoplastic progression (Aim 1). The identified aberrant mitochondrial proteins will be complementarily characterized using immunochemistry (Aim 2) and targeted proteomics (Aim 3). This project may lead to the discovery of protein biomarkers with direct clinical utility in decision-making for colonoscopy and thus could potentially reduce the cost and patient discomfort associated with colonoscopy. Moreover, the proposed comprehensive analysis of mitochondrial proteome will improve the understanding of the mitochondrial proteome in cancer progression, an area for which we currently have very limited information. The study described is based on our unique resource of material obtained from ulcerative colitis patients and the close-knit collaboration of investigators who have been working together for more than ten years. Successful completion of this proposal will lead to: 1) better understanding of alterations in mitochondrial proteome in UC associated dysplasia and cancer; 2) identification of biomarker candidates to predict UC dysplasia, providing a less invasive, cost effective method to assist UC cancer surveillance.

Public Health Relevance Statement:

Ulcerative colitis (UC) is a chronic inflammatory disease of the colon that can eventually cause colon cancer. Because of this, patients with extensive UC require colonoscopy every 2-3 years to look for cancer and pre-cancer. Mitochondria are important organelles that generate most of the energy a cell needs, and abnormal mitochondria have been associated with cancer. Discovery and characterization of alterations in mitochondria associated with UC cancer and pre-cancers could lead to the development of cancer biomarkers. Such biomarkers could be used to help decide which UC patients should have a colonoscopy and which don't need it. This would greatly reduce costs to society and patient discomfort, and improve the ability to target high-risk patients who need intervention.

NIH Spending Category:

Autoimmune Disease; Cancer; Clinical Research; Colo-Rectal Cancer; Digestive Diseases; Inflammatory Bowel Disease; Prevention

Project Terms:

Aging; Area; base; Bioinformatics; Biological Assay; Biological Markers; cancer risk; Cells; Chronic; Clinical; colitis associated cancer; Collaborations; Colon; Colon Carcinoma; Colonoscopy; comparative; Computer-Assisted Image Analysis; cost; cost effective; Decision Making; Degenerative Disorder; Development; Disease; Dysplasia; high risk; Immunochemistry; Immunohistochemistry; improved; Inflammatory; Intervention; Knowledge; Lead; Lesion; Malignant Neoplasms; Methods; Mitochondria; mitochondrial dysfunction; Mitochondrial Proteins; multiplex detection; neoplastic; Organelles; Patients; Proteins; Proteome; Proteomics; Recommendation; Research; Research Personnel; Resources; Risk; Role; screening; Societies; Techniques; Technology; Time; tumor progression; Ulcerative Colitis; Work

Contact PI Information:

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Program Official Information:

Name: VYDELINGUM, NADARAJEN A.
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Other PI Information:

Not Applicable

Organization:

Name: UNIVERSITY OF WASHINGTON
City: SEATTLE Country: UNITED STATES (US)

Department / Educational Institution Type:

INTERNAL MEDICINE/MEDICINE SCHOOLS OF MEDICINE

Congressional District:

State Code: WA District: 07

Other Information:

FOA: PA-11-074
Study Section: Gastrointestinal Mucosal Pathobiology Study Section (GMPB)
Fiscal Year: 2013 **Award Notice Date**: 14-JUN-2013

DUNS Number: 605799469
Project Start Date: 13-JUL-2012
Budget Start Date: 1-JUL-2013

CFDA Code: 394
Project End Date: 30-JUN-2016
Budget End Date: 30-JUN-2016

Administering Institutes or Centers:

NATIONAL CANCER INSTITUTE

Project Funding Information for 2013:

Total Funding: $160,835 **Direct Costs:** $112,466 **Indirect Costs:** $48,369

Year	Funding IC	FY Total Cost by IC
2013	NATIONAL CANCER INSTITUTE	$160,835

Categorical Spending by IC: Click here for more information on NIH Categorical Spending

History:

Project Number	Sub #	Project Title	Contact Principal Investigator	Organization	FY	Admin IC	Funding IC	FY Total Cost by IC
5R21CA164548-02		MITOCHONDRIA PROTEOME OF ULCERATIVE COLITIS ASSOCIATED DYSPLASIA	CHEN, RU	UNIVERSITY OF WASHINGTON	2013	NCI	NCI	$160,835
1R21CA164548-01A1		MITOCHONDRIA PROTEOME OF ULCERATIVE COLITIS ASSOCIATED DYSPLASIA	CHEN, RU	UNIVERSITY OF WASHINGTON	2012	NCI	NCI	$218,330

Subprojects:

Project Number	Sub #	Project Title	Contact Principal Investigator	Organization	FY	Admin IC	FY Total Cost by IC

No Subprojects information available for 5R21CA164548-02

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