

The tale of three pandemics

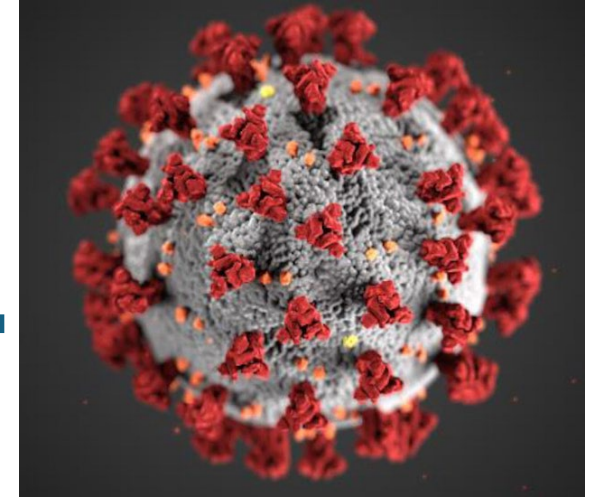


HIV/AIDS Pandemic
1980



Ebola Pandemic
2016

NIH Intramural Post-Infection ME/CFS Study



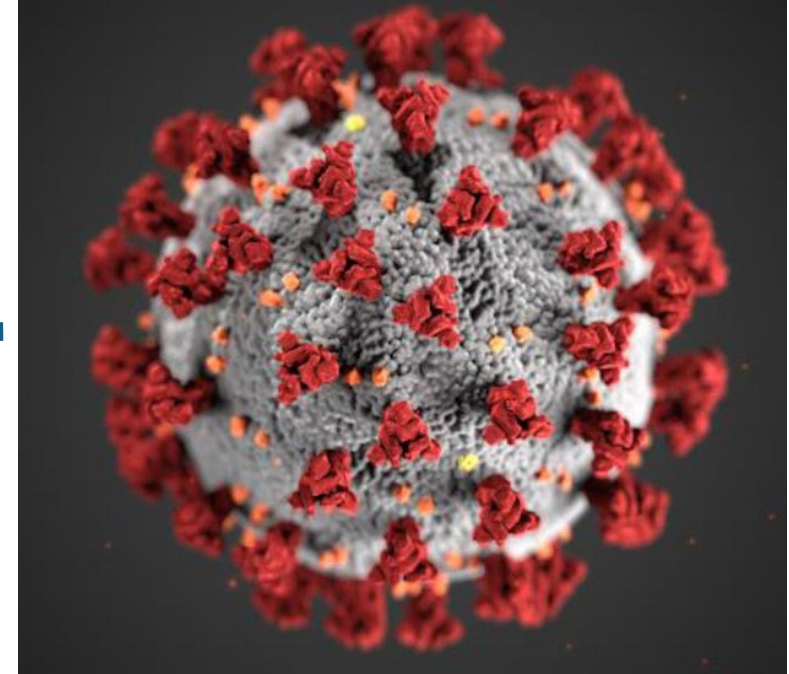
SARS CoV-2 Pandemic
2020



Ebola Pandemic
2016

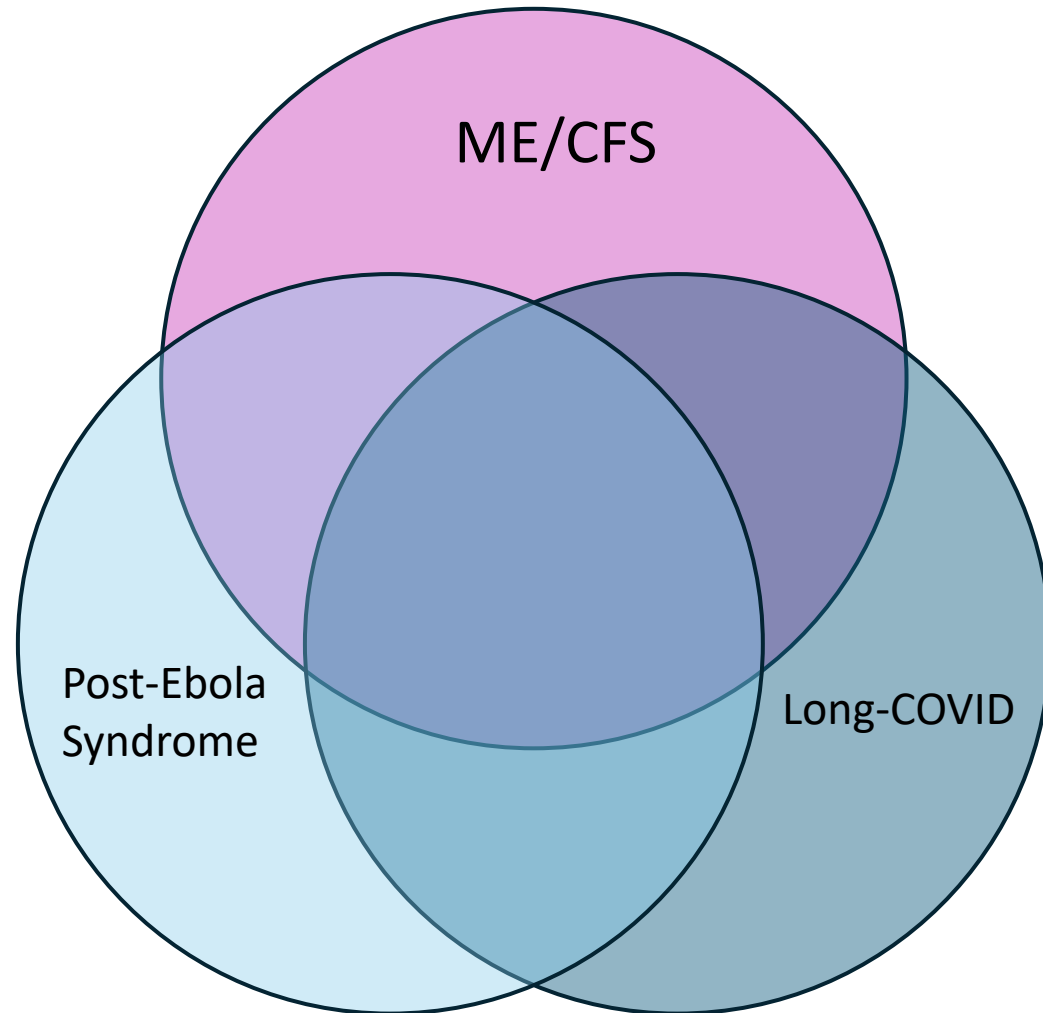
Post-Ebola Syndrome

NIH Intramural
Post-Infection ME/CFS
Study



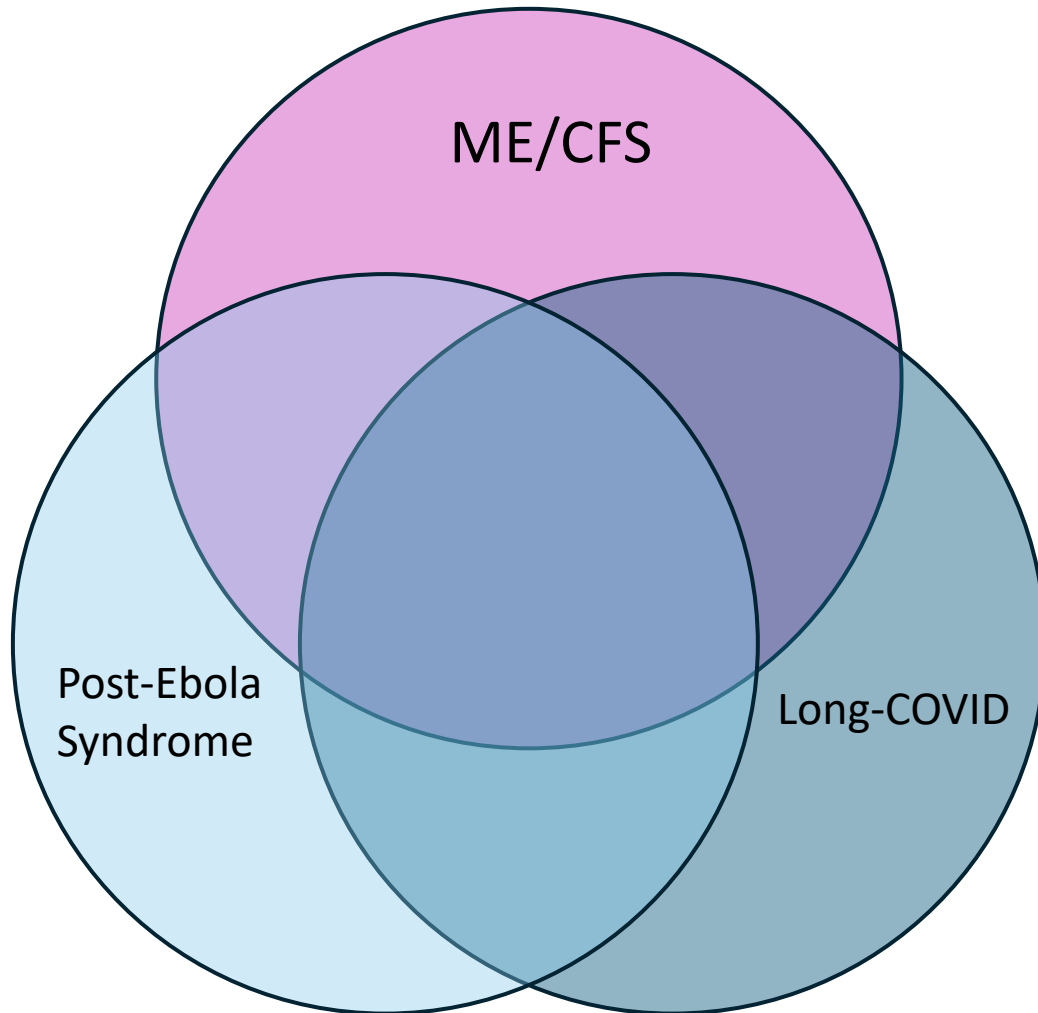
SARS CoV-2 Pandemic
2020

Long-COVID



Post Acute Infection Syndromes

HIV/AIDS
Persistent infection
Viral reservoirs
No ME/CFS like symptoms



Post Acute Infection Syndromes

Gastrointestinal or Respiratory

ME/CFS

Post-Ebola
Syndrome

Long-COVID

Gastrointestinal

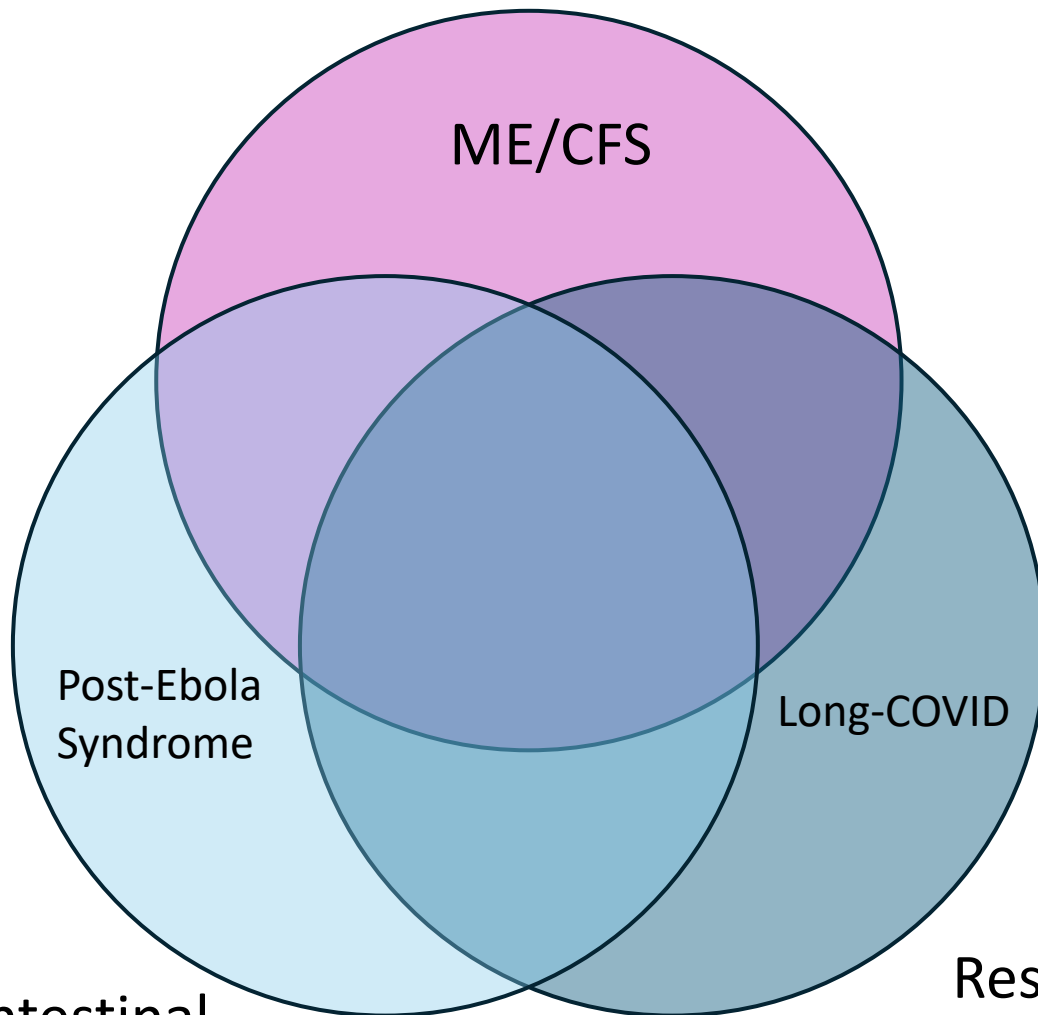
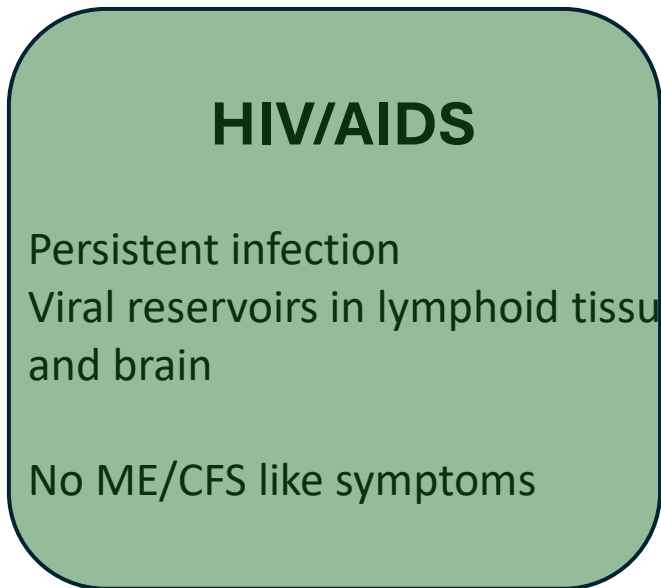
Respiratory

Post Acute Infection Syndromes

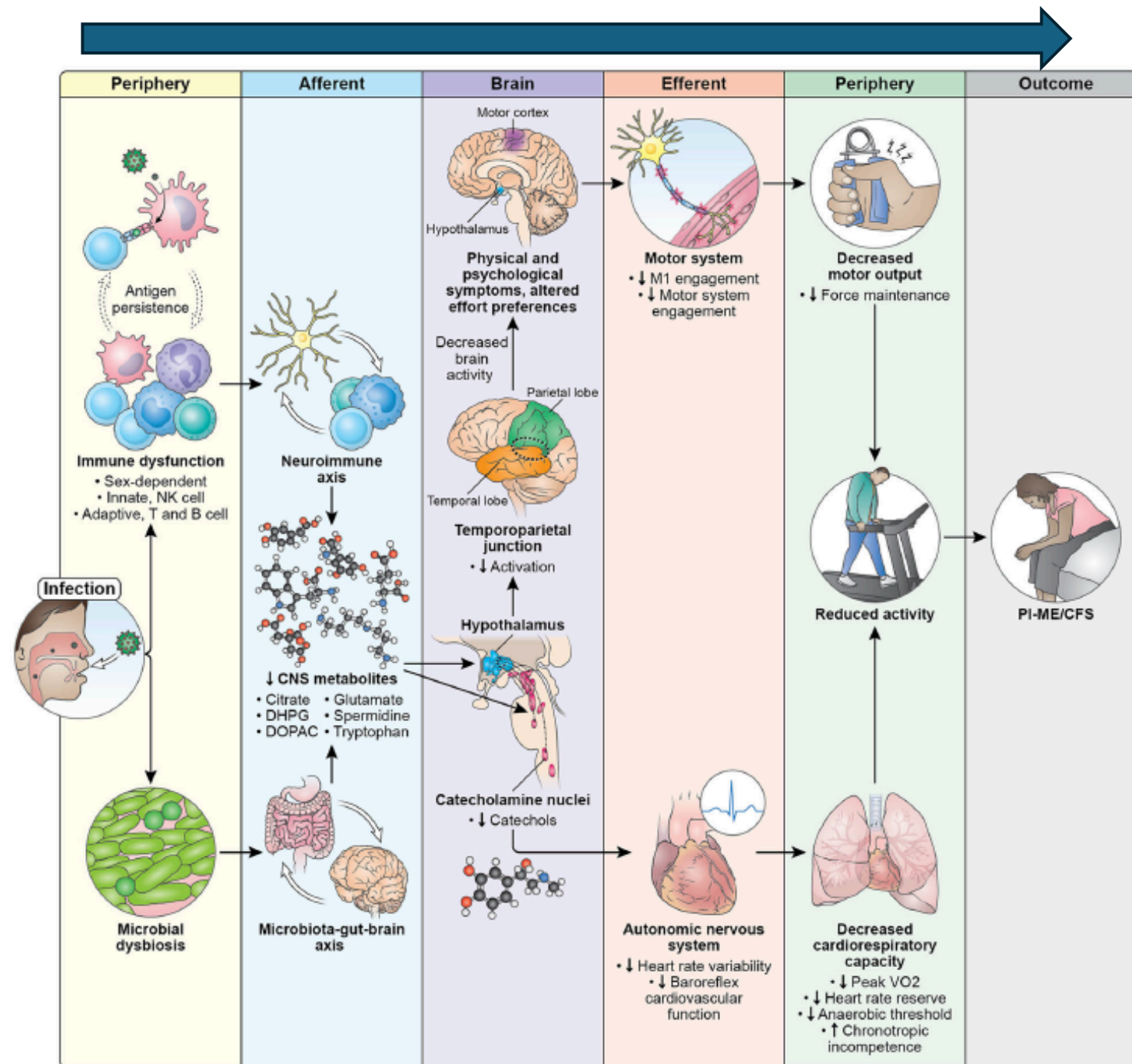
HIV/AIDS

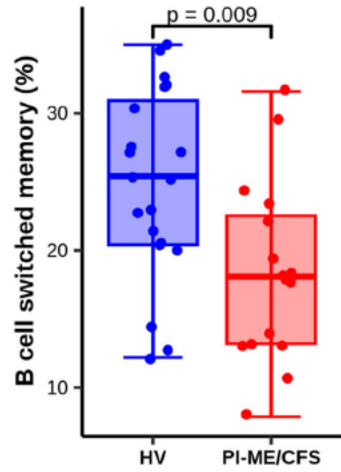
Persistent infection
Viral reservoirs in lymphoid tissues
and brain

No ME/CFS like symptoms



Proposed Pathophysiology of ME/CFS





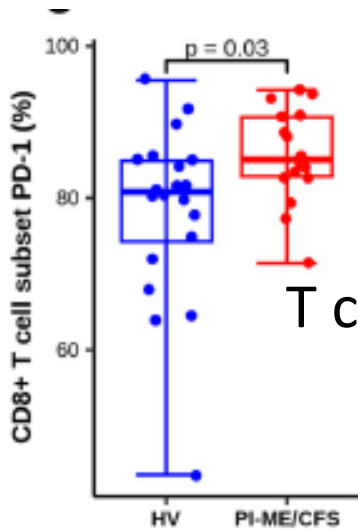
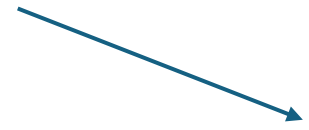
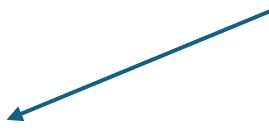
Decreased ability to switch B cells from IgM to IgG



Poor immune response against a microbial antigen



Persistence of microbial antigen



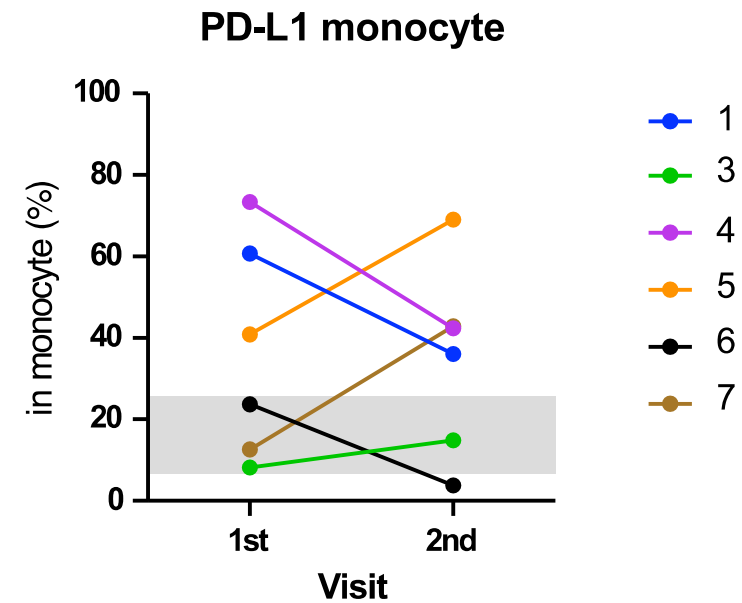
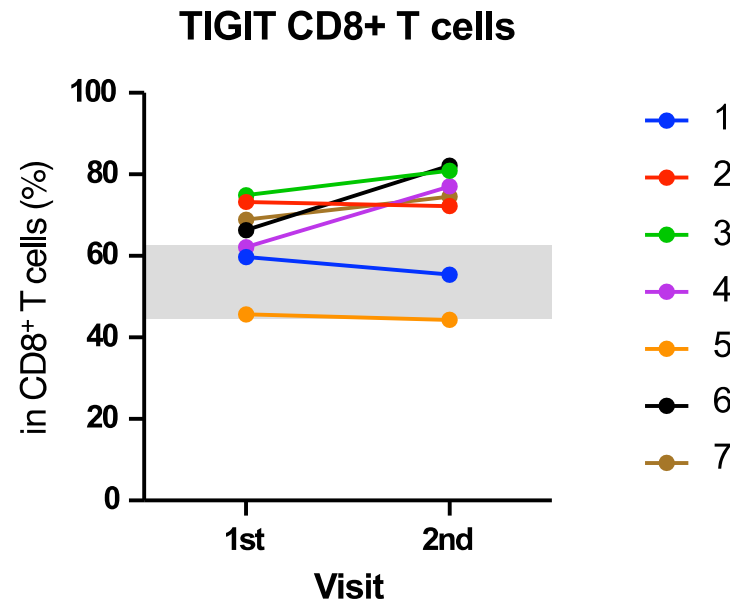
T cell exhaustion

Innate immune activation



Immune Exhaustion in Long-COVID

Persistent immune exhaustion at one year



Suggest Next Steps

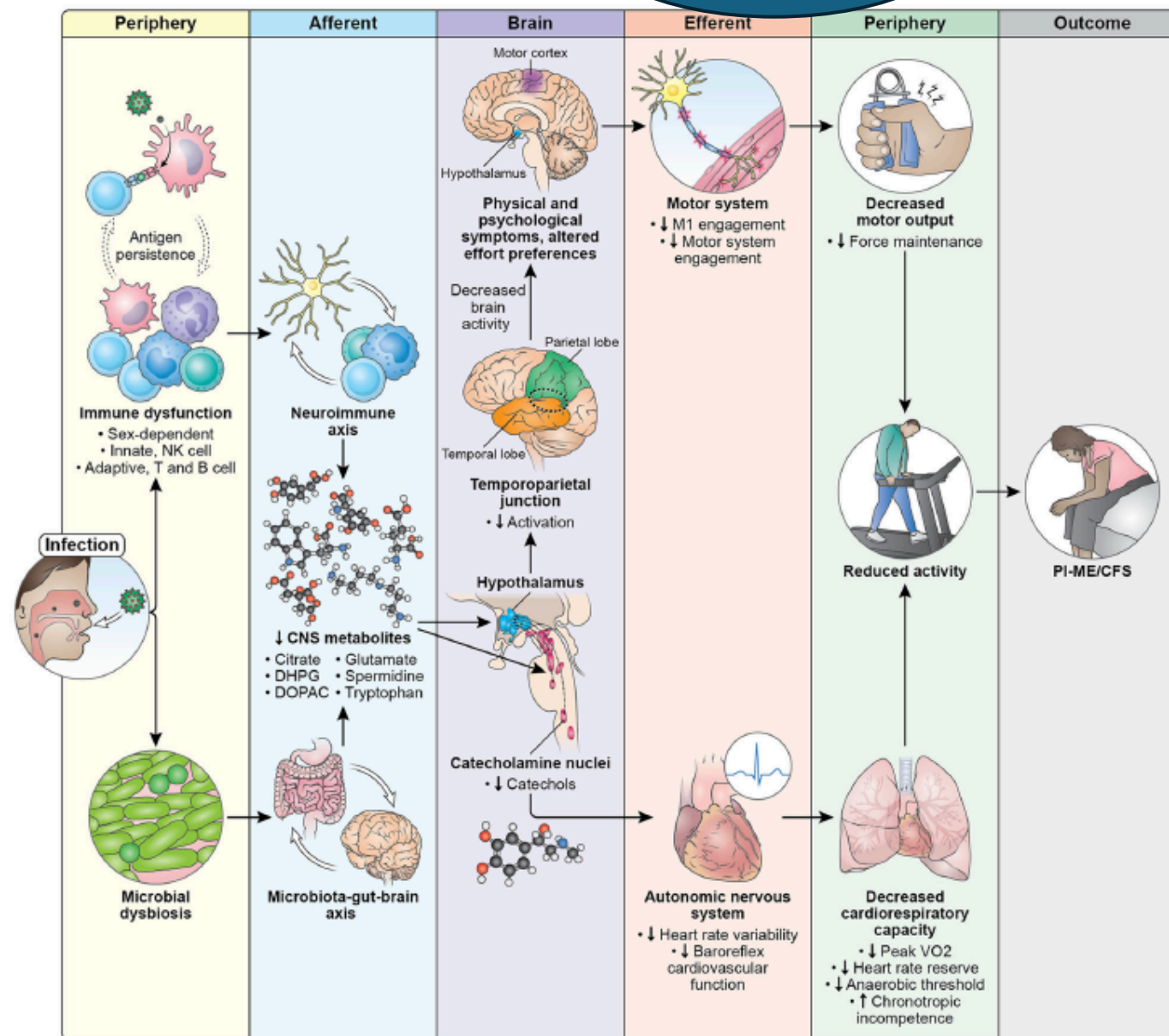
- Continue analysis and publication of data/samples collected
- Reanalysis of data by other researchers
- Validation in other cohorts
- Discuss and develop plans for clinical trials
- Study pathophysiology in the context of clinical trials

Proposed Pathophysiology of ME/CFS

Reactionary



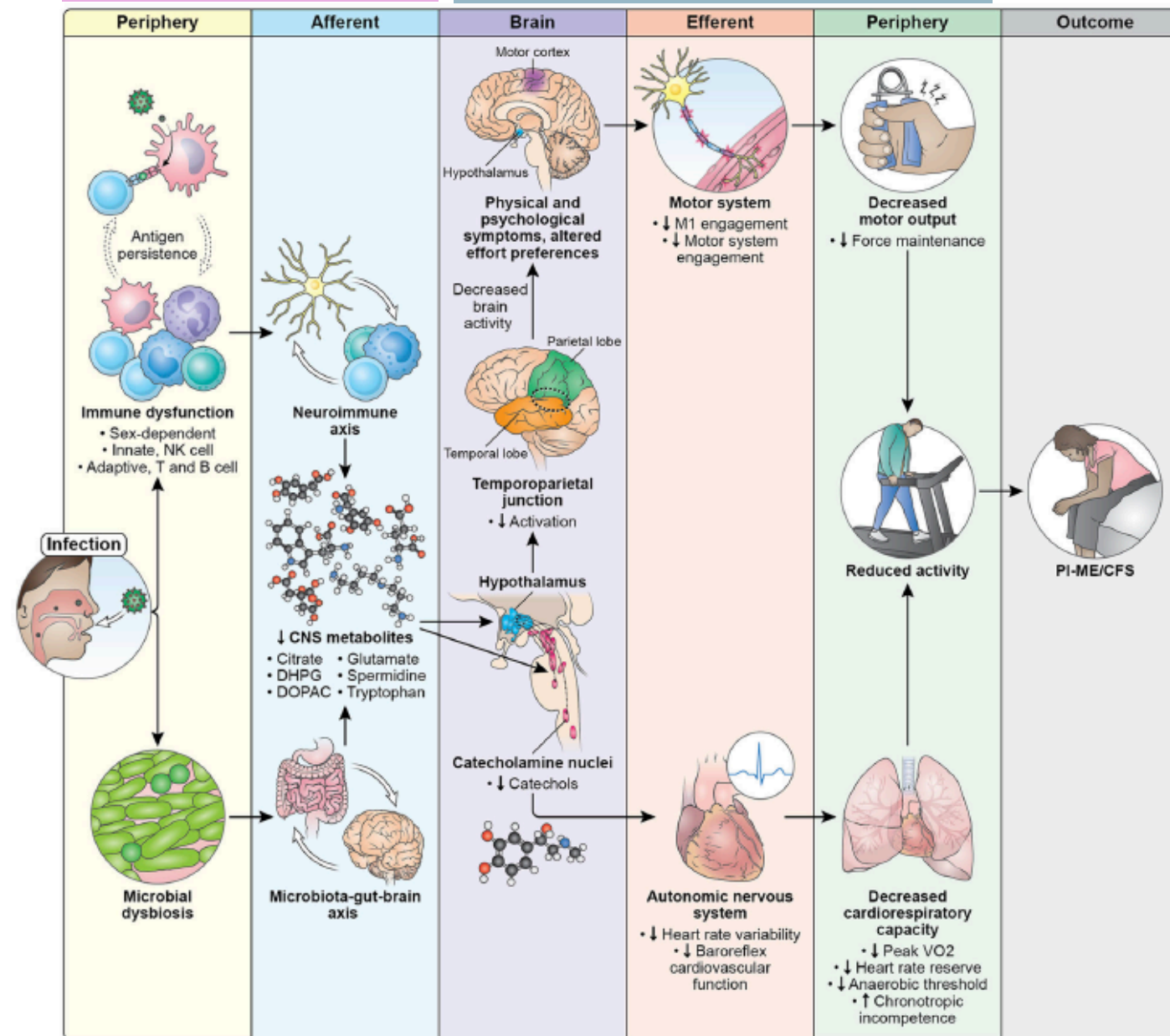
Self
perpetuating



Therapeutic approaches for ME/CFS

Reverse, Halt or Slow progression

Symptomatic treatment



Potential immunomodulatory agents for clinical trials in select ME/CFS populations

- Persistent antigen and T cell exhaustion:
 - Checkpoint inhibitors
- B cell activation (women)
 - Anti-CD20
 - Anti-CD19
 - BTK inhibitors (planned)
- T cell activation (men)
 - Mycophenylate
 - Tacrolimus
 - Jak/STAT inhibitors
- Innate immune activation
 - IL-1 blockers
 - IL-6 antagonist
 - TNF-alpha inhibitors
- Non-specific immune modulators
 - Intravenous immunoglobulin
 - Immunoabsorption (ongoing)

Patient suggested drugs

- Poly-IC
- Low dose naltrexone
- Thymosin alpha-1
- Alipripazole (Abilify)
- Supplements (nattokinase, serrapeptase or lumbrokinase)

Trial Design

- Platform
 - Multiple drugs can be studied simultaneously and compared to a single placebo arm
- Cross over study
 - All patients receive drug or placebo

Current Studies on PASC/ Long-COVID

Deep Phenotyping Study

925 inquiries: 33 patients enrolled

Intervention Studies

Intravenous Immunoglobulin

crossover placebo controlled

goal: 34 patients

recruited: 133 screened; 14 enrolled

Pembrolizumab (in development)

Tissue Reservoir (in scientific review)

Neuropathology Study (on going)



Deep phenotyping of post-infectious myalgic encephalomyelitis/chronic fatigue syndrome

Importance of this research

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Check for updates

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