
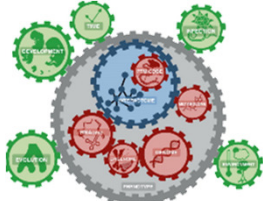

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Computational Analysis Plan for CFS Study



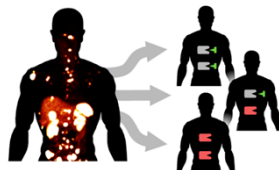
Omics Data Processing Pipelines



Integrative Visualization System




Big Data Analytics & Knowledge Discovery



Disease Driven Applications

Research Plan for the Big Data Study of CFS

1


23-Apr-16


ME/CFS Severely Ill-BIG DATA Study: Research Data

- RNA Gene Expression - PBMCs
- RNA Gene Expression - NKs
- RNA Gene Expression - Monocytes
- RNA Gene Expression - T-Cells
- RNA Gene Expression - B-Cells
- RNA Gene Expression - Macrophages
- RNA Gene Expression - Dendritic Cells
- MicroRNA in Plasma
- Proteomics
- Cell-Free DNA
- Whole Genome Sequencing
- Whole Exome Genome Sequencing
- Mitochondrial Genome Sequencing
- Mitochondrial DNA/Nuclear DNA Ratio
- HLA DNA Sequencing
- WBC density


- Autoantibody panel
- T-cell Repertoire DNA Sequencing-Stanford
- T-cell Repertoire DNA Sequencing-Sequentia
- CyTOF Standard Panel
- CyTOF Additional Panels
- Pan Viral Panel
- Serum Cytokines
- Ceres Nano Lyme
- Microbiome - stool
- Metabolomics - stool
- Metabolomics - plasma
- Metabolomics - urine
- Heavy Metals - blood
- Heavy Metals - urine
- Mycotoxins by Magarray

Research Plan for the Big Data Study of CFS

2



ME/CFS Severely Ill-BIG DATA Study: Clinical Tests




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<ul style="list-style-type: none"> Acylcarnitines Ammonia Bartonella extended cx Biotin (Vitamin B7) CBC (Complete Blood Count) Chemistry Comprehensive Panel Creatine Kinase Copper C- Reactive Protein Cysteine Folate FSH (Follicle-Stimulating Hormone) LH (Luteinizing Hormone) Estrogen HbA1C (Hemoglobin A1c) Homocysteine IgG Subsets Lactate Lyme Serology with reflex Western Blot Lymphocyte Subsets MMA (Methylmalonic Acid) 	<ul style="list-style-type: none"> MTHFR Mutations (Methylenetetrahydrofolate) Natural Killer Cell (Count & Function) Organic Acids - urine Pyruvate Serotonin Testosterone Thyroid Panel Uric Acid Vasopressin/ADH Viral Digital PCR Viral Serologies: <ul style="list-style-type: none"> EBV EA (Epstein Barr Virus EA) EBV NA (Epstein Barr Virus NA) EBV VCA (Epstein Barr Virus VCA) CMV (Cytomegalovirus) HHV-6 (Human Herpesvirus 6) Parvovirus HHV-7 (Human Herpes Virus 7) HSV1&2 (Herpes Simplex 1 & 2) Vitamin B12 (Cobalamin) Vitamin D25 OH
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Research Plan for the Big Data Study of CFS

3




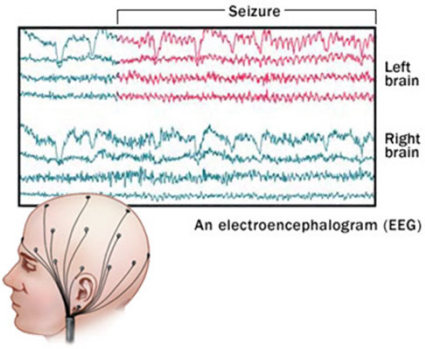
ME/CFS Severely Ill-BIG DATA Study: Other Tests



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- Extended EEG
- Sleep monitoring
- Fitbit
- Cognitive Testing
- Questionnaires - SF36, PROMIS

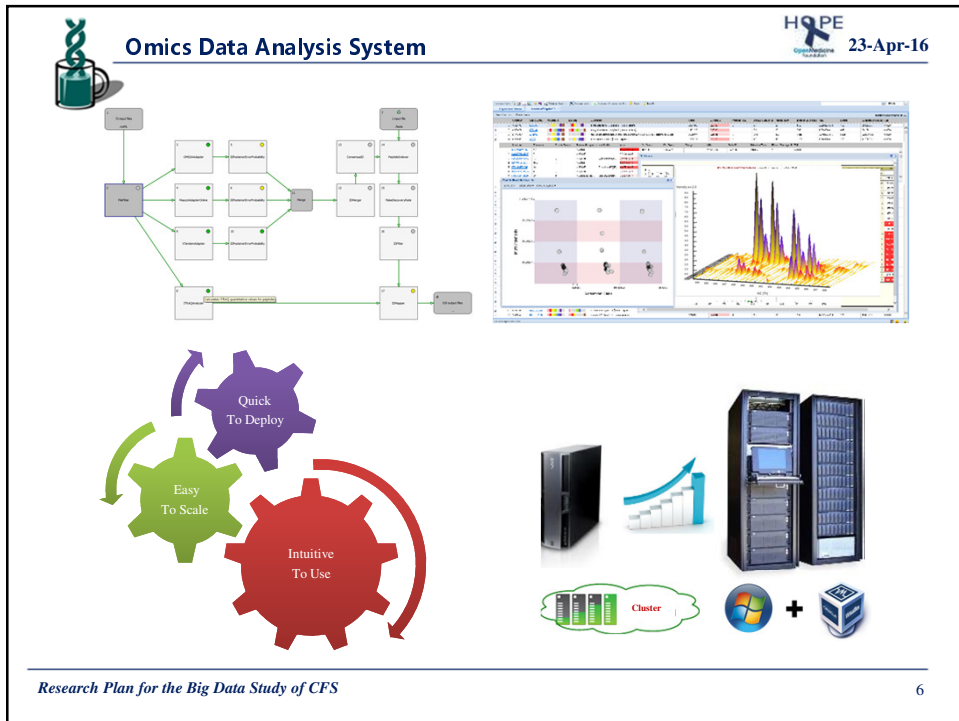
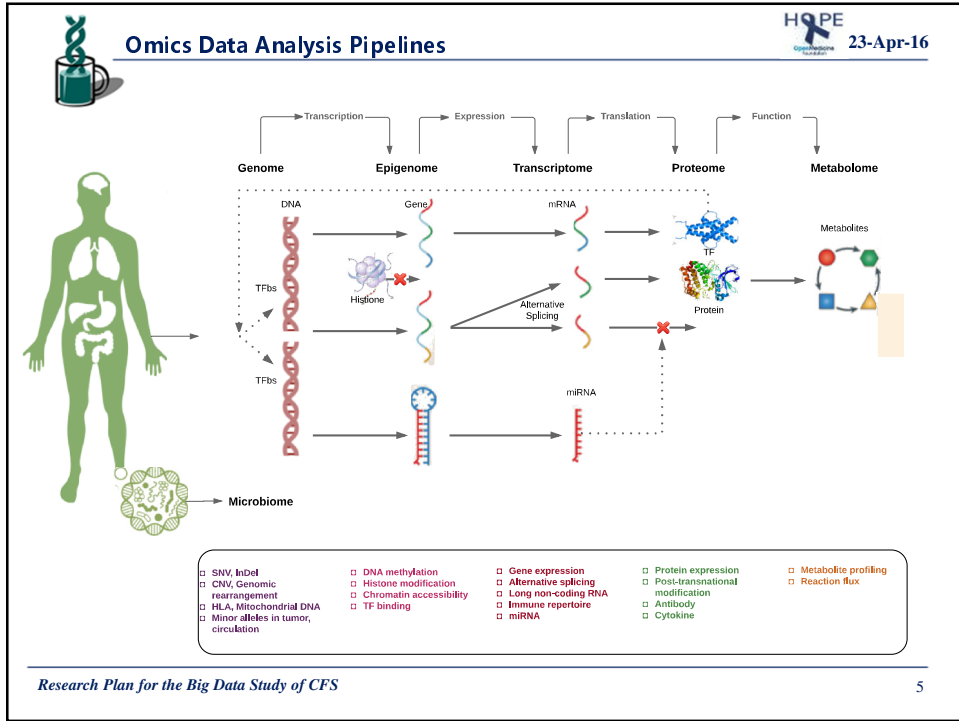


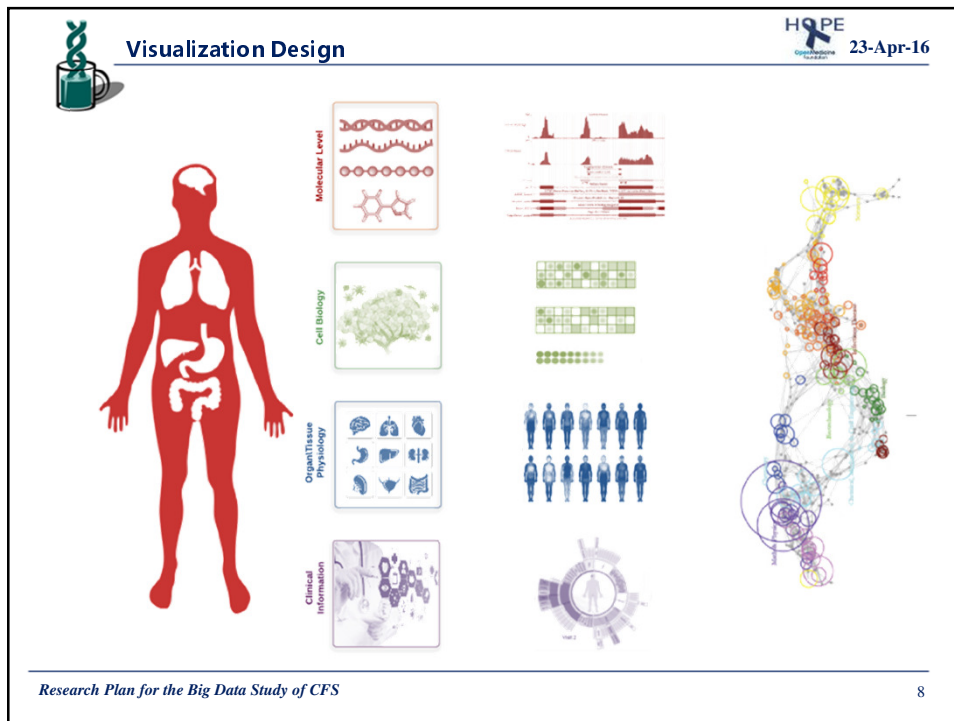
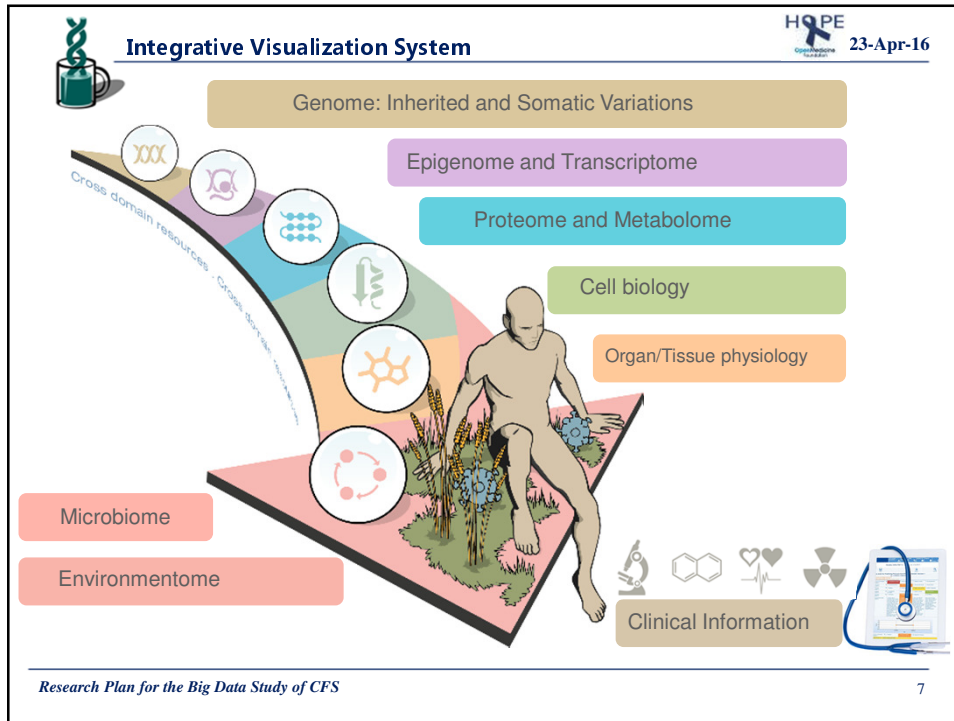


An electroencephalogram (EEG)

Research Plan for the Big Data Study of CFS

4





Visualization Design HOPE 23-Apr-16

Research Plan for the Big Data Study of CFS 9

Big Data Analytics and Knowledge Discovery HOPE 23-Apr-16

Research Plan for the Big Data Study of CFS 10

