Award Number: W81XWH-15-1-0537

Title:
Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Targeted Therapeutics: Liposomal Glutathione and Curcumin

PARTNERING INVESTIGATOR: Nancy Klimas PhD

CONTRACTING ORGANIZATION:
Nova Southeastern University
Fort Lauderdale, FL 33314

REPORT DATE:
October 2016

TYPE OF REPORT:
Annual

PREPARED FOR:
U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT:
Approved for public release; distribution unlimited

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.
<table>
<thead>
<tr>
<th>1. REPORT DATE (DD-MM-YYYY)</th>
<th>2. REPORT TYPE</th>
<th>3. DATES COVERED (From - To)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2016</td>
<td>Annual</td>
<td>30 Sep 2015 - 29 Sep 2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. TITLE AND SUBTITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Targeted Therapeutics: Liposomal Glutathione and Curcumin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5a. CONTRACT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5b. GRANT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>W81XWH-15-1-0537</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5c. PROGRAM ELEMENT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. AUTHOR(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nancy Klimas PhD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5d. PROJECT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5e. TASK NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5f. WORK UNIT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA Medical Center, Miami, FL</td>
</tr>
<tr>
<td>Department of Medicine</td>
</tr>
<tr>
<td>VA Medical Center 111-I</td>
</tr>
<tr>
<td>1201 NW 16th Street</td>
</tr>
<tr>
<td>Miami, FL 33125</td>
</tr>
<tr>
<td>Nova Southeastern University</td>
</tr>
<tr>
<td>College of Pharmacy</td>
</tr>
<tr>
<td>3301 College Avenue</td>
</tr>
<tr>
<td>Fort Lauderdale, FL 33314</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. PERFORMING ORGANIZATION REPORT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Army Medical Research and Materiel Command</td>
</tr>
<tr>
<td>Fort Detrick, Maryland 21702-5012</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. SPONSOR/MONITOR’S ACRONYM(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. SPONSOR/MONITOR’S REPORT NUMBER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. DISTRIBUTION / AVAILABILITY STATEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved for public release; distribution unlimited</td>
</tr>
</tbody>
</table>

| 13. SUPPLEMENTARY NOTES |
We propose to perform a phase I/II study comparing two nutraceuticals and placebo that target mediators identified in our prior dynamic modeling study of Gulf War Illness (GWI). We will repeat the dynamic modeling before treatment and on therapy to assess our modeling and the impact of the interventions on the homeostatic networks we have identified, with an added focus on the glutathione/redox system.

In our prior study “Dynamic Modeling in GWI” we used an exercise stress model (rest, peak VO2, and 7 follow-up sampling points) to measure the mediators of relapse in the context of their interactive homeostatic networks. We surveyed the response of genes and blood-borne biomarkers in order to interrogate and map regulation of neuro-endocrine-autonomic-immune function in these subjects as compared to GW era sedentary healthy controls. We applied an integrative systems-based approach rooted in computational biology connecting gene expression and biomarkers to pathways and to symptoms in order to identify potential therapeutic targets as well as optimal strategies for manipulation of these targets. Using this data we have developed a virtual model of the illness, which we have used to identify potential therapeutic targets. The proposed project is directed at the validation of pharmacologic mediation of illness targets for GWI, identified using an integrative systems-based approach to the study of molecular and cellular markers.

15. SUBJECT TERMS
GWI
Comprehensive Molecular Profiling
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Body</td>
<td>5</td>
</tr>
<tr>
<td>Key Research Accomplishments</td>
<td>6</td>
</tr>
<tr>
<td>Reportable Outcomes</td>
<td>6</td>
</tr>
<tr>
<td>Conclusion</td>
<td>6</td>
</tr>
<tr>
<td>References</td>
<td>7</td>
</tr>
<tr>
<td>Appendix A: Nancy Klimas, M.D. Curriculum Vitae</td>
<td>10</td>
</tr>
<tr>
<td>Appendix B: Richard Deth, Ph.D. Curriculum Vitae</td>
<td>51</td>
</tr>
<tr>
<td>Appendix C: Mary Ann Fletcher, Ph.D Curriculum Vitae</td>
<td>63</td>
</tr>
<tr>
<td>Appendix D: Gordon Broderick, Ph.D Curriculum Vitae</td>
<td>104</td>
</tr>
</tbody>
</table>
**Introduction**

Within months after their return from Operation Desert Storm an alarming number of Gulf War veterans began to report a variety of symptoms, including fatigue, musculoskeletal discomfort, skin rashes, and cognitive dysfunction. During deployment, these troops were subjected to a number of potentially hazardous conditions and multiple hypotheses as to the etiology of Gulf War Illness (GWI) have been considered. The symptoms of (GWI) that are most consistently reported include those which are often reported in Chronic Fatigue Syndrome (CFS). The objective of this study is to improve our understanding of GWI pathogenesis in two ways; by integration across several of the body’s regulatory systems of data and knowledge collected from disparate sources, and by mapping of the coordinated interactions between these physiologic systems and the potential for altered “wiring” of these signaling networks in GWI. Using comprehensive molecular profiling, network and control theory the overarching objective of this proposal is to define the precise nature of these irregularities in immune and neuroendocrine signaling as well as the altered activation states of the corresponding cells such that treatment courses can be designed to redirect the system as a whole to normal pattern of coordinated activity.

**Body**

As noted above, this project involves a clinical trial that serves as both a proof of concept study, using nutraceuticals that target nfKB, identified in our modeling studies, performing before an after dynamic modeling studies of the study volunteers, and refining our modeling work as a result. It should be noted that we have a number of funded studies that aim to improve the modeling that would lead to clinical trials, and all of the data collected in this study serves as data used by our computational modeling staff to test both the utility of intervening at nfKb (in the case of this study) and to provide an increasingly rich and complex data set to inform the other aspects of their studies.

In this study we have a SOW. It should be noted that the start time of the recruitment was delayed by a prolonged HRPO process submitted on our notice of approval in Sept 2015 after a HRPO pre-review and IRB approval; it was HRPO approved April 2016, thus recruitment began shortly afterwards. We have reset our recruitment projections accordingly, still with the intent to complete this study in the 3 year window without the need for carry over funding.

<table>
<thead>
<tr>
<th>Statement of Work</th>
<th>Timeline</th>
<th>MVAMC</th>
<th>NSU INIM</th>
<th>NSU Phar</th>
<th>NSU Stats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) <strong>Major Task 1</strong>: Perform a randomized phase I/II study comparing curcumin BCM-85, 400 mg twice a day to liposomal glutathione 630 mg bid 3 Months intervention and assess safety, efficacy and biomarker response to therapy</td>
<td>Months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-task 1</strong>: Prepare Regulatory Documents and Research Protocol for Study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request pre-IND meeting to determine exemption if necessary submit Investigational New Drug</td>
<td>1</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 TO 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refine eligibility criteria, exclusion criteria, screening protocol</td>
<td>1 TO 2</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalize consent form &amp; human subjects protocol</td>
<td>2 TO 4</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRB protocol submission MVAMC</td>
<td>2 TO 3</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRB protocol submission NSU (with MVAMC revisions if suggested)</td>
<td>2 TO 5</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military 2nd level IRB review (ORP/HRPO)</td>
<td>4 TO 5</td>
<td>NK</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>Status</td>
<td>NK</td>
<td>MF</td>
<td>RD</td>
<td>GB</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Submit amendments, adverse events and protocol as deviations as needed</td>
<td>Needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submit annual IRB report for continuing review</td>
<td>annual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Milestone Achieved: Local IRB approval at MVAMC,</strong></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Milestone Achieved: HRPO approval for all protocols and local IRB approvals</strong></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-task 2: preparation for initiation of clinical trial (staff/space/platform)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Staff definition of duties, cross training</td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinate with study staff to customize web based assessment platform (REDCap)</td>
<td>Complete</td>
<td>1 to 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinate with study staff and research pharmacy a flow chart for all study steps, web data collection and database requirements</td>
<td>Complete</td>
<td>3 to 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mock run of virtual subject through all time</td>
<td>5</td>
<td></td>
<td></td>
<td>GB</td>
<td></td>
</tr>
<tr>
<td>Review platform for HIPAA, permissions, and data retrieval issues</td>
<td>Complete</td>
<td>5</td>
<td></td>
<td></td>
<td>GB</td>
</tr>
<tr>
<td><strong>Milestone Achieved: Research staff trained</strong></td>
<td>Complete</td>
<td>1 to 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Milestone Achieved: 1st participant consented, 7 to 8M screened and enrolled</strong></td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Milestone Achieved: Study begins</strong></td>
<td>Complete</td>
<td>7 to 8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Sub-task 3: Initiation of randomized control clinical trial

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timeframe</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment of subjects, screening, informed consent process</td>
<td>7 to 30</td>
<td>NK Underway</td>
</tr>
<tr>
<td>Completion of exercise challenge and specimen collection before and after 12 weeks of treatment condition</td>
<td>10 to 33</td>
<td>NK Underway</td>
</tr>
<tr>
<td>Monitor and report adverse events to IRB, Data monitoring board chair</td>
<td>7 to 33</td>
<td>NK/GD Ongoing</td>
</tr>
</tbody>
</table>

**Milestone achieved: Clinical trial underway, meeting recruitment goals:**

- 12, 24

**Milestone achieved: last subject (subject 75) initiates study condition**

- 30

**Milestone achieved last subject completes intervention and final assessment**

- 33

**Milestone Achieved: Study begins**

- 7 to 8 m

### Sub-task 4: Biomarkers/lab studies

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timeframe</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review established protocols and establish accession, barcoding and sample flow</td>
<td>1 to 3 m</td>
<td>MF Complete</td>
</tr>
<tr>
<td>Coordinate with study coordinator and lab staff on scheduling, courier to lab during assessments and exercise challenge</td>
<td>3 to 4</td>
<td>NK MF Complete</td>
</tr>
</tbody>
</table>

**Determine batch assays schedule, data entry plan, work with lab information system for direct data entry to REDCap platform**

- 1 to 6 NK MF GB Complete

**Maintain quality control for all assays review with MF weekly**

- 7 to 34 NK MF GB Ongoing

**Run assays as described in protocol, maintaining quality and timely data entry. Stats core to run monthly data status for all investigators**

- 7 to 34 MF GB Ongoing

**Milestone achieved: lab information system platform link to REDCap**

- 6 MF GB Complete

**Milestone achieved completion of all assays with data entered into system**

- 34 Yr 3 MF GB

### Projected enrollment

**Enrollment**

MVAMC

- 4 enrolled, 1 completed, 10 screened

**Goal**

- 75
**Major Task 2 (Specific Aim 2):**
Perform dynamic modeling studies before and after 3 months of therapy, repeating the method used previously in order to compare the response to exercise across groups and better quantify the degree of recovery in treated subjects using an exercise challenge and 9 point in time blood and saliva collections over 24 hours with genomic, cytokine, neuropeptide and cell population studies.

<table>
<thead>
<tr>
<th>Sub-Task 1: Apply previously developed computational modeling to before/after intervention comparisons</th>
<th>1 to 36</th>
<th>Yr 3</th>
<th>GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt computational modeling platform for intervention before/after analyses</td>
<td>1 to 12</td>
<td>complete</td>
<td>GB</td>
</tr>
<tr>
<td>Perform dynamic modeling utilizing group A/B/C designation for interim analyses</td>
<td>24</td>
<td>RP</td>
<td>GB</td>
</tr>
<tr>
<td>Break blind</td>
<td>34</td>
<td>RP</td>
<td>GB</td>
</tr>
<tr>
<td>Completion of final analyses</td>
<td>36</td>
<td></td>
<td>GB</td>
</tr>
<tr>
<td>Final publications and translation plan</td>
<td>34-36</td>
<td></td>
<td>GB</td>
</tr>
</tbody>
</table>

*Milestone achieved: Interim analyses data used in modeling data*

*Milestone Achieved: Report results computational modeling*

**Specific Aim 3: Assessment of antioxidant and methylation-related metabolic status prior to, during and after acute exercise in GWI subjects before and after antioxidant interventions**

<table>
<thead>
<tr>
<th>Major Task 1: Measurement of antioxidant and methylation pathway metabolites and vitamin B12 status</th>
<th>Timeline</th>
<th>Site 1 (Initiating PI)</th>
<th>Site 2 (Partnering PI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtask 1: Thiol and thioether metabolite assays:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPLC assay of redox and methylation pathway thiols and thioethers in plasma (GSH, GSSG, cysteine, cysteine, methionine, homocysteine, homocystine, cystathionine, S-adenosylmethionine, S-adenosylhomocysteine)</td>
<td>1 to 36m</td>
<td>Underway</td>
<td>RD</td>
</tr>
<tr>
<td>• HPLC assay of redox and methylation pathway thiols and thioethers in PBMC mitochondria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 2: Measurement of vitamin B12 status:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPLC assay of vitamin B12 (cobalamin) species in PBMCs (cyanocobalamin, glutathionylcobalamin, hydroxocobalamin, methylcobalamin, adenosylcobalamin)</td>
<td>1 to 36</td>
<td>Underway</td>
<td>RD</td>
</tr>
</tbody>
</table>

**Major Task 2: Evaluation of DNA methylation status**

<table>
<thead>
<tr>
<th>Subtask 1: Global DNA methylation status:</th>
<th>1 to 36</th>
<th>Underway</th>
<th>RD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrosequencing-based assay of LINE-1 nuclear DNA methylation status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtask 2: Mitochondrial DNA methylation status:</td>
<td>1 to 36</td>
<td>Underway</td>
<td>RD</td>
</tr>
<tr>
<td>Pyrosequencing-based assay of MT-ATP6 mitochondrial DNA methylation status</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Milestone #1: Co-author manuscript on redox and methylation status in GWI* 24-36 NK RD
**Key Research Accomplishments**

We prepared regulatory documents and research protocol and the study has received IRB approval for both the VA and Nova Southeastern University, thus the protocol has been finalized and is now being implemented. Study staff has been hired and trained. We have coordinated with the study staff to customize REDCap (web based assessment platform). Pharmaceuticals liposomal glutathione and curcumin, as well as placebo have been received by the VA Clinical Research pharmacist and are available for dispensing. Recruitment and screening has begun. A total of 7 GWI subjects have been screened and consented and enrolled, 3 have been withdrawn. One participant has completed the study and and one other participant is currently on the study protocol. Thus the randomized clinical trial is underway.

The laboratory measures have been established, studies that are run on fresh samples are being completed per protocol, the biorepository has been established and batch samples will be withdrawn as the accrual of samples progresses. Many of the biomarker studies will be run in batches before and after intervention using the biorepository samples. These will be run as accrual reaches, 25, then 50 then 75 subjects.

Dr Richard Deth is the partnering PI at NSU for the companion project addressing Specific Aim 3. Specific aim 3 involves assessment of antioxidant and methylation-related metabolic status prior to, during and after acute exercise in GWI subjects before and after antioxidant interventions. These measurements will be carried out with batched plasma and PBMC samples following accrual of 25, 50 and 75 subjects. A research technician has been hired whose effort is dedicated to this project. In support of these assays a new HPLC system was purchased by Nova Southeastern University and methods for analysis of antioxidant and methylation pathway metabolites as well as vitamin B12 (cobalamin species) have been developed for the new instrument. Assays for measuring global and mitochondrial DNA methylation status have also been developed and are ready for samples.

**Reportable Outcomes**

Only 5 months into accrual, with one subject having completed the 4-month trial, others on treatment with an effective screening and recruitment process in place. Blind will be maintained until the completion of the study, at which point we will be able to report on outcomes.

**Conclusions**

The study has been initiated and recruitment is underway. Samples are being processed for immediate (eg nk cell function, flow cytometry) and batched studies. Our late HRPO approval reset our study accrual baseline, we are therefore adjusting our quarterly accrual figures to complete the study in the 3 year study time frame.

**References**

No publications specifically from his study at this time, though our computational group is using data from this project in their ongoing work and resultant publications. We will not be publishing the study results until end of year 3.
CURRICULUM VITAE

1. Date:

2. PERSONAL:

   2a. Name: Nancy Grace Klimas
   2b. Home Phone: (305) 596-5535
   2c. Home Address: 10700 S.W. 90th Ave
                    Miami, Florida 33176
   2d. Citizenship: US
   2e. Visa Type: None
   2f. Non-Academic Employment: None

3. ACADEMIC EMPLOYMENT: Nova Southeastern University

   3a. Office Address: NSU Institute for Neuro-Immune Medicine
                   NSU Neuro-Immune Medicine Clinics
                   3440 S University Dr
                   Davie, FL 33314
                   Miami VA Medical Center
                   111 –l
                   1201 NW 16th st
                   Miami, FL 33125

   3b. Office Phones: (305) 575-3267(VA); 305-262-2855 (NSU)
       Email: nklimas@nova.edu

   3c. Current Academic Rank: Professor

   3d. Primary Department: Medicine

   3e. Academic and Professional Appointments:

   Current:
   12/1/2011 – present: Chair, Department of Clinical Immunology, COM, Nova Southeastern University, Davie, Fl
   12/1/2011 – present: Director, NSU Institute for Neuro-Immune Medicine, NSU, Davie FL
   3/1/2012 – present; Medical Director, NSU Neuro-Immune Medicine Clinics
12/1/2011 – present: Professor of Medicine, Nova Southeastern University College of Osteopathic Medicine, Davie, FL

12/1/2011- present: Professor Emerita (active), Departments of Medicine, Psychology, Microbiology and Immunology, University of Miami School of Medicine, Miami, FL

1987 - present: Director of AIDS Research, and Co-Director of the AIDS Clinical Research Unit, Miami VA Medical Center

1999 – present: Director, VAMC/NSU CFS/GWI Multidisciplinary Research Center (initiated with NIH Center funding, U01 AI45940)

1985 - present: Co-Director, E.M. Papper Clinical Immunology Laboratory, Miami VA Medical Center and Department of Medicine, University of Miami School of Medicine

2011 – present: Director, GWI and CFS/ME Clinics VA Medical Center, Miami

1/1/2015-12/31/2015: Member of Budget Subcommittee, Miami VA Healthcare System

1/1/2015-12/31/2015: Member of Space Subcommittee, Miami VA Healthcare System

Past:

1984 - 2011: Director, VA Allergy and Immunology Clinic

1996 - 2011: Professor of Medicine, University of Miami Miller School of Medicine, Miami, FL (primary)

1997 - 2011: Professor of Psychology, University of Miami College of Arts and Sciences

1999 – 2011: Professor of Microbiology and Immunology, University of Miami Miller School of Medicine

1987 –2011: Director, University of Miami Diagnostic Immunology and Chronic Fatigue Clinics

2001 – 6 month sabbatical, Centers for Disease Control and Prevention, National Center for Infectious Diseases/ Division of Viral and Rickettsial Diseases, Viral Exanthems and Herpesviruses Branch, “Emperic Case Definition of CFS” working group.

1996 – 1998: Director, West Palm Beach VAMC Allergy Clinic

1991 - 1996: Associate Professor of Medicine, University of Miami School of Medicine

1994 - 1999: Associate Professor of Microbiology and Immunology, University of Miami School of Medicine,

1993 - 1997: Associate Professor of Psychology, University of Miami College of Arts and Sciences
1985 - 1991: Instructor and Assistant Professor of Medicine, University of Miami School of Medicine

1984 - National Cancer Institute Research Fellow; Clinical Immunology Lab, Department of Medicine, University of Miami School of Medicine

4. HIGHER EDUCATION

4a. Institutional:

  Virginia Commonwealth University 9/1972 - 6/1973
  University of South Florida, 9/1973 - 6/1976
  University of Miami, M.D., 8/1976 - 6/1980
  University of Miami Hospitals and Clinics, Medical Residency, 6/1981 – 6/1983
  NCI Fellow; Post-Doctoral Fellowship in Diagnostic Laboratory Immunology, E.M. Papper Laboratory of Clinical Immunology, University of Miami, 6/1983 - 6/1984

5. PROFESSIONAL ACTIVITIES

5a. Certification, Licensure:

  National Boards Part I, II and III
  Florida State Medical License, 1983- current (ME41879)
  American Board of Internal Medicine, 1984
  ABIM Certification in Diagnostic Laboratory Immunology, 1986

  Current hospital affiliations:
  Miami Veteran Affairs Carter Medical Center
  University of Miami Hospital,
  Jackson Memorial Hospital

5b. Publications

  Books Published:


Books currently contracted:

- **Chronic Fatigue Syndrome: A Patient's Guide**  Johns Hopkins Press; Nancy Klimas, MD

Invited Book Chapters Published:

2. **Klimas NG** Gulf War Illness, Encyclopedia of Behavioral Medicine, Springer Press 2011
12. **Klimas, N.G.**, Morgan, R., Van Riel, F., and Fletcher, M.A., Clinical Observations Regarding Use of an Anti-Depressant, Fluoxetine in Chronic Fatigue Syndrome, in

Juried or Refereed Journal Articles:


fatigue syndrome research case definition and recommendations for resolution. BMC Health Serv Res. 2003 Dec 31;3(1):25


91. Fletcher, MA, Maher, K and Klimas, NG. Natural killer cell function in chronic fatigue


**Articles in popular press:**


Klimas, NG “Could a Virus be the Cause of Chronic Fatigue Syndrome?” MS Magazine January 2010

Klimas, NG. “Wake-Up Call. Hopeful new research shows that chronic fatigue syndrome may have a genetic basis”. Ms. Magazine, summer issue, 2006.

**Invited Lectures (last 10 years)**

Gender differences in Gulf War Illness: VA GWI Research advisory committee, Jan 5 2014

Research advances in ME/CFS Patient conference, NYU, NYC November 15, 2013
Treating Chronic Fatigue Syndrome/ ME and Gulf War Illness, Pri-Med Conference 2012 Miami, FL

Grand Rounds lecture, Endocrine issues in CFS/ME and GWI University of Miami Medical School October 2011

“What’s new? Pathogenesis and Treatment 2011” IACFS/ME 10th International Conference, Ottawa, Canada September 19, 2011

Difficult Case Presentations Chair and panelist, IACFS/ME 10th International Conference, Ottawa, Canada September 19, 2011

Death and Dying, Physician/Patient presentation FIU School of Medicine, March 2011, Miami FL

Immune mechanisms of autoimmune diseases: pathogens, self, and chronic disease. FIU College of Medicine, March 2011


8 lecture tour, New Zealand November 2010: Research advances and clinical management of CFS/ME Nov 19 – 30, 2010, Dunedin College of Medicine, and 7 other sites.

Immunology and Biomarker Discovery in ME/CFS. INVEST in ME Science International Science Symposium London, England June 8 2010

Advances in our Understanding of Chronic Fatigue Syndrome, Pri-Med conference Ft Lauderdale Florida Feb 2010

Treatment based on pathogenesis – advances in our understanding of CFS, Fatigue Sciences Conference Calgary Canada Sept 2009

Keynote address (opening) “Immunology of Fatiguing Disorders” 3rd International Conference on Fatigue Science, Okinawa, Japan September 3rd, 2008

Keynote Address “Research Advances in CFS and ME” Canadian Conference on Fatigue and Illness, Calgary, Alberta Nov 12, 2008

“Biomarker Discovery in CFS” 8th annual TMJ Conference Rockville, MD, May 12, 2008

"Research Advances in CFS/ME" Invited lecture Western Pharmacologic Association Kona, Hawaii Jan 29, 2008

Keynote address: Understanding the interactions of the Immune system and the brain in CFS; International CFS/ME Clinical Conference, Oslo, Norway October 8, 2007
Evidence Based Treatment Approaches in CFS/ME;  International CFS/ME Clinical Conference, Oslo, Norway  October 8, 2007

Advances in our understanding of the immunology of CFS;  Keynote 2ndInternational Conference on ME/CFS Biomedical Research, May 25, 2007 Edinburgh, Scotland.

Diagnosis and Management of CFS, Feb 23, 2007 PRIMCARE conference Ft Lauderdale FL, Research Updates, ME/CFS February, 2007, Madrid and Barcelona, Spain, Universad de Catalonia, series of talks to clinicians and patients “


The Diagnosis and Management of ME/CFS, a series of 10 talks to professionals and patients, across the country September, 2006, New Zealand

The Immunology and Genomics of Gulf War Illness – August 14, 2006 GWI Research Advisory Council, Washington, DC

Research Methodology in Fatiguing Illnesses  Keynote Address Aviano, Italy: 1st International Meeting on Chronic Fatigue Syndrome and Cancer-related Fatigue May 5th 2006

Chronic Fatigue Syndrome:  From Genomics to Treatment: Keynote Address, Connecticut ME Association Regional Conference, April 30, 2006 Hartford CT

CFS In the Veteran Population: Best Practices in the Continuum of Care: Management of Infectious Disease Little Rock AR. April 26, 2006

Clinical Management of CFS - PANDORA Conference, West Palm Beach, FL Oct 27, 2005

Research Advances in CFS – Keynote Address , OFFER Regional Conference, Salt Lake City, Utah 4/16/05

Impact of Research Advances on Clinical Management of CFS – Keynote, OFFER Patient Conference, Salt Lake City, Utah 4/16/05

Research Advances in CFS – Keynote Address , CFIDS Asso Regional Conference, Charlotte, NC Nov 13, 2004

Gene Array Technology in CFS – the C³ Computational Challenge, Cold Spring Harbor, Oct 2005

Immunomodulatory therapies – a review, South Florida Allergy Journal Club, 11/04

CFS – advancing knowledge impact on management, Keynote, AACFS Intl Clinical Conference, Madison Wisconsin 10/04

CFS Pathogenesis  Keynote address, Specialization Course on Fibromyalgia and Chronic Fatigue Syndrome International University of Catalonia Barcelona, Spain May 29, 2004.
Honorary degree awarded.

Management of CFS Keynote Address, PANDORA Providers and Patient Conference, Ft Lauderdale Fl. May 11, 2004

The Diagnosis and Management of CFS NMA 2003 Annual Convention and Scientific Assembly, Philadelphia, August 2003

Immune Methodologic Issues, invited speaker NIH CFS Methodology Workshop June 2003, Bethesda, MD

CFS and Fibromyalgia – Diagnosis and Management NPACE, May 2003 Orlando Fl

CFS: What we know, what we need to know, and how to get there. New Jersey Medical Association, New Brunswick. May 2003

CFS: What we know, what we need to know, and how to get there., Regional Primary Care Conference Salt Lake City May 2003

CFS – Somatic or Physical? A Debate, Intl Behavioral Medicine Asso, Helsinki, Finland August 2002

Instruments and Design of an Empiric Case Definition Study, CDC CFS Case Definition Workshop, Calloway Gardens, May 2002

Diagnosis and Management of CFS, National American Medical Women’s Association Conference, San Antonio, TX Jan 2002

Inclusion and Exclusion Criteria, CDC CFS Case Definition Workshop, Calloway Gardens, May 2001

Immunology of Chronic Fatigue Syndrome, State of the Science Meeting, NIH, October 2000


Immune Restoration Post Antiretroviral Therapy, Guest lecturer, Hollywood Memorial Hospital; Baptist Hospital; Mercy Hospital; Broward General Hospital; VAMC, Nashville Tennessee; Mobile, Alabama; Key West Florida; Jan – April 2005


Housestaff/Medical Student lectures (given regularly throughout all academic years): Anaphylaxis; Asthma; Immune Modulatory Therapies; Global Impact of HIV; Immune restoration in HIV infection; Hepatitis C; Hepatitis C; HIV Co-infection; Death and Dying – the Clinician’s role; Chronic Fatigue Syndrome; Gulf War Syndrome; Psychoneuroimmunology; Stress and Disease.
Graduate Studies Lectures: Multidisciplinary Clinical Research; Immunology 101; Psychoneuroimmunology and disease; Pathogenesis of HIV/AIDS; Chronic Fatigue Syndrome

Undergraduate Lectures: Careers in clinical research, Death and Dying

Other Works and Publications

Reports


Letters to the Editor


Editorials


Abstracts and Presentations at National and International Meetings


15. Fletcher, M.A. and Klimas, N.G. Polyclonal B cell activation (PBA) and the Incidence of Antibody to HTLVIII/LAV (AB) in Groups at Risk for Acquired Immunodeficiency Syndrome (AIDS). 6th International Congress of Immunology, Toronto, 1986.


AIDS, Montreal, 1989.


73. Keller, R., van Reil. F., Maislis, J., Lane, J., Reiter, W., **Klimas, N.G.** and Fletcher, M.A. Correlation of DR4 and DQ1 with immunologic defects in CFS. Presented at the International Research Conf. on Chronic Fatigue and Immune Dysfunction Syndrome, Albany, N.Y., 1992.


89. Lutgendorf, S., Antoni, M., Ironson, G., Klimas, N., Kumar, M., Schneiderman, N. and Fletcher, M.A. Neuroendocrine and immune effects of a psychosocial intervention in
symptomatic HIV seropositive gay men. Presented at the PsychoNeuroImmuno

90. Patarca, R., Pons, H., Garcia, M., Klimas, N. and Fletcher, M.A. Cytokine patterns in
chronic fatigue syndrome. Presented at the Chronic Fatigue Society, Research Meeting, Ft. Lauderdale, FL, 1994

91. Patarca, R., Klimas, N.G., Walling, J., Yue, X.-S., Garcia, M., Pons, H. and Fletcher, M.A.
CD8 T cell-associated cytokine gene expression programs in AIDS. Intrn. Society of
Chemotherapy - Biologic Response Modifiers, Cancun, Mexico, Abstracted in J.

92. Patarca, R. Klimas, N.G., Walling, J., Yue, X.-S., Garcia, M., Pons, H., Sandler, D.,
Friedlander, A. and Fletcher, M.A., CD8 T cell immunotherapy in AIDS: Lessons learned at
the cellular and molecular biology levels. presented FASEB meeting Atlanta, GA, 1995.

93. Maher K, Asthana D, Patarca R, Klimas NG, and Fletcher MA. CD69 on CD4 and CD8

94. Maher K, Patarca R, Hutto C, Scott GB, Martin N, Klimas NG, and Fletcher MA.
Immunological Correlates Among Children With Perinatally-Acquired Human
Immunodeficiency Type-1 Virus Infection Association of Medical Laboratory Immunologists,

MA. The effect of Highly Active AntiRetroviral Therapy on Viral Load and the Immune
System in Human Immunodeficiency Virus (HIV) Infection. NY State Wadsworth

Fletcher, MA. T-lymphocyte subsets and highly active anti-retroviral therapy (HAART)
therapy of human immunodeficiency virus (HIV) infection, selected for oral presentation.


98. Klimas, N. Highly active anti-retroviral therapy: implications for adherence and
immunomodulatory interventions. Academy for Behavioral Medicine Research, Cape Cod,
1998.

99. McPherson, S., Malow, R., Penedo, F.J., Jones, D., Maggio, C., Triplett, J., Klimas, N.,
Enhancing adherence to combination antiretroviral therapy in non-adherent HIV+ men.
Presented at the annual meeting of the American Psychological Association, Boston, MA,
1999.

100. Klimas, NG - Immunology of CFS, Regional Behavioral Medicine Conference, Auckland
New Zealand, Nov 2000

101. Klimas, NG, McPherson, S Adherence and Chronic Active Hepatitis C – what we have
learned from HIV, 25th Intl behavioral Medicine Society Conference, Brisbane, Australia Nov 2000


106. **Klimas, NG**, speaker: Adherence to Therapy Seminar, 26th International Behavioral Medicine Society Conference, Helsinki, Finland, August 2002


109. **Klimas NG** and Turgeli, E Assessment Tools in CFS, AACFS Intl Conference Madison Wisconsin, October 2004

110. [Jeffrey Greeson, Maria Llabre, **Nancy Klimas**, Peter Lawrence, Alex Gonzalez, Pedro Martin, Neil Schneiderman, Barry Hurwitz](https://www.ncbi.nlm.nih.gov/pubmed/19880797) Psychological Distress and HIV Disease Progression: Role of Natural Killer Cell Immunity; 2005 Annual Meeting of the American Psychosomatic Society, March 2-5, in Vancouver, Canada

111. Elevations of HHV-6 serology are associated with low NK cell Function, **Nancy Klimas**, Mary Ann Fletcher, Kevin Maher. International Conference on HHV6 Infection, Barcelona Spain May 1-3, 2006.

112. **Klimas, NG** and Fletcher MA Neuropeptide Y in CFS and GWI, IACFS International Conference, Fort Lauderdale 2007

113. Vera, M, **Klimas, N**, Garcia L., Fletcher MA Isoprinosine in CFS (presentation) IACFS/ME Research Conference Reno Nevada, March 2009


120. Fletcher MA, Klimas NG and Broderick G Biomarkers for Chronic Fatigue Syndrome and Gulf War Illness, International Science Symposium on Myalgic Encephalomyelitis/Chronic Fatigue Syndrome Bond University, Queensland. Australia. 3-4 December 2010.


5c. Research (Past 5 years):

Funded:

NIH  April 2016-March 2018 $182,520
“Male-specific genomic mechanisms of transcriptional regulation of ME/CFS/SEID”
Lubov Nathanson, PI, Nova Southeastern University; Role Co-I

NIH  August 2015-July 2016 $766,133
“Microbial Discovery and Immunity in ME/CFS” Role: PI

DoD  June 2015-June 2018 $560,000
“Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Therapeutics: Liposomal Glutathione and Curcumin.” Role: PI

NIH R15  April 2015-March 2018 $320,000
“Genomic Approach to Find Novel Biomarkers and Mechanisms of CFS/ME”
Lubov Nathanson, PI, Nova Southeastern University; Role: CO-I

DOD  June 2015-June 2018 $805,000
“An integrated genomics and cell biology approach to correlate novel GWI indicators of infections and neuro-inflammatory mechanisms with targeted drug therapy”
Paula Waziry, PI, Nova Southeastern University; Role- CO-I

VA Merit  July 2014-July 2018 $450,000/year
“Gender Differences in GWI and Dynamic Modeling” Role: PI

NIH RO1 August 2014 – July 2018 $450,000/year
“Gender Differences in CFS/ME and Dynamic Modeling” Role: Co-PI

DOD September 2013-September 2017 $4,100,000
Gulf War Illness Consortium “Understanding GWI: An Integrative Modelling Approach” Mariana Morris, PI, Nova Southeastern University; Role: Co-PI, Clinical Core PI

DOD September 2014-September 2017 $190,000
Gulf War Illness Consortium “Brain Immune Interactions as the basis for GWI”, Kim Sullivan, PI, Boston University; Role CO-I

CDC Contract:
Developing a clinical data base for longitudinal studies in CFS
Role site PI, co-investigator
$230,000/year Start date May 2012, 5 year contract

Recent:

NIAID RO1 October 2010 – September 2015
"Genetic pathway Analysis in ME/CFS" 450,000/year 4 years with one year extension South Florida Veterans Foundation for Research and Education Role: PI

NIH RO1 2010 – 2015
“Virtual platforms for CBT in CFS/ME” Mike Antoni, PI, University of Miami; Role: Co-PI

NIAID R21 2011- 2015
“Microbial Translocation in ME/CFS” Mary Ann Fletcher, PI, Nova Southeastern University; Role-CO-PI

NIAID RO1 (2011-2012)
“The role of XMRV in CFS” PI, Ian Lipkin, Columbia University
Role: National Clinical Core Coordinator and Miami site PI 2 year study local budget $125,000

"The Use of Comprehensive Molecular Profiling with Network and Control Theory to Better Understand GWI and Model Therapeutic Strategies" Award Number W81XWH-09-2-0071, $500,000 (direct costs total over 3 years) Role: PI

R01AI065723 - 01 12/1/06 – 11/30/11, no cost extension through 11/30/12 Immunologic Mechanisms, Biomarkers and Subsets in CFS
NIAID (PI MA Fletcher)
Goal of this project is to determine the immunologic basis for CFS pathogenesis
Role: Co-PI

CFI (Chronic Fatigue Initiative): A Clinical and Biosample Database to Enable Discovery of
Pathogens and Pathogenic Mechanisms in ME/Chronic Fatigue Syndrome,
Role: PI  Funding approx $1,400,000 over 2 years. 2/2011-2/2013

R21: 12/01/2008 – 12/31/2011 (continuation year)
Neuropeptide Y and dipeptidyl-peptidase IV (CD26) in chronic fatigue syndrome
NIAAA (PI MA Fletcher)
Goal of this project to determine the relationship of neuropeptide Y and dipeptidyl-peptidase IV
to natural killer cell cytotoxicity in CFS.
Role: Co-PI, R21AA016635-01

Merit Review 11/05 – 11/10
Longitudinal follow up of GWI and CFS patients
Veterans Administration
Study of immune function and clinical symptoms in patients with Gulf War Illness.
Role: PI

Merit Review 9/06 -8/10
Gene Array Analysis of Gulf War Illness and Chronic Fatigue
Veterans Administration
Gene Array Analysis of Gulf War Illness and Chronic Fatigue Syndrome
Role: PI

Foundation Research grant 03/07 – 03/09
Mechanisms of Cytotoxic Cell Dysfunction in CFS
CFIDS (PI N Klimas)
Study of killer cells in CFS
Role: PI, 15% UM effort

R01MH066697 09/04/03-6/30/08
Psychobiological Processes and Health in HIV/AIDS
NIMH R01 (PI G. Ironson)
This grant examines psychological and biological (CTL, NK, cortisol) predictors of disease
progression in HIV/AIDS.
Role: Co-I. 5% UM effort

R01 9/30/06-8/31/10
Virtual Cognitive Behavioral Therapy in Chronic Fatigue Syndrome
NIMH (PI M Antoni)
Evaluate CBT utilizing phone and web based interventions
Role: Co-I, 5% UM effort

NIH sponsored Clinical Trial 2000 - 2009
Immune Restoration with IL-2 in HIV infection – the ESPRIT study
Role: Site PI

RO1 HL72712 09/30/02-08/31/07
HIV/HCV Co-Infection: HAART and CVD Pathophysiology
NIH/NHLBI (PI Hurwitz)
Role: Co-I

5d. Editorial Responsibilities:

- Founding Editor: Journal of Chronic Fatigue Syndrome
- Ad hoc reviewer, NEJM
- Ad hoc Reviewer, Journal of Clinical Immunology
- Ad hoc Reviewer, JAMA
- Ad hoc Reviewer, Annals of Internal Medicine
- Ad hoc Reviewer, AIDS
- Ad hoc Reviewer, JAIDS
- Ad hoc Reviewer, Psychosomatic Medicine
- Ad hoc reviewer, Brain Behavior and Immunity
- Ad hoc reviewer, PLoS one
- Ad hoc reviewer, Psychoneuroimmunology

5e. Professional and Honorary Organizations:

- International Association for CFS/ME (previously AACFS), President 2003-2009
- International Academy of Behavioral Medicine
- Fellow, Academy for Behavioral Medicine Research
- International Association of Psychoneuroimmunology
- American Society for the Advancement of Science;
- Association of Medical Laboratory Immunologists
- Clinical Immunology Society
- Association of Women in Science;
- American Medical Woman’s Association
- University of Miami Medical Women
- Florida Medical Association
- Dade County Medical Association
- Gauze Ceiling Coalition (Miami Dade County Medical Women)

5f. Honors:

2016- World Class Faculty Award recipient by the Greater Fort Lauderdale Alliance
2015 - NSU Fifth Annual Provost's Research and Scholarship Award
2013 – IACFS/ME Perpich award for contributions to the field
2011 – IACFS/ME Nelson Gantz Memorial Award for distinguished clinical service
2011 - NOW Foundation’s second annual Victoria J. Mastrobuono Women's Health Award
2011 - Distinguished Alumni Award, University of Miami Medical Alumni Association
2010 - May A Brunson Award for Achievement University of Miami Women’s Commission
2009 – Award named to honor research achievements “Nancy Klimas Research Excellence Award” awarded annually at the IACFS/ME Research Conference
2004 – Honorary Degree, University of Catalonia, Barcelona Spain.
1998 - Fellow - Academy for Behavioral Medicine Research
1992 - Iron Arrow (University of Miami Honor Association)
1985 - American Cancer Society Institutional Research Award
1984 - National Research Service Award
1983 - Southern Medical Association Research Award
1982 - Finalist Beecham Award, Southern Blood Club
1982 - Finalist Burroughs-Wellcome Young Investigator Award

5g. Other Professional Activities:

**Miami VAMC AIDS Clinical and Research Unit**: Developed and wrote the proposal for the Miami VAMC AIDS Clinical and Research Unit, which was one of 3 selected for funding. The proposal included 3 million dollars in construction funds as well as infrastructure support. This resulted in one of the top VA HIV/AIDS clinical and research programs in the US, which is still in operation. Dr. Klimas is Director of AIDS Research and Co-director of the Clinical HIV/AIDS program at the Miami VAMC. 1987 to present

**South Florida CFS and GWI Research Center**: Initially funded with an NIH center grant (Klimas, PI), and since supported with NIH, VA, DOD, and private foundation grants, the center is a clinical, translational, and basic science center that integrates research across disciplines. Current studies include genomics, immune, neuroendocrine studies, a natural history study, and clinical trials. Dr. Klimas is Center PI and coordinates the research efforts of four research interdisciplinary groups.

**Canadian Government advisor** in the development of the Clinical Case Definition for Chronic Fatigue Syndrome/Myalgic Encephalitis 2001, which is being revised in 2008.

**6 month deployment CDC 2001 –**, Molecular Epidemiology Program Viral Exanthems and Herpesvirus Branch, Developed the international protocol currently underway to empirically define CFS.

**IACFS/ME**
Dr. Klimas served as President of the International Association for Chronic Fatigue Syndrome (a national professional organization of investigators and clinicians) from 2005-2007 and was re-elected for another 3-year term in January of 2007. She organized the IACFS conference in Fort Lauderdale in January, 2007, and the conference in Reno Nevada in March 2009. Each of these conferences were attended by 400 patients and 350 professionals, and provided a unique opportunity for patients to meet and talk with leading international researchers and clinicians.

**CFSAC: Chronic Fatigue Syndrome Advisory Committee**
In 1996, Secretary for Health Donna Shalala chartered a special committee to advise the Department of Health and Human Services (DHHS) on policy regarding chronic fatigue syndrome (CFS), also known as chronic fatigue and immune dysfunction syndrome or CFIDS or Myalgic Encephalomyelopathy (ME). This committee, known as the DHHS Chronic Fatigue Syndrome Coordinating Committee (CFSCC), brought together officials representing various health agencies together with seven appointed members of the public to improve coordination of federal CFS programs. A year 2000 review of federal activities on CFS conducted by the General Accounting Office prompted several changes. Among them was the replacement of the
CFSCC with a standing committee, the CFS Advisory Committee (CFSAC), whose structure more closely matched other DHHS advisory bodies. Secretary Michael Leavitt most recently renewed the charter on August 30, 2006. Nancy Klimas served on this committee from 1997 to 2000. She was reappointed to another three-year term on the committee in 2007, which has been extended to 2011. She chairs the quality of life and education subcommittees.

NSU COM Institute for Neuro-Immune Medicine: A newly conceived program using clinical care templates to help diagnose and manage complex CFS/ME cases while collecting research data and developing the patient base for clinical trials work. Working with a basic science pathogenesis team, a computational biology team and a biomarkers discovery group, the institute merges clinical care with scientific discovery to promote new knowledge that can be applied to clinical care through rapidly employed translational clinical trials.

5h. Consultantships

1987 - 1990 - VA National AIDS Steering Committee
1987 - 1990 - VA National AIDS Research Subcommittee
1987 - 1991 - VA Train the Trainer National AIDS Education Program
1988 - Present - VA National AIDS Prevention and Counseling Training Program
1988 - Present - Special Review Committee, National VA AIDS Prevention and Education
1990 – 2000 - VA National HIV Therapeutics Advisory Committee
1991 - 2000 - Board of Directors, American Association for Chronic Fatigue Syndrome (An international professional organization of investigators and clinicians).
2002 – 2006 - Board of Directors, International Association for Chronic Fatigue Syndrome/ME (An international professional organization of investigators and clinicians).
1992 - Chairperson of the Program Committee for the First International Meeting: Chronic Fatigue Syndrome, held in Albany NY, sponsored by the AACFS, NIH and CDC.
1994 - Local Coordinator and Program Committee member for the Second International Meeting: Chronic Fatigue Syndrome research Conference, held in Ft Lauderdale, October 1994, sponsored by AACFS, NIH, CDC, and Univ. of Miami.
1994 - Chairperson of the Program Committee for the CFS Clinical Conference, held in Ft. Lauderdale, October 1994, sponsored by AACFS.
1991- 1997 Consultant to Center for Special Immunology, Inc., Ft. Lauderdale, FL.
1993 - 2000 - Board of Directors, American Association for Chronic Fatigue Syndrome.
1993- Present Medical Advisory Board, Chronic Fatigue and Immunodeficiency Syndrome
1993- 1998 - Medical Advisory Board, Environmental Health Foundation.

2000 NIH State of the Science CFS Conference planning committee

2001 – present Name Change subcommittee, HHS CFS coordinating Committee

1999-present – CDC CFS Case Definition Revision Committee

2001 Canadian CFS Clinical Case definition expert panel

2001 CDC Expert Advisory Panel – long term outcomes study

2002 – present NIH reviewer and site visitor GCRC applications

2001- present Ad Hoc reviewer, Medical Research Council, United Kingdom.

2003 –present NIH reviewer CFS Special Emphasis Panel

2003 Brighton Collaboration on CFS Case Definition

2003 Elected to the Board of Directors, AACFS, 7 year term

2005 - 2009 President of the International Association for Chronic Fatigue Syndrome – this international organization of investigators and clinicians sponsors international and regional meetings, has developed a peer review journal, and works with government and regional groups to develop curricula and provider education programs.

2007 – 2012 CFSAC HHS Advisory committee to the Secretary of Health and Human Services

2008-2010 Chair HHS CFSAC subcommittee on Education

2010 – 5/2012 Chair, HHS CFSAC subcommittee on Quality of Life and Education

2010 International CFS/ME Case Definition working group,

2011 CFIDS Association of America Scientific Advisory Board

2011 Chronic Fatigue Initiative national coordinator, clinical sites.

2012-present Nova Southeastern University Research Advisory Committee

2011-present Nova Southeastern College of Osteopathic Medicine Research Committee

2013 – Research Advisory Committee for Gulf War Illness, VA Health care Systems

2013 - Institute of Medicine CFS Committee reviewing case definition and name
2013 - NIH Advisory Committee P2P program to develop research priorities in CFS/ME related research

5i. TEACHING

Teaching Award:

Woman Faculty Member of the Year, 1989, UM Medical Women.
May Brunson Award, Woman Faculty Member of the Year, University of Miami 2010 (University of Miami Women's Commission)

Recent Teaching Responsibilities:

Housestaff, Graduate Program, Medical School and Undergraduate lecturer (see lectures listed above)

General topics:
Clinical Immunology, Medical Laboratory Immunology, HIV Infection, Health and Human Values: Psychoneuroimmunology, Allergy and Immunology, CFS, Gulf War Illness, Stress and Disease.

Internal Medicine, Ward Attending, VA Medical Center (3 months/ year)

Allergy Clinic rotations for medical students, housestaff and Harrington Latin American Scholars.

HIV and Immunology rotations for medical students, housestaff and Harrington Latin American Scholars

Nationally/Internationally consulted in the development of CME course work for clinicians in the diagnosis and treatment of CFS in collaboration with the CDC and CFIDS Association of America

Dissertation Advising:

Masters and Doctoral Students in University of Miami Psychology program (9 PhD candidates/3 MS candidates over last 5 years)

6. SERVICE TO THE UNIVERSITY

6a. University of Miami and VAMC Committees:

3. Faculty Sponsor, UM Medical Women, 1985 - 2011
6. VA Research and Education Foundation Board of Directors – 1999- present
7. UM Search Committee - AIDS/HIV senior and junior research faculty 2004-2011
8. Selection Committee – applicants for AAMC Women in Medicine Leadership Program
10. Executive Committee, Behavioral Medicine Research Center, 1999 - 2011
11. University of Miami Committee on Rank Salary and Conditions of employment 2003-2004
12. VA Research Committee, alternate 2004-present
13. UM Faculty Senate Professional Conduct Panel 2003 – 2011
14. University of Miami Miller School of Medicine Self Study LCME Women and Minority subcommittee 2007- 2009

Nova Southeastern Committees (2012 forward):

1. Nova Southeastern University Research Advisory Committee
2. Nova Southeastern College of Osteopathic Medicine Research Committee

6b. Clinical Responsibilities

1. Director, CFS and GWI Clinical and Research Center, NSU and Miami VAMC
2. Co-director of VA Medical Center AIDS Clinical Unit,
3. HIV/AIDS Primary Care Clinic (Silver Team) – attending Monday clinic, and backing up Wednesday clinic. Daily oversight of 2 ARNP clinics.
4. General Medicine teaching attending, VAMC
5. Director, Miami VAMC Allergy Clinic, Tuesday MD clinic, and oversight of RN clinic and RN and ARNP clinic
6. Medical Director NSU Neuro Immune Clinics, Davie, FL and Kendall FL – training staff and overseeing quality of care in this clinic utilizing the CFS clinical care templates developed and implemented in this demonstration project site.

Consistently ranked “Outstanding” in the annual VAMC and university proficiency reporting, including clinical skills, teaching, productivity and administration.

7. Community Activities

Health Crisis Network, Co-Founder and Past Chair of the Medical Advisory Committee and Board of Directors. (Currently Co-Cure Foundation, a Miami Dade HIV related community health organization) 1984, 1985-89

Member, National Task Force on Women's Health Issues, NOW (1995-present)

People with AIDS Coalition (PWAC), Board of Directors 1993-95

PWA Housing Coalition, Board of Directors 1993-95

Women's Emergency Network, Board of Directors 1998/99

Bessie Garrett Foundation – Homeless children outreach, Board of Directors 1999 – 2009

National Organization for Women, Health Advisory Board, 1992-2002
PANDORA – advocacy for people with neuro-inflammatory disorders, board of directors 2007 – present

CFIDS Association of America – Scientific Advisory Committee
RICHARD CARLTON DETH, PhD

I. Personal Data and Education:
   A. Personal Data:
      Home Address: 9765 Dovetree Isle Drive
                     Boynton Beach, Florida 33743

      Work Address: Nova Southeastern University
                     3200 South University Drive
                     Fort Lauderdale, Florida 33328-2018

      Contact Information: Telephone (Work) (954)-262-1332
                           (Cell) (617)-678-0147
                           FAX (954)-262-2278
                           EMAIL rdeth@nova.edu

   B. Education:
      1965-1970 Bachelor of Science (Pharmacy)
                    S.U.N.Y. at Buffalo
      1970-1975 Doctor of Philosophy (Pharmacology)
                    University of Miami, School of Medicine

II. Professional Experience:
   A. Post-Doctoral Training
      1975-1976 Catholic University of Leuven (Belgium)

   B. Professional/Administrative Experience
      1972-1976 Registered Pharmacist, State of Florida
      1976-1981 Assistant Professor of Pharmacology,
                    Northeastern University, Boston, MA
      1981-1982 Section Leader, Pharmacology
      1981-1987 Associate Professor of Pharmacology
      1982-1986 Director, Pharmacy Program
      1987-Present Professor of Pharmacology
      1990-1992 Chairman, Department of Pharmaceutical Sciences
      2013-Present Research Professor
                    Florida Atlantic University
      2014-Present Professor of Pharmacology
                    Nova Southeastern University
                    Florida Atlantic University
                    Professor of Pharmacology
                    Nova Southeastern University

III. Memberships:
      Rho Chi, Sigma Xi, Phi Kappa Phi (Honor Societies)
      Society for Neuroscience
      American Society of Pharmacology and Experimental Therapeutics
      Society of Biological Psychiatry
      International Society for Autism Research
IV. Current Research Interests:

1. Role of redox and methylation status in neurodevelopmental disorders.
2. Receptor-dependent regulation of gene expression via epigenetic mechanisms.
3. Involvement of epigenetic mechanisms in drug addiction
4. Role of D4-dopamine receptor-mediated phospholipid methylation in psychiatric illnesses.
5. Redox and methylation effects of casein/gluten-derived opiate peptides.

V. Teaching Experience

Course coordination and lectures in undergraduate and graduate-level pharmacology courses.
Lecture areas have included:

Graduate: Molecular modeling, cardiovascular pharmacology and physiology, neuropharmacology, and receptor pharmacology

Graduate Student Advisees:
- Seventeen Ph.D. Thesis Students
- Five M.S. Thesis Students
- Service on numerous thesis committees

VI. Scientific Advisory Board Memberships

Current:
Autism Research Institute
Immunotec Inc.
Focus for Health

Previous:
National Autism Association

VII. Grant Support

Current:

1. R001 PI: R. Deth 7/1/2015-6/30/2016 1.0 calendar A2 Milk Corporation $28,750
   Effects of BCM7 on uptake and transport of essential micronutrients

   Testing the Model: A Phase I/II Randomized Double Blinded Placebo Control Trial of Targeted Therapeutics: Liposomal Glutathione and Curcumin

   Examination of neuroimaging, cognitive functioning and plasma markers in a longitudinal cohort of Gulf War deployed veterans: The Ft. Devens Cohort

VIII. Publications:

A. Articles:


76. Yeter, D., **Deth, R.** ITPKC susceptibility in Kawasaki syndrome as a sensitizing factor for autoimmunity and coronary arterial wall relaxation induced by thimerosal's effects on calcium signaling via IP3. Autoimmunity Reviews. 2012 Apr 1. [Epub ahead of print]


IX. Monograph:

Deth, R.C. “Molecular Origins of Attention: The Dopamine-Folate Connection”

X. Patents:

1. “Compositions and methods for diagnosing schizophrenia” Inventor: Richard C. Deth; Patent# 5686255; Date of issue: Nov. 11, 1997. Claims restricted to the diagnosis of schizophrenia and related psychiatric disorders with novel laboratory tests involving D4 dopamine receptor-mediated phospholipid methylation.


3. “Methods and materials for the diagnosis and treatment of schizophrenia and related disorders” Inventor: Northeastern University/Richard C. Deth; Patent# 6,080,549; Date of issue: June 27, 2000.
4. “Methods of identifying and determining the effectiveness of therapeutic processes or agents for the treatment of schizophrenia and related disorders” Inventor: Northeastern University/Richard C. Deth; Patent # 6,773,892; Date of issue: August 10, 2004.
NOVA Southeastern University
Curriculum Vitae

I. PERSONAL

1. Name: Mary Ann Fletcher
2. Home Phone: 305-596-5535
3. Office Phone: 954-465-5120
4. Home Address: 10700 SW 90th Ave, Miami, FL 33176
5. Current Academic Rank: Schemel Family Endowed Professor
6. Primary Department: Clinical Immunology
7. Citizenship: USA

II. HIGHER EDUCATION

1. Texas Technological College, B.S. (honors), Major, Microbiology, 1959
2. University of Texas, M.A., Chemistry, 1961
3. Baylor University, Ph.D., Microbiology and Immunology, 1966
4. Northwestern University, immunochemistry, postdoctoral fellowship, 1966-68

III. CERTIFICATIONS AND LICENSURES

1. Diplomat American Board of Bioanalysis - High Complexity Laboratory Director, Clinical & Technical Consultant
2. State of Florida licensed and CLIA certified as Clinical Laboratory Director

IV. EXPERIENCE

1. 2013 –present: Schemel Family Endowed Professor, Institute for Neuro-Immune Medicine, College of Osteopathic Medicine, NOVA Southeastern University, Davie, FL
2. 2013-present: Director, INIM E.M. Papper Clinical Immunology Laboratory, NOVA Southeastern University, Davie, FL
3. 1981 - 2013: Tenured Professor of Medicine, University of Miami Miller School of Medicine, Miami, FL
4. 1982 – 2013: Professor of Microbiology/Immunology, UM Miami School of Medicine, Miami, FL
5. 1989 - 2013: Professor of Psychology, UM, Coral Gables, FL
6. 1982 - 2013: Director, E.M. Papper Clinical Immunology Laboratory, UM School of Medicine, Miami, FL
7. 1978 - 2013: Member of the Graduate Faculty, UM, Coral Gables, FL
8. 1978 -1981: Associate Professor of Microbiology, UM School of Medicine, Miami, FL
9. 1977 - 1981: Tenured Associate Professor of Medicine, UM School of Medicine, Miami, FL
10. 1972 – 1976: Assistant Professor of Medicine, UM School of Medicine, Miami, FL
11. 1970 - 1972: Adjunct Assistant Professor of Biology, Illinois Institute of Technology, Chicago, IL
12. 1969 -1972: Assistant Director, Division of Hematology, Michael Reese Hospital and Medical Center, Chicago, IL
13. 1969 -1972: Assistant Attending Physician, Special Staff, Michael Reese Hospital and Medical Center, Chicago, IL. 
14. 1967 -1969: Instructor and Asst Professor, Dept. Microbiology, Northwestern University Medical School, Chicago, IL
15. 1966 - 1969: Postdoctoral fellow, Northwestern University, Evanston Hospital, Evanston, IL
16. 1963 - 1966: Research Associate, Graduate Research Institute of Baylor University, Dallas, TX
17. 1962 - 1963: Clinical Bacteriologist, Spohn Hospital & Driscoll Found. Hospital, Corpus Christi, TX
18. 1959 - 1961: Research Assistant, Dept Microbiology, Univ. of Texas, Southwestern Medical School, Dallas, TX.

V. PUBLICATIONS (BOOKS AND MONOGRAPHS)


VI. PUBLICATIONS (REFEREED JOURNAL ARTICLES)

2. Prager, M.D. and Fletcher, M.A: Mechanisms of the Effect of Trypsin on Specific


72. Baum, M.K., Javier, J.J., Mantero-Atienza, E., Beach, R., Fletcher, M.A., Sauberlich, H.E.,


123. Goodkin, K., Feaster, D., Tuttle, R., Blaney, N., Kumar, M., Baum, M., Shapshak, P., and Fletcher, M.A. Bereavement is associated with time-dependent decrements in cellular immune function in asymptomatic human immunodeficiency virus type 1-seropositive homosexual men.

11


142. Wilkie F L; Goodkin K;Eisdorfer C;Feaster D;Morgan R; Fletcher M A;Blaney N;Baum M;Szapocznik J. Mild cognitive impairment and risk of mortality in HIV-1 infection. J Neuropsych Clin Neurosci. 10: 125-32,1998.

143. Lutgendorf S K; Antoni M H; Ironson G; Starr K; Costello N; Zuckerman M; Klimas N; Fletcher M A; Schneiderman N. Changes in cognitive coping skills and social support during cognitive behavioral stress management intervention and distress outcomes in symptomatic human immunodeficiency virus (HIV)-seropositive gay men. Psychosomatic Med. 60: 204-14,1998.


229. Seay JS, McIntosh R, Fekete EM, Fletcher MA, Kumar M, Schneiderman N, Antoni MH. Self-reported sleep disturbance is associated with lower CD4 count and 24-h urinary dopamine levels in ethnic minority women living with HIV. Psychoneuroendocrinology. 2013 Jul 10. pii: S0306-4530(13)00239-4. doi:


VII. US PATENTS HELD

1. Bovine Glycoproteins and Use in Diagnosing Infectious Mononucleosis. 4,460,694
2. New Purified Glycoproteins and Their Use in the Diagnosis of Infectious Mononucleosis. 4,525,459

VIII. PUBLISHED ABSTRACTS AND PRESENTATIONS
Lectin binding Differences Between Sublines of a Rat Prostate Adenocarcinoma.  Proc. 4th Int. Cong. of Immunol. 10-4-75, 1980.


43. Fischl, M.A., Ahn, Y.S., Klimas, N.G., Harrington, W.J. and Fletcher, M.A. Use of Danzol in Autoimmune Thrombocytopenia Associated with the Acquired Immunodeficiency Syndrome. Ist Internatl. Conf. on AIDS, Atlanta, 1985

44. Baron, G.A., Klimas, N.G., Fischl, M.A. and Fletcher, M.A. Natural Cell Mediated Cytotoxicity (NCC) to Cell Line K562 per Leu 11 Positive Cell is Decreased in the Acquired


51. Klimas, M.A., Lubs, M. and Fletcher, M.A. Complement (C') Activation and Immune Complex (IC) Formation in Asymptomatic Women with Multiple Miscarriages. 6th International Congress of Immunology, Toronto, 1986

52. Fletcher, M.A and Klimas, N.G. Polyclonal B cell activation (PBA) and the Incidence of Antibody to HTLVIII/LAV (AB) in Groups at Risk for Acquired Immunodeficiency Syndrome (AIDS). 6th International Congress of Immunology, Toronto, 1986

53. Baron, G. and Fletcher, M.A. Abnormal Populations of Natural Killer Cells and Decreased Natural Cell Mediated Cytotoxicity in Patients with AIDS Related Complexes (ARC). 6th International Congress of Immunology, Toronto, 1986


61. Caldwell, K.E. and Fletcher, M.A, Studies on the Interaction of Mammalian Erythrocyte


67. Ironson, G., O'Hearn, P., LaPerrier, A., Antoni, M., Ashman, M., Schneiderman, N. and Fletcher, M.A. News of Anti-HIV Status and Immune Function in Healthy Gay Men. Accepted as Citation Poster at the 9th Annual Society Behavioral Medicine, Boston, MA, April, 1988.


78. Blaney, N., Klimas, N.G. Fletcher, M.A. and Morgan, R. Mood State, Social Support and


120. Ingram, F., LaPerriere, A., Antoni, M., O'Hearn, P., Schneiderman, N., Fletcher, M.A. and Ironson, G. Correlates of Depression Along Healthy Gay Males Awaiting Notification of HIV-1 Antibody Test Results. Tenth Annual Society of Behavioral Medicine, Chicago, IL, April, 1990.


135. Transfusion Safety Study Group represented by Fletcher, M.A. Co-infection with HIV-1 and HTLV; Effect on Lymphocyte Phenotype. 7th Internatnl. Conf. on AIDS, Florence, Italy, 1991.


141. Patarca, R., Harrington, W., DeLaCruz, V and Fletcher, M.A. Differential Patterns of Soluble Immune Mediators in HIV-Infected Individuals with EBV-Positive or Negative B cell Lymphomas. 7th Internatnl. Conf. on AIDS, Florence, Italy, 1991.


153. Allarriacin, C., Patarca, R., Martinez, G., Palacio, J., Barbosa, E. and Fletcher, M.A. Elevated IgA Levels as an Early Indicator of HIV-1 Infection in Columbians. vol 2, A42. Presented at the 8th Internatl. Conf. on AIDS, Amsterdam, 1992.


162. Baum, M., Shor-Pazner, G., Quesada, J., Cure, N., Fletcher, M.A., Page, J. Nutritional Abnormalities in Intravenous Drug Users (IVDUs): Impact of HIV-1 Status. IXth Intl. Conf. on


196. Maher K, Patarca R, Hutto C, Scott GB, Martin N, Klimas NG, and Fletcher MA. Immunological Correlates Among Children With Perinatally- Acquired Human Immunodeficiency Type-1 Virus Infection Association of Medical Laboratory Immunologists, Vail, CO, 1995

197. Fletcher, M.A. Cytokine abnormalities in CFS. Clinical Immunology Society. New Orleans, 1996.


212. Dixon, D., Antoni, M., Kilbourne, K., Wagner, S., Schneiderman, N. and Fletcher, MA. Social


216. Maher K and Fletcher MA. Flow Cytometric Analysis of Natural Killer Cell Perforin Content Correlates with Lytic Potential Clinical Applications of Cytometry, Palm Springs, CA Cytometry, 38:341, 1999


231. Ironson G, Balbin E, Stieren E, Detz K, Fletcher MA, Schneiderman N, Kumar M. Perceived stress and norepinephrine predict the effectiveness of the response to protease inhibitor


244. Fletcher MA. Immunology of CFS/ME. State of Knowledge Workshop. Myalgic Encephalomyelitis/Chronic Fatigue Syndrome Research. NIH. Bethesda, MD. April 7-8, 2011.


249. Kremer H, Ironson G, Kaplan L, Stuetzele R, Fletcher MA. Compassionate Love as a Predictor of


IX. FUNDED RESEARCH

Research Support

NIH
Proposal Number: 1R21AI124187-01
Project Title: “Male-specific genomic mechanisms of transcriptional regulation of ME/CFS/SEID”
Principal Investigator: Lubov Nathanson
Role: CO-I

DoD
Proposal Number: W81XWH-15-1-0537
Project Title: “Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Therapeutics: Liposomal Glutathione and Curcumin.”
Principal Investigator: Nancy Klimas
Role: Co-PI

NIH R15
Proposal Number: 1R15NS087604-01A1
Project Title: “Genomic Approach to Find Novel Biomarkers and Mechanisms of CFS/ME”
Principal Investigator: Lubov Nathanson
Role: Co-I

DOD
Proposal Number: W81XWH-15-1-0163
Project Title: “An integrated genomics and cell biology approach to correlate novel GWI indicators of infections and neuro-inflammatory mechanisms with targeted drug therapy”
Principal Investigator: Paula Waziry
Role: CO-I

DoD
Proposal Number: W81XWH-15-1-0582
Proposal Name: High Fidelity Design of Multi-Modal Restorative Interventions in Gulf War Illness

4/6/2016-3/31/2018
7/1/2015-6/30/2018
4/15/2015-3/31/2018
7/1/2015-6/30/2018
9/30/2015-9/29/2018
Principal Investigator: Gordon Broderick  
Role: Co-I  

VA Merit  
Proposal Number: 4/1/2014-3/31/2018  
Project Title: “Gender Differences in GWI and Dynamic Modeling”  
Principal Investigator: Nancy Klimas  
Role: Co-I  

NIH RO1  
Proposal Number: 9/1/2014 – 7/31 2018  
Project Title: “Gender Differences in CFS/ME and Dynamic Modeling”  
Principal Investigator: Mary Ann Fletcher  

Gulf War Illness Research Program  
Proposal Number: GW120045, consortium award  
Project Title: “Understanding Gulf War Illness: An Integrative Modeling Approach”  
Principal Investigator: Mariana Morris  
Role: Co-I laboratory studies of immune and genomics in the animal and human subjects, 20% effort  

Research Support (last 5 years)  
2R56AI065723-06A1 (PI MA Fletcher) 12/15/2006 – 08/31/2014  
Immunologic Mechanisms, Biomarkers and Subsets in CFS/ME  
Goal of this project was to determine the immunologic basis for CFS pathogenesis  
Role: PI 15% effort  

2R56AI065723-06A1 (PI MA Fletcher) 12/15/2006 – 08/31/2014  
Immunologic Mechanisms, Biomarkers and Subsets in CFS/ME  
Goal of this project was to determine the immunologic basis for CFS pathogenesis  
Role: PI 15% effort  

R21 AI099809-01 (PI MA Fletcher) 08/15/2012 – 08/14/2014  
Microbial Translocation in ME/CFS  
Goal of this project is to determine the relationship of “leaky gut” to symptoms and biomarkers in ME/CFS.  
Role: PI 20% effort  

GW093042 DOD (PI G Broderick) 08/01/2010 – 07/30/2013  
Theory-Driven Models for Correcting "Fight or Flight” Imbalance in Gulf War Illness  
A computer-based analysis of the hypothalamic-pituitary-adrenal (HPA) axis, the immune system, and the ability of those systems to ensure survival and then to re-establish homeostasis that existed prior to the “fight or flight” stimulus.  
Role: co-I  

NIAMSD 1 R01 AR057853-01A1 (PI NG Klimas) 12/01/2010 – 04/30/2014  
Study of Chronic Fatigue Syndrome using comprehensive molecular profiling with network and control theory
The objective of this study is to improve our understanding of CFS pathogenesis by using broad-scale molecular profiling to create a comprehensive assessment of status in several of the body’s regulatory systems.
Role: Co-PI 20% effort

NIH NIMH RO1 (PI Mike Antoni) 2010 -2015
Virtual platforms for CBT in CFS/ME
A study of spouse and patient CBT using a virtual platform.
Role: Co-I, 7% effort

GW080152 DOD (PI N Klimas) 06/2009 – 06/2012
The Use of Comprehensive Molecular Profiling with Network and Control in GWI
GWI patients are studied using gene array technology and neuron-endocrine-immunologic profiling pre-post exercise challenge.
Role: co-PI

R01AI065723-08 (PI MA Fletcher) 10/01/2006 – 09/30/2014
Immunologic Mechanisms, Biomarkers and Subsets in CFS
Goal of this project was to determine the immunologic basis for CFS pathogenesis
Role: PI

R21AA016635 (PI MA Fletcher) 09/30/06 - 05/31/09
Neuropeptide Y and dipeptidyl-peptidase IV (CD26) in chronic fatigue syndrome
2R56AI065723-06A1 (PI MA Fletcher) 12/15/2006 – 08/31/2014
Immunologic Mechanisms, Biomarkers and Subsets in CFS/ME
Goal of this project was to determine the immunologic basis for CFS pathogenesis
Role: PI 15% effort

R21 AI099809-01 (PI MA Fletcher) 08/15/2012 – 08/14/2014
Microbial Translocation in ME/CFS
Goal of this project is to determine to relationship of “leaky gut” to symptoms and biomarkers in ME/CFS.
Role: PI 20% effort

GW093042 DOD (PI G Broderick) 08/01/2010 – 07/30/2013
Theory-Driven Models for Correcting “Fight or Flight” Imbalance in Gulf War Illness
A computer-based analysis of the hypothalamic-pituitary-adrenal (HPA) axis, the immune system, and the ability of those systems to ensure survival and then to re-establish homeostasis that existed prior to the “fight or flight” stimulus.
Role: co-I

NIAMSD 1 R01 AR057853-01A1 (PI NG Klimas) 12/01/2010 – 04/30/2014
Study of Chronic Fatigue Syndrome using comprehensive molecular profiling with network and control theory
The objective of this study is to improve our understanding of CFS pathogenesis by using broad-scale molecular profiling to create a comprehensive assessment of status in several of the body’s regulatory systems
Role: Co-PI 20% effort

NIH NIMH RO1 (PI Mike Antoni) 2010 -2015
Virtual platforms for CBT in CFS/ME
A study of spouse and patient CBT using a virtual platform.
Role: Co-I, 7% effort

Gulf War Illness Research Program 2013-2017
Proposal Number: GW120045, consortium award
Project Title: “Understanding Gulf War Illness: An Integrative Modeling Approach”
Principal Investigator: Mariana Morris
Role: Co-I laboratory studies of immune and genomics in the animal and human subjects, 20% effort

X. PROFESSIONAL SOCIETIES

American Association of Immunologists; American Society for Microbiology; American Society for the Advancement of Science; Society for Complex Carbohydrates; Association of Women in Science; Society for Experimental Biology and Medicine; Society for Clinical Cytology; Association of Medical Laboratory Immunologists, Steering Committee, 1987; Clinical Immunology Society; PsychoNeuroImmunology Research Society, Scientific Affairs Committee - 1993 1995; American Association of Bioanalysts, Association of Clinical Chemists

XI. HONORARY SOCIETIES and HONORS

Phi Kappa Phi, Alpha Epsilon Delta, Alpha Lambda Delta, Sigma XI, Fellow - Academy for Behavioral Medicine Research

IACFS Award for Outstanding Research in CFS/ME - 2011

XII. CONSULTANTSHIPS

National Cancer Institute (NCI), Tumor Immunology Review Committee 1980 - 1982

NCI - Clinical Cancer Program Project Review Committee Site Visit Participant, 1978 - 1984

National Science Foundation (NSF), Postdoctoral Fellowship Review Committee, 1979 - 1980

NSF Ad Hoc Review, 1979 - 1986

National Institutes of Health (NIH), Immunotechnology Special Review Committee, 1986-87


National Institute of Drug Abuse (NIDA), Site Visitor, 1988


National Institute of Allergy and Infectious Diseases (NIAID), Special Review Committee, In vitro methods for AIDS Clinical Trials, 1995

NIAID, Ad Hoc reviewer for AIDS study section, 1991;
XIII. EDITORIAL BOARDS AND REVIEWING

Clinical Applications in Cytometry; Clinical and Diagnostic Immunology; Journal of Chronic Fatigue Syndrome; Clinical and Applied Immunology Reviews; Section editor: ASM Manual of Medical Laboratory Immunology, 5th edition. Ad Hoc reviewer, FASEB, Natural Immunity, Annals Internal Medicine, Journal of Immunology, Psychosomatic Medicine, Brain Behavior and Immunity, Journal Infectious Diseases, Journal of Translational Medicine, American Journal of Physiology, PLoS one.

XIV. TEACHING

Specialization: Immunology, Medical Laboratory Immunology, Psychoneuroimmunology

Mentor: Pre-doctoral trainees:

Martin Rosenthal, 2006-2008
Zachary Barnes, 2008-2009
Natalie Hone, 2009

Mentor - Ph.D. candidates:

Karen Caldwell, Ph.D., M.D. 1982 - 1989
George Ann Baron, Ph.D. 1983 - 1987
Brian Esterling, Ph.D. 1989 - 1991

Mentor – Post-doctoral fellows:

Patricia Kozlovskis, Ph.D.1980-1981
Zuhair Latif, Ph.D.1980-1983
Nancy Klimas, M.D.1983-1984
Lisetti Said, M.D.1980-1983

HHS, Member Chronic Fatigue Syndrome Advisory Committee
Gerson Silveria, M.D. 1984-1985
Olga Torres, M.D. 1985-1986
Fernando Salvato, M.D. 1987-1989
Roberto Patarca, Ph.D. M.D. 1990-1994
Kevin Maher, Ph.D., 1993-1994
Hector Pons, Ph.D., 1994-1995
Maria Jose Miquez-Burbano, M.D. 1994-1996
Desh Asthana, Ph.D., 1994 - 1997
Denise Dixon, Ph.D., 1997 – 1999
Lina Garcia, M.D., 2007-2009
Maria Vera, M.D., 2008-2009

Thesis and Dissertation Committees:

Elaine Young 1976-1978
Stephen Obenauf 1979-1983
David Charish 1979-1982
Caroline Petty 1979-1982
Scott Buessow 1984-1984
Alicia Sinclair 1984-1985
Marijane Montogomery 1984-1985
Gordon Watson 1985-1989
Peter O'Hearn 1986-1989
Arthur Laperrier 1987-1988
H. Lane Bagget 1989-1990
Sharon August 1990-1991
Andrea Friedman 1990-1993
Kathleen Starr 1992-1995
Susan Lugtendorf 1993-1994
Teresa Woods 1996-1998
Deidre Pereira 1996-1998
Mark Zuckerman 1996-1998
Frank Penedo 1997- 1999
Saroch Motivala 1997- 1999
John Malonovitch 1997- 1999
Staci Wagner 1998 - 2001
Kristian Kilbourn 1999 - 2002
Tammy Enos 1998- 2001
Steven Burke, 1999-2002
Connor O’Cleirigh 2000 -2006
Adam Carrico 2004 – 2007
Orit Weitzman 2004
Blake Scalon 2005 – 2007
Corina Lopez 2009 – 2010
Emily Lattie 2011 –
Julia Seay 2011 -

XV. SCHOOL AND DEPARTMENTAL COMMITTEES AND OFFICES

15. Department of Medicine Appointment, promotion and tenure committee. 2012 -

XVI. UNIVERSITY COMMITTEES & OFFICES

2. Vice-Chairperson, Faculty Senate, 1979-1981.
4. Faculty Senate Council Representative from School of Medicine, 1979-1982.
7. Faculty Senate Committee on Committees, 1979-1981.
12. Search Committee for Vice-President for Research and Dean of the Graduate School, 1984-1985
15. Faculty Senate Committee for Rank, Salary and Conditions of Employment, 1987-1990 (Chair).
16. Faculty Senate Professional Conduct Committee, 1992 -1994 (Chair).
18. Faculty Senate Committee on Academic Services, 1997-1999.
19. Faculty Senate Committee on Women and Minorities, 2000-2004 (Chair).
22. Faculty Senate Ad Hoc Committee on Academic Freedom, 2008-2009.
23. Faculty Senate Ad Hoc Committee on Evaluation of Sub Deans, 2008-2011.

XVII. COMMUNITY ACTIVITIES

Health Crisis Network, Medical Advisory Committee, 1985

**XVII Licensure**

1984–Present  CLIA certified and licensed as a Clinical Laboratory Director in Florida And Diplomate, American Board of Bioanalysis
CURRICULUM VITAE
Gordon Broderick, Ph.D. P.Eng.
(updated December 8, 2016)

Current Appointment:  Professor, Dept. of Psychology and Neuroscience
College of Psychology, Nova Southeastern University,
Fort Lauderdale, FL, USA

Business Address: Institute for Neuro-immune Medicine,
Nova Southeastern University,
University Park Plaza, Suite 3440
3424 South University Drive
Fort Lauderdale, FL 33328
Ph. 780-492-1633   Fx. 780-407-6384
Email. gbroderick@nova.edu

Citizenship:  Canadian

Education and Training:
1980-1984  B.Eng. (Mechanical), McGill University, Montreal, Canada
1988-1989  M.Eng. (Chemical), McGill University, Montreal, Canada
1991-1994  Ph.D. (Chemical Eng.), École Polytechnique de Montréal,
Montreal, Canada
2000-2001  Post-doctoral fellow (Computer Science), McGill University,
Montreal, Canada
2002-2006  Post-doctoral research associate (Biochemistry), University of
Alberta, Edmonton, Canada

Licensure and Certification:
1986-present  Ing. (P. Eng.) Ordre des Ingénieurs du Québec (#39881)

Academic Appointments:
2000 – 2001  Visiting Scientist McGill School of Computer Science / Montreal
General Hospital, Montreal, Canada
2002 – 2006  Project Leader, Institute for Biomolecular Design, University of
Alberta, Edmonton, Canada
Centre, University of Alberta, Edmonton, Canada
2006 – 2013  Associate Professor with Tenure – Dept. of Medicine, Faculty of
Medicine and Dentistry, University of Alberta, Edmonton, Canada
2010 – Present  Associate Professor (Voluntary) – Dept. of Medicine, Miller
School of Medicine, University of Miami, USA
2013 – Present  Associate Professor (Voluntary) – Dept. of Medicine, Faculty of
Medicine and Dentistry, University of Alberta, Edmonton, Canada
Broderick, G.

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 – Present</td>
<td>Professor – Center for Psychological Studies, Nova Southeastern University, Fort Lauderdale, FL, USA.</td>
</tr>
<tr>
<td>2013 – Present</td>
<td>Professor – College of Pharmacy, Nova Southeastern University, Fort Lauderdale, FL, USA.</td>
</tr>
<tr>
<td>2013 – Present</td>
<td>Director – Clinical Systems Biology Group, Institute for Neuro-immune Medicine, Nova Southeastern University, Fort Lauderdale, FL, USA.</td>
</tr>
</tbody>
</table>

**Research Appointments:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989 - 1995</td>
<td>Research Engineer/Project Leader, Noranda Technology Center, Pointe-Claire, Canada</td>
</tr>
<tr>
<td>1995 – 1999</td>
<td>Senior Scientist, Noranda Technology Center, Pointe-Claire, Canada</td>
</tr>
<tr>
<td>1999 – 2002</td>
<td>Principal Scientist, Noranda Technology Center, Pointe-Claire, Canada</td>
</tr>
</tbody>
</table>

**Awards/Honours:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980 - 1984</td>
<td>J.B. Lynch Foundation Award (Bachelor)</td>
</tr>
<tr>
<td>1988 - 1993</td>
<td>R.M. Fowler Memorial Fellowship (Masters)</td>
</tr>
<tr>
<td>1988 - 1993</td>
<td>Natural Sciences and Engineering Research Council of Canada Award (Masters)</td>
</tr>
<tr>
<td>1991 - 1994</td>
<td>Natural Sciences and Engineering Research Council of Canada Award (Ph.D)</td>
</tr>
<tr>
<td>1992 - 1993</td>
<td>John S. Bates Centennial Fellowship (Ph.D)</td>
</tr>
<tr>
<td>2007-2008</td>
<td>Teacher of the Year Award (Small Group Case Study), University of Alberta Medical Students Association</td>
</tr>
<tr>
<td>2009-2010</td>
<td>Discovery Learning Preceptor Excellence Award, University of Alberta Medical Students Association</td>
</tr>
<tr>
<td>2010</td>
<td>Nightingale Award for Community Service, ME Society of Edmonton</td>
</tr>
<tr>
<td>2010-2011</td>
<td>Discovery Learning Preceptor Excellence Award, University of Alberta Medical Students Association</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Discovery Learning Preceptor Excellence Award, University of Alberta Medical Students Association</td>
</tr>
<tr>
<td>2012-2013</td>
<td>Discovery Learning Preceptor Excellence Award (Year 1), University of Alberta Medical Students Association</td>
</tr>
<tr>
<td>2012-2013</td>
<td>Discovery Learning Preceptor Excellence Award (Year 2), University of Alberta Medical Students Association</td>
</tr>
</tbody>
</table>

**Professional Memberships and Administrative Activities:**

**Memberships:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-present</td>
<td>Member, Ordre des Ingénieurs du Québec (#39881)</td>
</tr>
<tr>
<td>2010</td>
<td>Member, International Society for Interferon and Cytokine Research (#2634)</td>
</tr>
</tbody>
</table>
Grant Review:

2006  The Centre for Complexity Science, Jerusalem, Israel
2009  U.S.-Israel Bi-national Science Foundation, Jerusalem, Israel
2009  Chief Scientist Office of the Scottish Government Health Directorate, Edinburgh, UK (2 grant proposals)
2009  Microsoft Research PhD Scholarship Programme, Microsoft Research, Cambridge, UK (2 proposals)
2009  Canadian Institutes of Health Research (CIHR)
2009  Natural Sciences and Engineering Research Council of Canada (NSERC)
2010  NIH Chronic Fatigue Review Panel, Neurotoxicology and Alcohol (NAL) Study Section, National Institutes of Health, Bethesda, MD (2 proposals).
2010  Health Research Awards, the Health Research Board (HRB) of Ireland, Dublin, Ireland
2010  Chief Scientist Office of the Scottish Government Health Directorate, Edinburgh, UK
2011  NIH Chronic Fatigue Syndrome Special Emphasis Panel (SEP), National Institutes of Health, Bethesda, MD (4 proposals).
2011  Biomedical Innovation in Public-private Research Partnership program, French National Research Agency (ANR), National Institutes of Health, Bethesda, MD (4 proposals).
2011  RCUK Shared Services Centre for Medical Research Council of the UK (RCUK SSC) Award program, Swindon, Wiltshire, UK (2 proposals).
2011  CFIDS Association of America, Application for access to CFIDS Bio-bank. Charlotte, NC, US.
2012  NIH Chronic Fatigue Syndrome Special Emphasis Panel (SEP), National Institutes of Health, Bethesda, MD (4 proposals).

Review of candidates for faculty positions.

2006  Candidate Senior Lecturer; Dept. of Bio-medical Eng., Ben Gurion University, Israel
2008  Candidate Senior Lecturer; Faculty of Life Sciences; University of Bar-Ilan, Israel
2012  Promotion to full professor; Dr. Timothy Labron, Philosophy and religious Studies, Concordia University, Edmonton, AB, Canada
2013  Promotion to full professor; Dr. Mark Van Ness, Health, Exercise, and Sport Sciences Department, University of the Pacific, Stockton, CA

National and International Advisory Committees, Scientific Societies:

2010  Invited member; International Panel for Canadian Consensus Document on ME/CFS, Vancouver, Canada (*submitting author)
2010  Invited member; US Veteran’s Administration Cooperative Study Committee for Genome-wide Association in Gulf War Illness, Washington DC, USA (CSP #585)
2011 Invited panellist; US National Institutes of Health - Office of Research on Women’s Health (ORWH); State of the Knowledge on Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) Research, Washington DC, USA

2011-2016 Invited member; Scientific Advisory Board, Solve ME/CFS Initiative, Charlotte, USA


2014 Invited panellist; Strategic Advisory Board, Chronic Pain and Fatigue Network, Institute of Musculoskeletal Health and Arthritis (IMHA), Canadian Institutes of Health Research.

Editorial activities:

2012-2014 Member Editorial Board, *Brain Behavior and Immunity*, Elsevier, Amsterdam, NL (impact factor 5.061)

2011- Member Editorial Board, *Systems Biomedicine*, Landes Bioscience, Austin, TX (new journal, Editor-in-chief: Sol Efroni, PhD, Bar Ilan University, Israel)

2010- Associate Editor, *BMC Systems Biology*, Biomed Central, London, UK (impact factor 4.064)


Institutional Administrative and Leadership Contributions:

Organising committees


2009 Judge’s panel; Department of Medicine Research Day Graduate Student Poster Session (6 posters).

2015 Panel Member - Symposium: Optimizing Patient Outcomes: The Role of Psychology in Applying A Network Medicine Model. 2015 APA Annual Convention, Toronto, August, 2015

Administrative and Research Committees
Broderick, G.

2006-2007 Head Computational Biology and voting member, Scientific Management Executive Committee, Alberta Transplant Applied Genomics Centre
2007 Member, Faculty Committee for University Wireless Services
2007-2008 Member, Faculty Committee for Review of the Institute for Biomolecular Design
2007-2010 Member, Department of Medicine Research Committee
2006-2013 Member, Division of Pulmonary Medicine
2013- Founding member, Executive Committee, Institute for Neuro-immune Medicine, Nova Southeastern University

Student Examination committees

2011 MED526 PCC Human Sexuality II OSCE Examiner.

Graduate student academic committees.

2006-2009 Member, Ph.D. Committee – Mr. Zhipeng Cai, Dept. of Computer Science, University of Alberta
2006-2010 Member, Ph.D. Committee – Mr. Anmm Kamruzzaman, School of Public Health, University of Alberta
2011- Supervising Member, Ph.D. Committee – Mr. Saurabh Vashishtha, Dept. of Medicine, University of Alberta
2013-2014 Member, Ph.D. Examination Committee – Mr. Homood As Sobeai, College of Pharmacy, Nova Southeastern University

Teaching Contributions:

Postgraduate/graduate Advisees:

1995-1997 Mr. Trevor Fenton (M.Sc.)  
Graduate student “Finite element modeling of porous networks of composite materials”  
Funding: Noranda Technology Centre; NSERC  
My Role: Private sector co-supervisor; Primary supervisor: Dr. H. Budman (University of Waterloo)
1995-1997 Mr. Timothy Knapp (M.Sc.)  
Graduate student “Adaptive geometry neural network based control of chemical processes”  
Funding: Noranda Technology Centre; NSERC  
My Role: Private sector co-supervisor; Primary supervisor: Dr. H. Budman (University of Waterloo)
1996-1998 Mr. Jean Sébastien Bolduc (M.Sc.)  
Graduate student “Cellular-automata based nonlinear adaptive controllers”  
Funding: Noranda Technology Centre; NSERC  
My Role: Private sector co-supervisor; Primary supervisor: Dr. D. Thérien (McGill University)
1996-1998  Ms. Bodhana Ratitch (M.Sc.)
Graduate student “Continuous function identification with fuzzy cellular automata”
Funding: Noranda Technology Centre; NSERC
My Role: Private sector co-supervisor; Primary supervisor: Dr. D. Thérien (McGill University)

1997-2000  Mr. Brendan Cote (M.Sc.)
Graduate student “Applicability of advanced computational networks to the modeling of complex geometry”
Funding: Noranda Technology Centre
My Role: Private sector co-supervisor; Primary supervisor: Dr. D. Thérien (McGill University)

1997-2001  Ms. Paule Marceau (M.Sc.)
Graduate student “Modeling the impact of particle size distribution of mechanical properties of wood composites”
Funding: Noranda Technology Centre
My Role: Private sector co-supervisor; Primary supervisor: Dr. A. Cloutier (Université Laval)

2006-2007  Mr. Eric Carpenter (M.Sc.)
Research fellow “Bi-stability in repair from injury and rejection of kidney allografts”
Funding: University of Alberta, Start-up funding
My Role: Primary Supervisor

2007-2010  Dr. J Fuite (Ph.D. 2008)
Research fellow “Network Theoretical Study of Neuro-immune Deficiency in Chronic Fatigue and Gulf war Illness”
Funding: CFIDS Association of America
My Role: Primary Supervisor

2010-2011  Dr. Scott Meadows (Ph.D. 1994)
Research fellow “Integrated Control and Multi-stability of the Fight or Flight Axis”
Funding: U.S. Department of Defense
My Role: Primary Supervisor

2012-2013  Dr. T. Craddoek (Ph.D. 2011)
Research fellow “Integrated Control and Multi-stability of the Fight or Flight Axis”
Funding: U.S. Department of Defense
My Role: Primary Supervisor

2011-present  Mr. Saurabh Vashishtha (M.Sc., Ph.D. candidate)
Ph.D. Graduate student, “Immune Network Dynamics in Complex Stress-mediated Illness”
Funding: US National Institutes of Health
My Role: Primary Supervisor
2011-2014  
Mr. Sadiq Olavinka (M.Sc., M.Eng., Ph.D. candidate)  
Ph.D. Graduate student “The Network Dynamics of gene Regulation in Breast Cancer”  
Funding: NA  
My Role: Primary Supervisor

2013- present  
Ms Gaytri Patel (Psy.D. student, Clinical Psychology, Nova Southeastern University)  
Research intern “Gender-specific effects of neuroinflammation on human cognition ”  
Funding: US Dept. of Defense.  
My Role: Co-supervisor

2013- present  
Mr Trevor Barker (Psy.D. student, Clinical Psychology, Nova Southeastern University)  
Research intern “Gender-specific effects of neuroinflammation on human cognition ”  
Funding: US Dept. of Defense.  
My Role: Co-supervisor

2013- present  
Mr Tory Toole (Ph.D. student, Clinical Psychology, Nova Southeastern University)  
Research intern “Neuroinflammation and pain pathways "  
Funding: US Dept. of Defense.  
My Role: Co-supervisor

2013- present  
Ms Alexia Holovatyk (Ph.D. student, Clinical Psychology, Nova Southeastern University)  
Research intern “Chronic fatigue, neuroinflammation and their effects on human cognition "  
Funding: US Dept. of Defense.  
My Role: Co-supervisor

Undergraduate Advisees:

1995-1996  
Mr. Bernhard Handle (senior year metallurgical engineering design project)  
Undergraduate research assistant “Hydrometallurgical electro-refining of high-purity tellurium”  
Funding: Noranda Technology Centre, Principal  
My Role: Private sector co-supervisor; Primary supervisor Dr. P. Paschen, Montan-University, Leoben, Austria

2007  
Ms. Ann Aspler (M.Sc.) and Ms Carly Bolshin (B.Sc.) (M.D. students, class of 2010)  
Undergraduate research assistants “Evidence of Altered Neuroendocrine- immune Function in a Population-based Study of Chronic Fatigue Syndrome”
Funding: University of Alberta, start-up funds
My Role: Primary Supervisor

2008-2009
Mr. Michael Gallagher (M.D. student, class of 2010)
Undergraduate research assistant “Immune Biomarkers in Gulf War Syndrome”
Funding: CFIDS Association of America, U.S. Dept. of Defense
My Role: Primary Supervisor

2009
Ms. Andrea Kreitz (B.Sc., M.D. student, class of 2011)
Undergraduate research assistant “Emergent Patterns of Cytokine Expression in Chronic Fatigue Syndrome and Gulf War Illness”
Funding: CFIDS Association of America; Recipient of the PANDORA Summer Research Award
My Role: Primary Supervisor

2009
Ms. Christina Yang (M.Sc., M.D. student, class of 2011)
Undergraduate research assistant “A Study of Cognitive Deficits in Patients with Chronic Fatigue Syndrome”
Funding: CFIDS Association of America; Recipient of the Henry Anton Deutsch Medical Summer Research Award
My Role: Primary Supervisor

2010-2011
Mr. Scott De Graff (B.Sc., M.D. student, class of 2012)
Undergraduate research assistant “Models for Cardiovascular Dysregulation in Chronic Fatigue Syndrome”
Funding: CFIDS Association of America
My Role: Primary Supervisor

2011-2014
Ms. Jeanna Harvey (B.Sc., M.D. student, class of 2014, University of Miami)
Undergraduate research assistant “Exercise Induced Immune Gene Expression in Gulf War Illness”
Funding: US Veterans Affairs
My Role: Co-supervisor

2012
Ms. AnneLiese Smylie (B.Sc. Honours, M.D. student, class of 2015)
Undergraduate research assistant “A Cytokine-based Screening Test for Gulf War Illness”
Funding: Alberta Innovates Health Solutions (AIHS); Recipient of an AIHS Summer Studentship Research Award
My Role: Primary Supervisor

2012
Mr. Henrique Fernandes (B.Eng. Distinction, M.D. student, class of 2015)
Undergraduate research assistant “Identifying Common Molecular Traits and Emergent Patient Sub-groups in Chronic Fatigue Syndrome”
Funding: Canadian Institutes for Health Research (CIHR); Recipient of a CIHR Health Professional Student Research Award.
My Role: Primary Supervisor

2013  Mr. Lundy McKibbin (B.Sc. Distinction, M.D. student, class of 2016)
Undergraduate research assistant “A study of the effects of PTSD co-morbidity on immune signature in Gulf War Illness”
Funding: US. Dept. of Defense.
My Role: Primary Supervisor

2013  Mr. Simar Singh (M.Sc. Distinction, Stanford University)
Graduate research assistant “A study of neuro-inflammatory mechanisms in Gulf War Illness”
Funding: US. Dept. of Defense.
My Role: Primary Supervisor

2013  Ms. Alanna Bowie (B.Sc. Distinction, M.D. student, class of 2016)
Undergraduate research assistant “Prognostic Clinical Markers for Early Detection Chronic Sequela from Infectious Mononucleosis”
Funding: Alberta Innovates Health Solutions (AIHS); Recipient of an AIHS Summer Studentship Research Award.
My Role: Primary Supervisor

2013  Ms. Melissa Hwang (B.Sc. Distinction, M.D. student, class of 2016)
Undergraduate research assistant “Mechanisms of Immune-endocrine Interaction in Episodic Exacerbation of Chronic Fatigue Syndrome”
Funding: Faculty of Medicine and Dentistry; Recipient of the David and Beatrice Reidford Research Scholarship.
My Role: Primary Supervisor

2013-2014  Mr. Mark Rice (Computer Science student, class of 2014)
Undergraduate research assistant “Large-scale Circuit Models of Physiological Regulation”
Funding: US Dept. of Defense
My Role: Primary Supervisor

2013-2014  Mr. Ryan del Rosario (Computer Science student, class of 2014)
Undergraduate research assistant “Large-scale Circuit Models of Physiological Regulation”
Funding: US Dept. of Defense
My Role: Primary Supervisor

2013-2014  Mr. Patrick Gourdet (Computer Science student, class of 2014)
Undergraduate research assistant “Large-scale Circuit Models of Physiological Regulation”
Funding: US Dept. of Defense
My Role: Primary Supervisor

2013
Ms. Lindsey Russell (B.Sc. Honours (cell biology), M.D. student, class of 2016)
Undergraduate research assistant “Gulf War Illness; a comprehensive model incorporating insults to cardiac, neurological and immune function”
Funding: Alberta Innovates Health Solutions (AIHS); Recipient of an AIHS Summer Studentship Research Award.
My Role: Primary Supervisor

2013-2014
Mr Samuel Thomas (B.Sc. student, Behavioral Neuroscience, class of 2015, Nova Southeastern University)
Research intern “Neuroinflammatory cascades in the brain”
Funding: US Dept. of Defense.
My Role: Co-supervisor

2014
Mr Shane Hills (B.Sc. Physics, Queen’s University 2012)
Research intern “Mapping Neurological Response to Exercise Challenge in Gulf War Illness”
Funding: CFIDS Association of America/ Univ. of Wisconsin.
My Role: Supervisor

Classroom Instruction (undergraduate):

2007
DMED 512 - Infection, Immunity and Inflammation, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 9.2/10.0

DMED 514 – Cardiovascular, Pulmonary and Renal Systems, Small Group Facilitator, University of Alberta, Edmonton, AB:
Renal Block; Overall effectiveness rating 9.4/10.0
Pulmonary Block; Overall effectiveness rating 10.0/10.0

2008
MED516 /DDS510 Patient-centred Care I, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: Not transmitted

MED526 /DDS520 Patient-centred Care II, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: Not transmitted

MED521 /DDS506 – Gastroenterology and Nutrition, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 9.8/10.0

DMED 514 – Cardiovascular, Pulmonary and Renal Systems, Small Group Facilitator, University of Alberta, Edmonton, AB:
Renal Block; Overall effectiveness rating 9.4/10.0
Broderick, G.

Pulmonary Block; Overall effectiveness rating 9.1/10.0
Cardiology Block; Overall effectiveness rating 9.4/10.0.

Substitute Teaching as Discovery Learning (DL) small group facilitator in:
DMED 512 - Infection, Immunity and Inflammation
DMED 513 – Endocrinology and Metabolism

2009

DMED 512 - Infection, Immunity and Inflammation, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 9.4/10.0

MED522 Reproductive Medicine and Urology, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 10.0/10.0

MED526/DDS520 Patient-centred Care, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: Not transmitted

DMED 514 – MED524 Neurosciences and Organs of Special Senses (A), Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 10.0/10.0

DMED 514 – MED524 Neurosciences and Organs of Special Senses (B), Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: Not transmitted

MED515 Community Health, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 9.8/10.0

MED526/DDS520 Patient-centred Care II, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 8.0/10.0

2010

DMED 512 - Infection, Immunity and Inflammation, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 10.0/10.0

MED522 Reproductive Medicine and Urology, Small Group Facilitator, University of Alberta, Edmonton, AB
Overall effectiveness rating: 9.8/10.0

MED526 Patient-centred Care, Small Group Facilitator, University of Alberta, Edmonton, AB (**) 2 groups in parallel
Overall effectiveness rating: 10.0/10.0
DMED 514 – Cardiovascular, Pulmonary and Renal Systems (Cardiovascular block), Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 9.8/10.0

MED524 Neurosciences and Organs of Special Senses (A), Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 9.4/10.0

MED526/DDS520 Patient-centred Care, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: (no score provided)

2011
DMED 512 - Infection, Immunity and Inflammation, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 10.0/10.0

MED522 Reproductive Medicine and Urology, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 10.0/10.0

MED526 Patient-centred Care, Small Group Facilitator, University of Alberta, Edmonton, AB (** 2 groups in parallel)  
Overall effectiveness rating: 10.0/10.0

2012
DMED 512 - Infection, Immunity and Inflammation, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 10.0/10.0

MED522 Reproductive Medicine and Urology, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: 9.89/10.0

MED516 Patient-centred Care, Small Group Facilitator, University of Alberta, Edmonton, AB  
(2 sessions: Medical Ethics, Patient Advocacy)  
Overall effectiveness rating: Ongoing

MED 523/DDS 523 - Musculoskeletal System, Small Group Facilitator, University of Alberta, Edmonton, AB  
Overall effectiveness rating: Ongoing

Classroom Instruction (graduate):

1995
MTH 6301 Statistical Design and Analysis of Experiments  

2013
MED 573 An Introduction to Clinical Systems Biology  
Dept. of Medicine, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada.
**Research Grants:**

Currently Active Grants:

<table>
<thead>
<tr>
<th>Date</th>
<th>Funding Body</th>
<th>Title</th>
<th>Role</th>
<th>Total Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/2013-01/2017</td>
<td>U.S. Department of Defense</td>
<td>“GW120045 - Understanding Gulf War Illness: An Integrative Modeling Approach.”</td>
<td>Co-PI. - Director Computational Core</td>
<td>CAN$: 1,200,000 sub-award ($4,764,000 USD)</td>
</tr>
<tr>
<td>04/2014-03/2018</td>
<td>U.S. Department of Veterans Affairs</td>
<td>“VA/CSR&amp;D Award for Research on GWI - Women vs. Men with GWI: Differences in Computational Models and Therapeutic Target.”</td>
<td>Co-PI. - Director Computational Core</td>
<td>CAN$: 2,200,000 ($2,000,000 USD)</td>
</tr>
<tr>
<td>04/2014-04/2016</td>
<td>Nova Southeastern University President’s Award</td>
<td>“Investigating the mTBI neuroinflammatory response to develop novel diagnostics”</td>
<td>Co-Inv.</td>
<td>$10,000 USD</td>
</tr>
<tr>
<td>06/2014-03/2017</td>
<td>U.S. Department of Defense</td>
<td>“GW130053 - Epigenetic Mediation of Endocrine and Immune Response in an Animal Model of Gulf War Illness”</td>
<td>Co-PI. - Director Computational Core</td>
<td>$140,000 USD sub-award</td>
</tr>
<tr>
<td>08/2014-07/2018</td>
<td>U.S. National Institutes of Health (NIH)</td>
<td>“Gender Differences in ME/CFS (R01)”</td>
<td>Co-PI - Director Computational Core</td>
<td>CAN$: 2,300,000 USD</td>
</tr>
<tr>
<td>10/2014-09/2018</td>
<td>U.S. Department of Veterans Affairs</td>
<td>“VA/CSR&amp;D Award for Research on GWI - A Translational Medicine Approach to Gulf War Illness: From Cells to Therapy.”</td>
<td>Co-PI. - Director Computational Core</td>
<td>CAN$: 2,200,000 ($2,000,000 USD)</td>
</tr>
<tr>
<td>7/2015-06/2018</td>
<td>U.S. Department of Defense</td>
<td>“GW140142 - High Fidelity Design of Multi-modal Restorative Interventions in Gulf War Illness”</td>
<td>PI.</td>
<td>$810,000 USD</td>
</tr>
</tbody>
</table>
7/2015-06/2018 U.S. Department of Defense
Title: “GW140153P1 - Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Therapeutics: Liposomal Glutathione and Curcumin”
Role: Co-Inv.
Total Budget: $1,073,000 USD

Title: “GW - Improving Diagnostics and Treatments for GWI Females by Accounting for the Effects of PTSD”
Role: Co-Inv.
Total Budget: $658,000 USD

Title: “GW140153P1 - Disentangling the Effects of PTSD from GWI for Improved Diagnostics and Treatments”
Role: Co-Inv.
Total Budget: $594,000 USD

Completed Grants:

07/2006-06/2009 University of Alberta, Faculty of Medicine and Dentistry (Start-up Grant N031000099)
Title: “Mechanistic analysis of microarray signatures in transplant rejection”
Role: Principal Investigator
Total Budget: CAN$: 60,000

07/2006-12/2007 Genome Canada
Title: “Transplant Transcriptome Project”
Role: Co-investigator
Total Budget: CAN$: 90,000

01/2008-01/2010 U.S. National Institutes of Health (NIH)
Title: “A Prospective Study of CFS in Adolescents”
Role: Consultant
Total Budget: CAN$: 5,000 consultancy ($5,000 USD)

03/2009-02/2011 CFIDS Association of America
Title: “Molecular Patterns of Persistent Immune Activation in a Post-infectious Adolescent Cohort”
Role: Principal Investigator
Total Budget: CAN$: 156,000 sub-award ($125,000 USD)

06/2009-08/2009 University of Alberta, Faculty of Medicine and Dentistry
Henry Anton Deutsch Medical Summer Research Award in support of summer studentships for Ms. Christina Yang
Role: Principal Investigator
Total Budget: CAN$: 2,400
07/2009-06/2012*  U.S. Department of Defense
Title: “The Use of Comprehensive Molecular Profiling with Network and Control Theory to Better Understand GWI and Model Therapeutic Strategies”
Role: Co-PI
Total Budget: CAN$: 164,000 sub-award ($130,000 USD)
* Extended 1 year wo additional funding

05/2009-04/2014  Alberta Heritage Foundation for Medical Research
Title: “Etiology of Inflammatory Bowel Disease: Gene, Microbe, and Environment Interactions”
Role: Co-investigator
Total Budget: CAN$: 200,000 sub-award (1.0 FTE Research Associate)

05/2009-04/2013  Patient Alliance for Neuroendocrine-immune Disorders Organization for Research and Advocacy (PANDORA) Research Award in Support of summer studentships in Broderick laboratory
Title: “Biomarkers for Gulf War Illness”
Role: Principal Investigator/ Program Director
Total Budget: CAN$: 3,500 USD

07/2011-06/2012  U.S. Department of Defense
Title: “Gulf War Illness Research Program Consortium Development Award”
Role: Co-Inv. - Director Computational Core
Total Budget: CAN$: 15,000 ($262,700USD total travel award)

09/2010-08/2013  U.S. Department of Defense
Title: “Theory-driven Models for Correcting “Fight or Flight” Imbalance in Gulf War Illness.”
Role: Principal Investigator
Total Budget: CAN$: 701,000 ($679,000 USD)

10/2010-09/2014  U.S. National Institutes of Health (NIH)
Title: “Study of Chronic Fatigue Syndrome using comprehensive molecular profiling with network and control theory (R01)”
Role: Co-PI
Total Budget: CAN$: 398,000 sub-award ($386,000 USD)

06/2012-07/2013  CFIDS Association of America
Title: “Post-exertion malaise in CFS: A systems biology approach to understanding brain, inflammation and behavior interactions”
Role: Co-Investigator
Total Budget: CAN$: 20,000 sub-award ($20,000 USD)

08/2012-07/2014  U.S. National Institutes of Health (NIH)
Title: “Microbial Translocation in Chronic Fatigue Syndrome (R21)”
Role: Co-PI
Total Budget: CAN$: 100,000 sub-award ($362,000 USD)

Publications:

Peer-Reviewed Original Research (trainees directly supervised by me are underlined):


**Life science works**


Broderick, G.


Invited Reviews and Editorials:


Book Chapters:


Abstracts/ Proceedings:

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.


Life science works


Presented: Poster Presentation

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Poster Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Oral Podium Presentation.

Presented: Poster Presentation.

Broderick, G.

Presented: Poster Presentation.


Presented: Oral Podium Presentation.


Presented: Poster Presentation.


Presented: Poster Presentation.

Toole JT, Craddock TJA, Rice, MA Jr., Broderick G, Klimas NG, Fletcher MA, Morris M. Exploring the Role of Homeostatic Drive in the Perpetuation of Depression and Anxiety Disorders. Anxiety and Depression Conference 2015, Miami, Florida, April 9-12, 2015

Presented: Poster Presentation.


Presented: Poster Presentation.


Presented: Poster Presentation.

Toole JT, Craddock TJA, Rice, MA Jr., Broderick G, Klimas NG, Fletcher MA, Morris M. Homeostatic Drive and the Perpetuation of Depression and Anxiety. 2015 American Psychological Association Conference, Session 1179: Behavioral Neuroscience and Comparative Psychology, Toronto, Ontario, Canada, August 6-9, 2015. Poster A-8

Presented: Poster Presentation.


Presented: Poster Presentation.

Broderick G, Toole JT. Recent Findings in Network Medicine: Implications for Psychology. 2015 American Psychological Association Conference, Session on Optimizing Patient Outcome - The
Role of Psychology in Applying A Network Medicine Model, Toronto, Ontario, Canada, August 6-9, 2015.
Presented: Oral Podium Presentation.


Presented: Poster Presentation

Presented: Poster Presentation

Presented: Poster Presentation.

Presented: Poster Presentation

Presented: Oral Podium Presentation


**Invited International Scientific Presentations.**


Broderick, G. Shifting Immune Conversations: A Systems Biology Approach to Gulf War Illness and CFS/ME. US Veterans Affairs, Miami Veterans Affairs Medical Center, Miami, FL, March 26, 2011.


Barnes Z, Fletcher, MA, Broderick G, Klimas NG. The Use of Multiplex Cytokine Analysis in Complex Multisystem Disorders. Invited speaker, Closed meeting, Quansys Biosciences, Logan, Utah, March 10, 2013.

Klimas NG, Fletcher MA, Broderick G. A Translational Medicine Approach to ME/CFS Using Computational Modeling for Selecting Subgroups and Therapeutic Targets: A P01 Outline. Reverse site visit to Dr. Timothy A. Gondré-Lewis, Ph.D., Program Officer/COR Immunoregulation Section, Basic Immunology Branch Division of Allergy, Immunology, and Transplantation. US National Institute of Allergy and Infectious Diseases (NIAID), Bethesda, MD, Feb. 13, 2013


Broderick G., Klimas NG: Briefing on research in translation medicine on Gulf War Illness to the staff of Senator Bernard "Bernie" Sanders from Vermont, Washington, DC, January 8, 2014.


**Invited National/Regional/Local Presentations**


Broderick G. Discovery Learning: A Preceptor’s Impressions. Academic Half-day, Geriatric Division, Glenrose Rehabilitation Hospital, Edmonton, AB, June 16, 2009.


Broderick G. Simulating the systems biology of immune therapy. Guest faculty seminar, Department of Cell and Systems Biology, University of Toronto Scarborough, Scarborough, ON, April 30, 2015.

Patents.


Media Coverage.


Press release announcing award of CFIDS Association grant to PI Broderick for the study of post-infectious fatigue. Picked up by 75 news outlets including Reuters, AOL Money News, Forbes, the Los Angeles Times and Houston Chronicle among others. December 3, 2008.

Interview with Mr. Kirk Fernandes, Medical Unit Producer, The Dr. Oz Show, as part of background research for segment on XMRV and viral triggers of chronic fatigue syndrome. November 2, 2009. (Aired December 3, 2009).

Interviewed and quoted by Zdeb C, Waking up to the reality of chronic fatigue. Describing his new study of EBV-induced metabolic and immune dysfunction. Canwest News Service, Published: Saturday, April 18, 2009 in Edmonton Journal and affiliated CanWest newspapers.

Correspondence regarding research into post-infectious fatigue with Diane R. Bean, Senior Coordinator, International Programs Division, Office of Policy and Public Affairs, Bureau of Consular Affairs, U.S. Department of State. February 5, 2009.

Interviewed live on the air as invited guest on Peter Brown show RadioActive CBC Radio, regarding his new US award to study of post-infectious fatigue syndrome, CBC Studios, Edmonton, January 8, 2009.


Interview with Rob Wijbenga, Chair to the ME/cvs Vereniging, Netherlands. ME/CFS outreach project “Science to Patients”, subsidized by the Dutch Ministry of Health, October TBD, 2014, regarding the new Institute for Neuro-immune Medicine and the Clinical Systems Biology group in energizing discovery in chronic fatigue research.


Broderick lab featured at eMerge Americas, an innovation event connecting revolutionary startups, cutting-edge ideas, and global industry leaders & investors across North America, Europe, and Latin America. “Complex Illness and the Human Computer “, May 1-5, 2015.