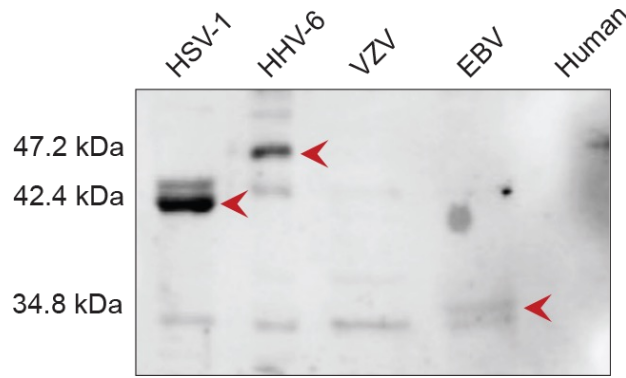


Mitochondrial dysfunction, herpesviruses and autoimmunity in ME/CFS and long COVID

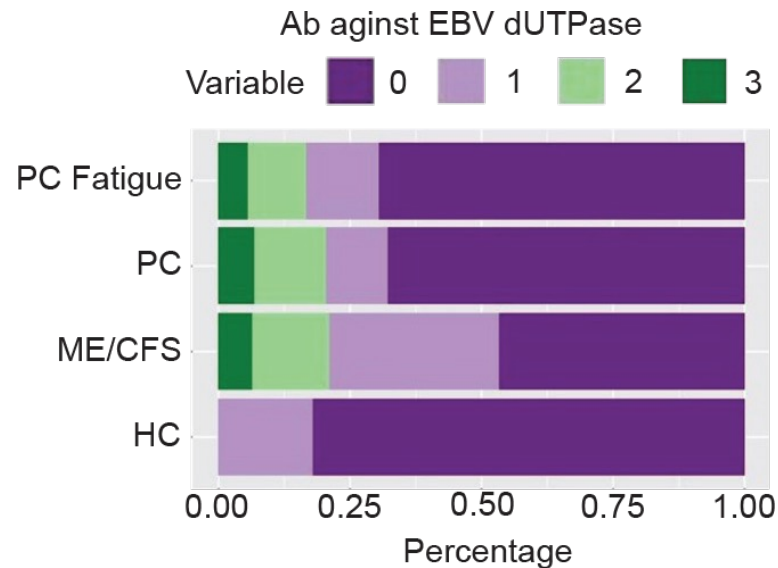
PD Dr. Bhupesh K Prusty

Institute for Virology and Immunobiology, JMU Würzburg

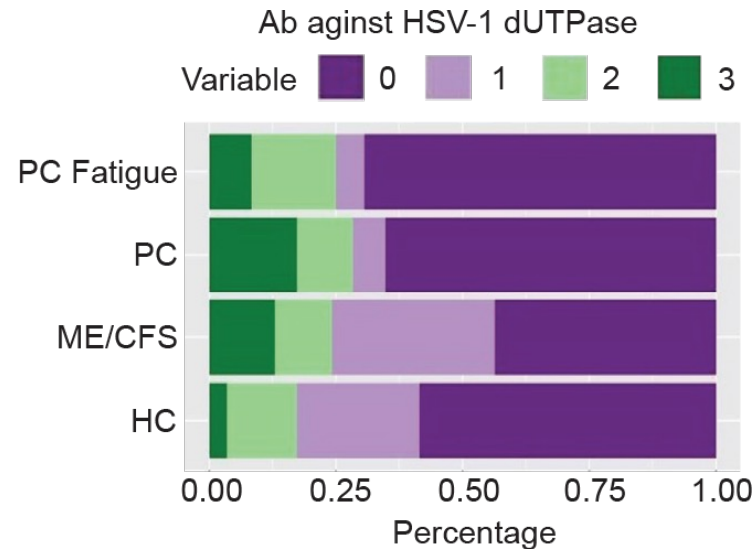
Herpesvirus signature in ME/CFS and long COVID



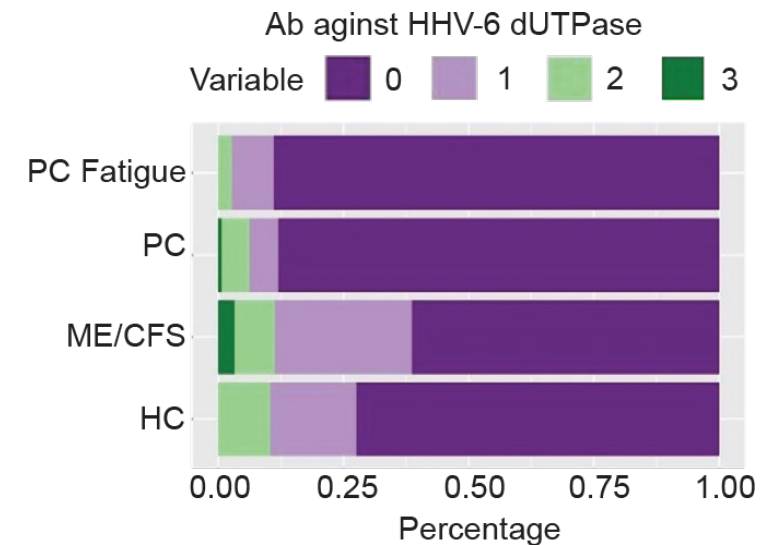
IgG detection in patient serum using recombinant proteins against specific herpesvirus dUTPase proteins



Kruskal-Wallis, $*P = 0.05464$



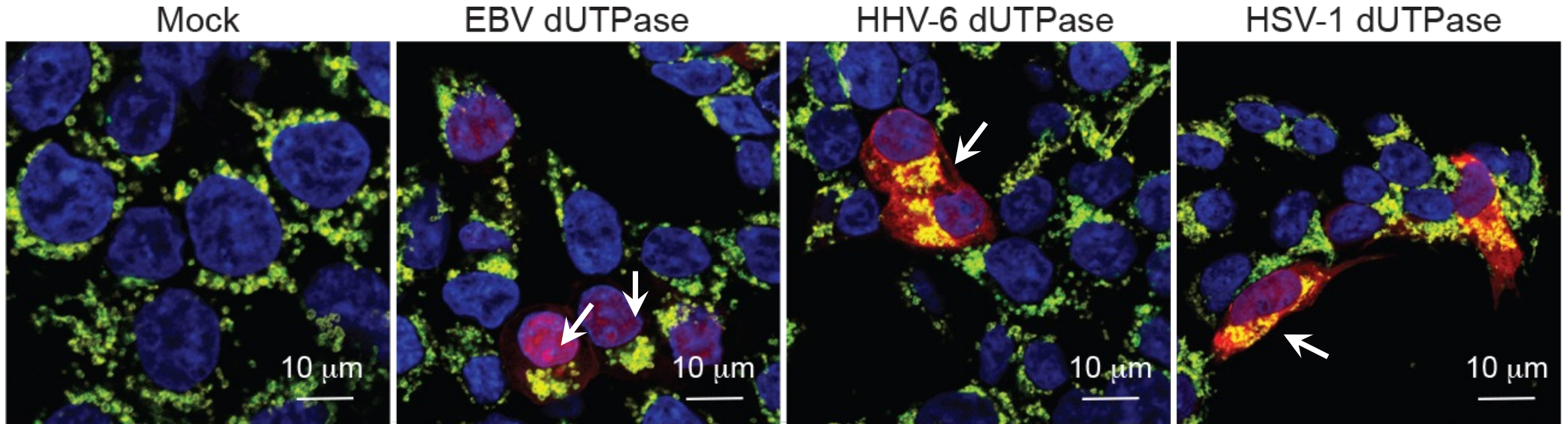
Kruskal-Wallis, $*P = 0.03066$



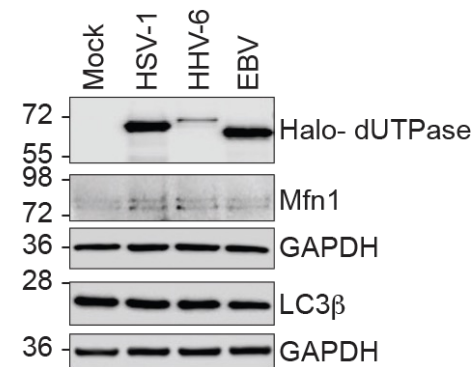
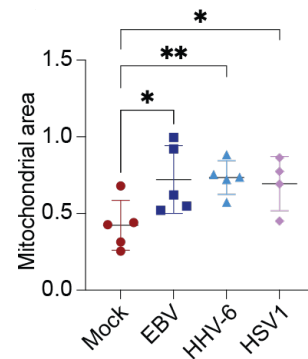
Kruskal-Wallis, $*P = 0.00657$

Likert chart with percentage of IgG antibody levels against EBV, HSV-1 and HHV-6 dUTPase

Functional significance of herpesvirus dUTPase proteins

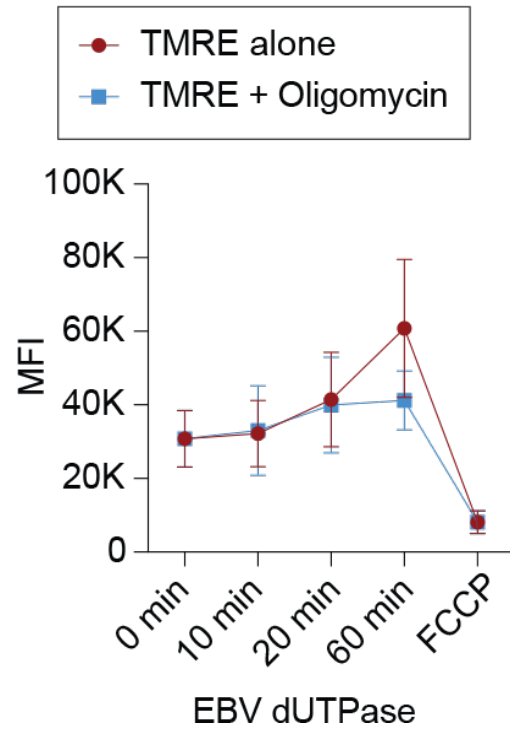


Tom20 Halo-dUTPase Mitofilin DAPI

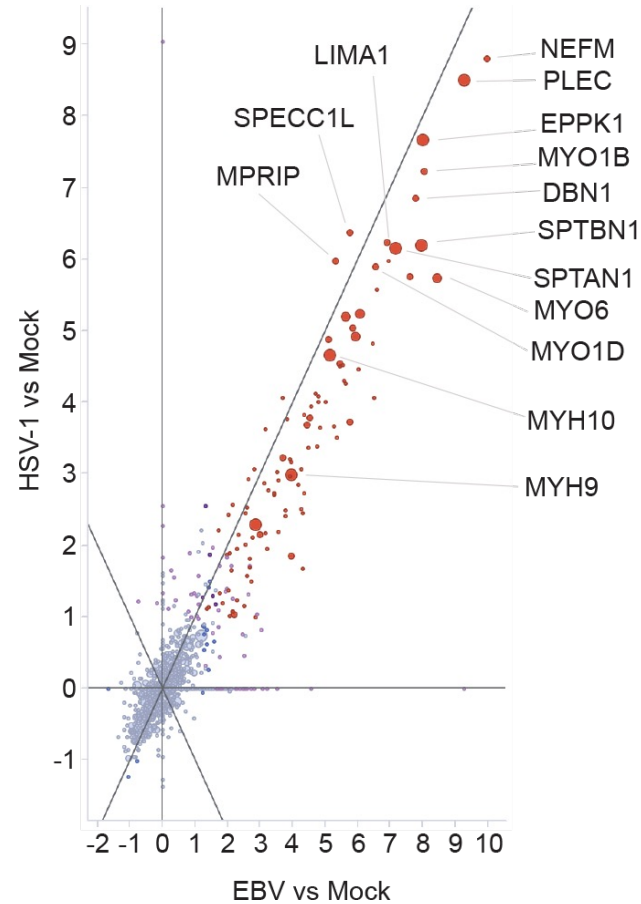


Mitochondrial hyperpolarization by herpesvirus dUTPases

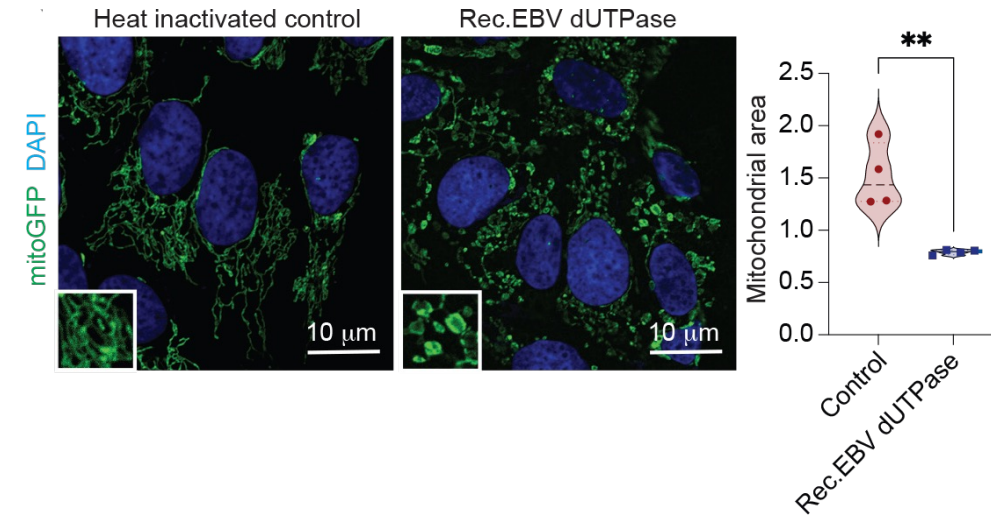
Functional significance of herpesvirus dUTPase proteins



EBV dUTPase damages mitochondrial energetics

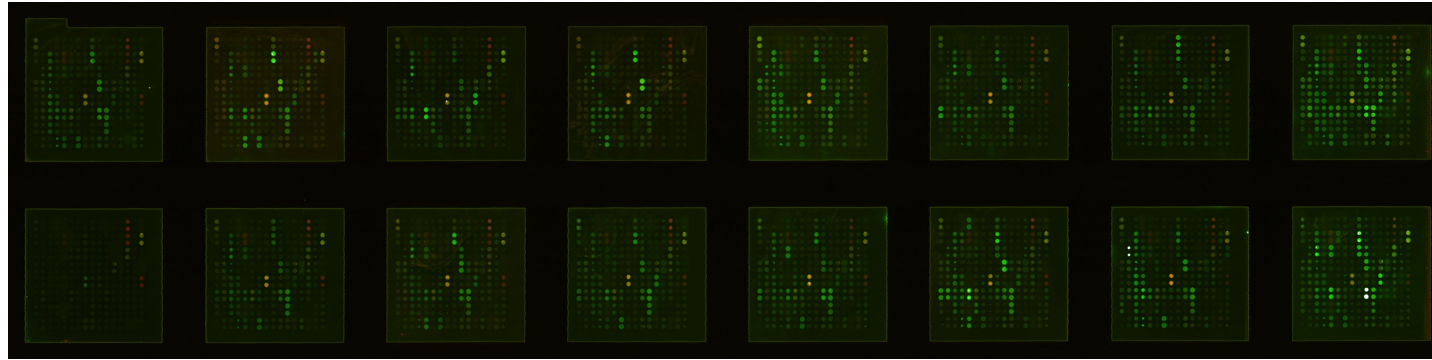


HSV-1, HHV-6 and EBV dUTPase target cellular cytoskeleton that leads to mitochondrial alterations

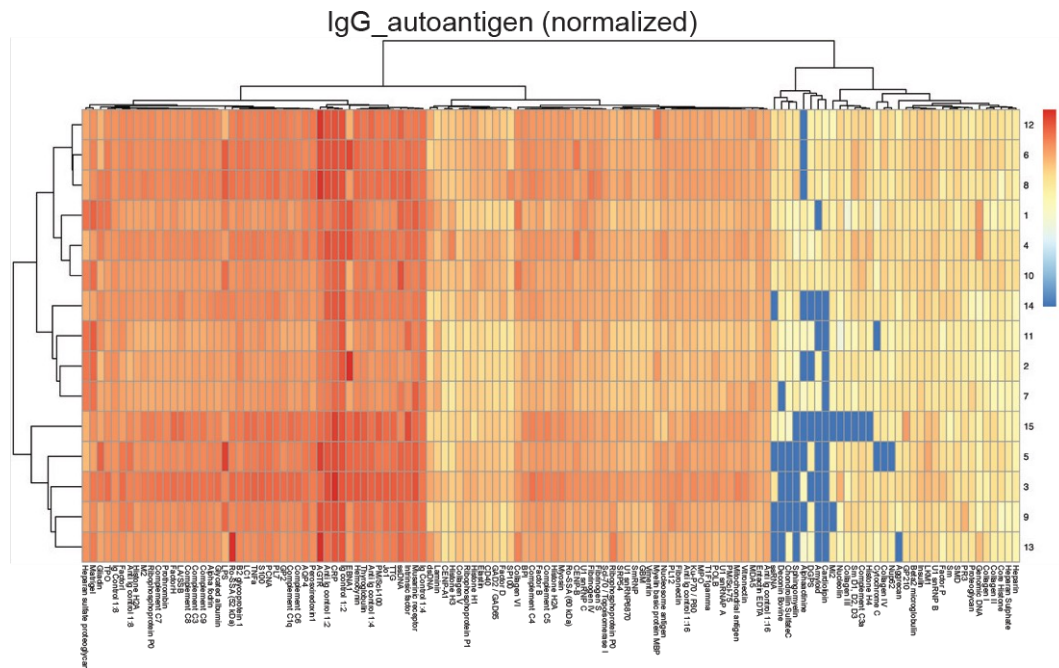


Extracellular herpesvirus dUTPases also hyperpolarize mitochondria but differently

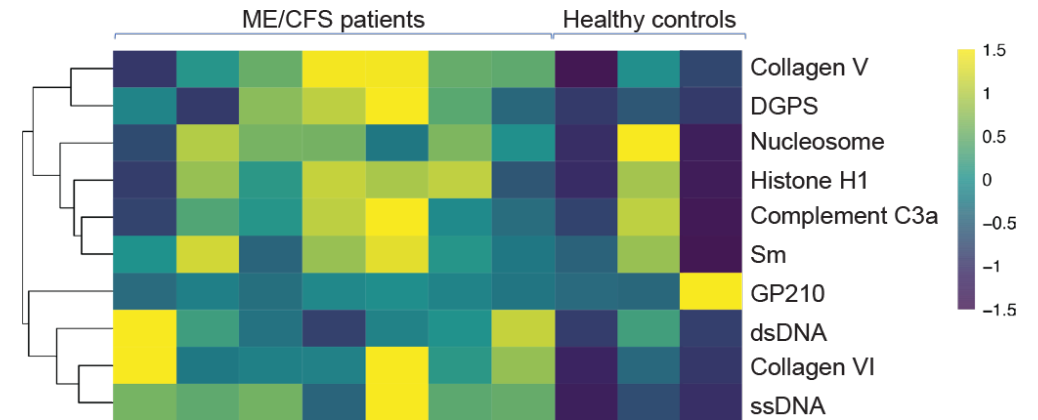
ME/CFS and autoimmunity



Protein microarray to detect IgG and IgM against 120 different autoantigens and pathogenic antigens

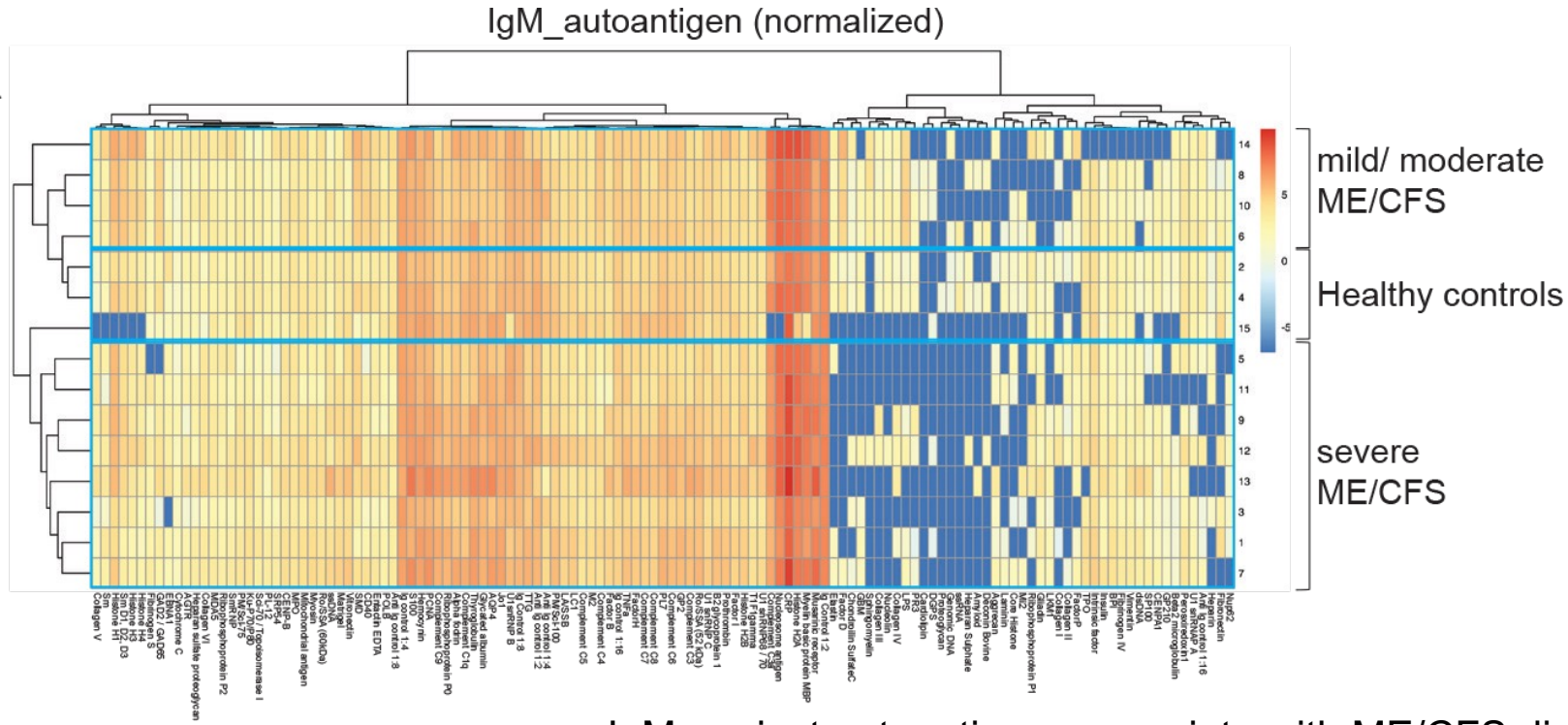


IgG autoantibody pattern is not associated with disease severity

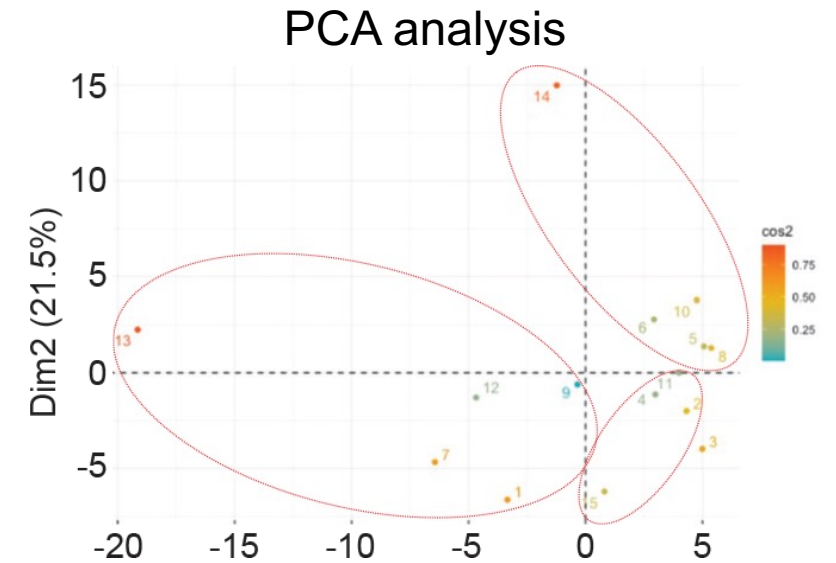


ME/CFS patients have overlapping autoantibodies with SLE and MS

ME/CFS and autoimmunity

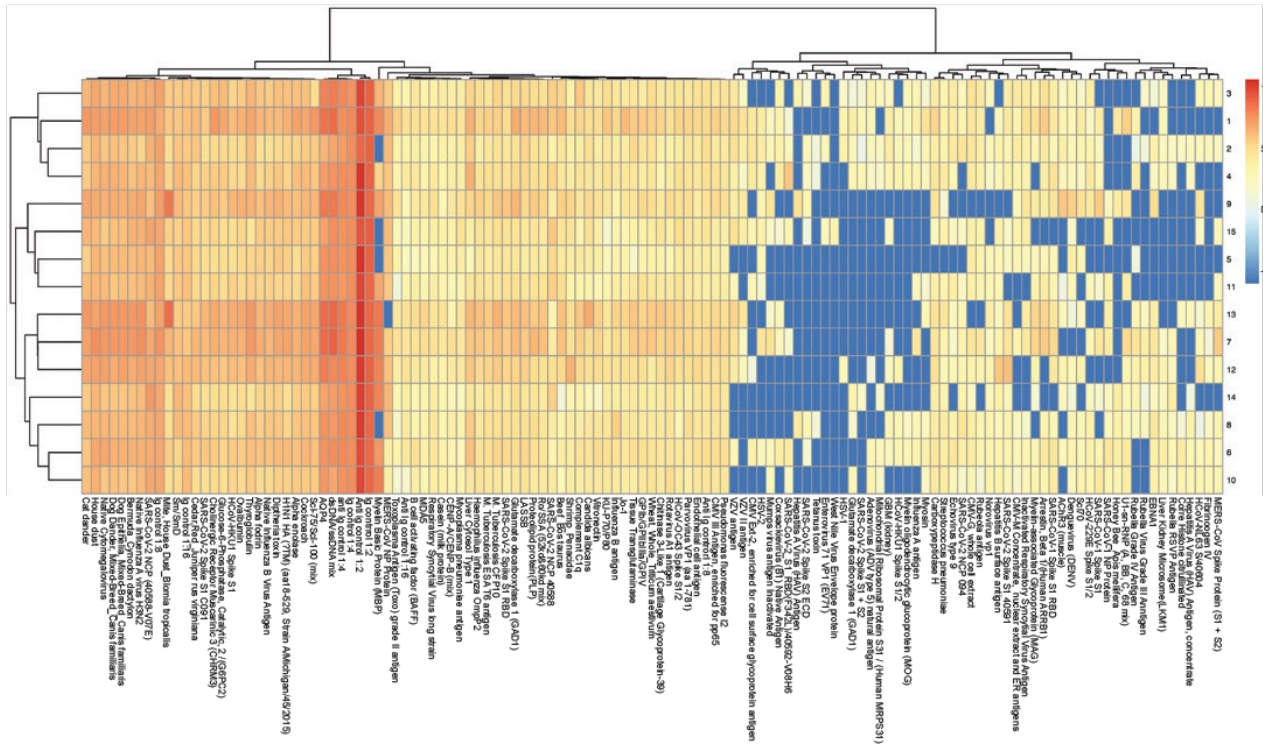


IgM against autoantigens associate with ME/CFS disease severity

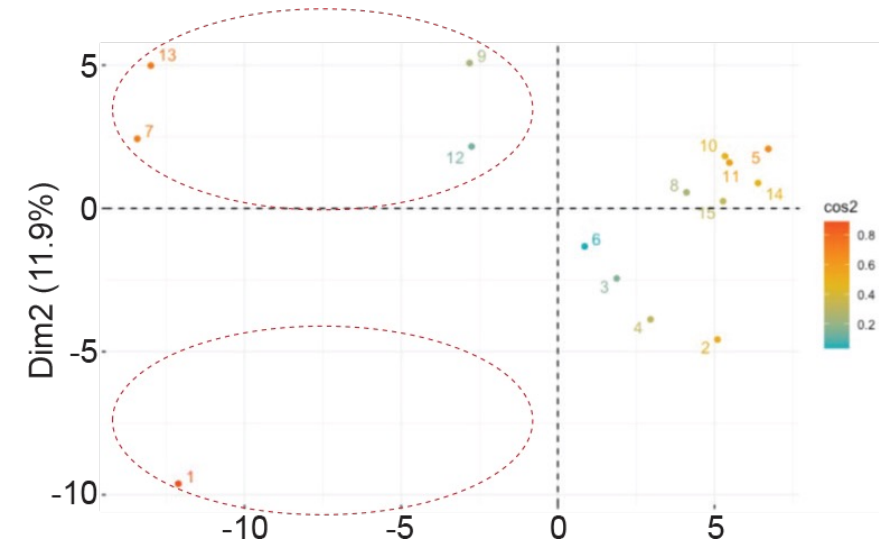


ME/CFS and autoimmunity

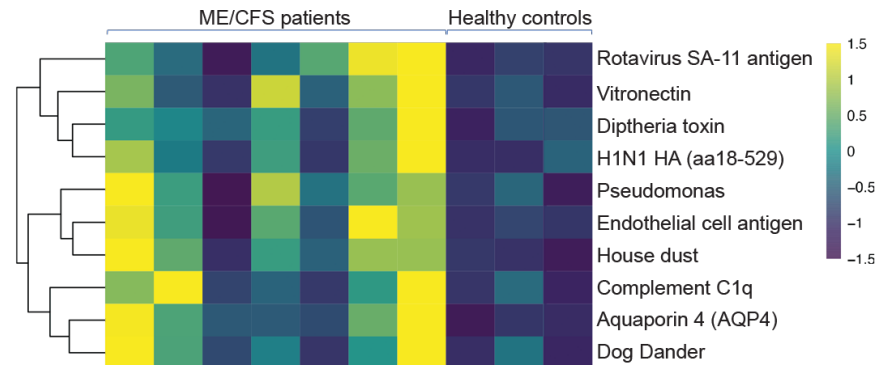
IgM_pathogenic antigen (normalized)



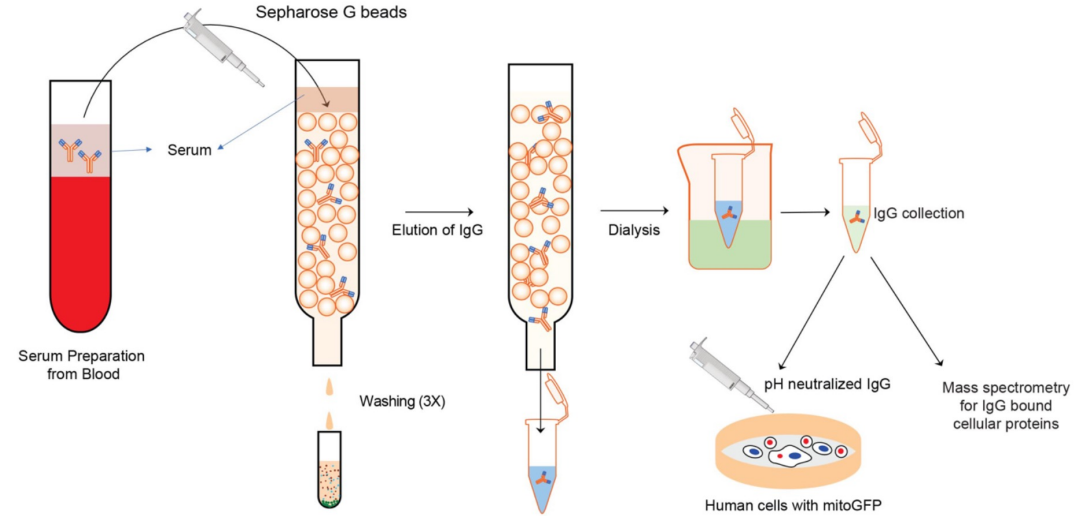
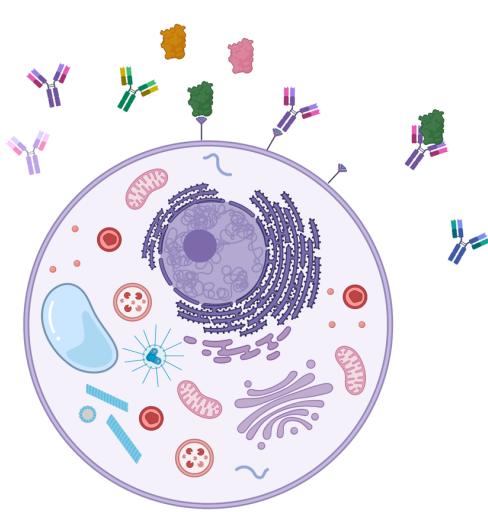
PCA analysis



Increased IgM response against common pathogenic antigens in ME/CFS patients



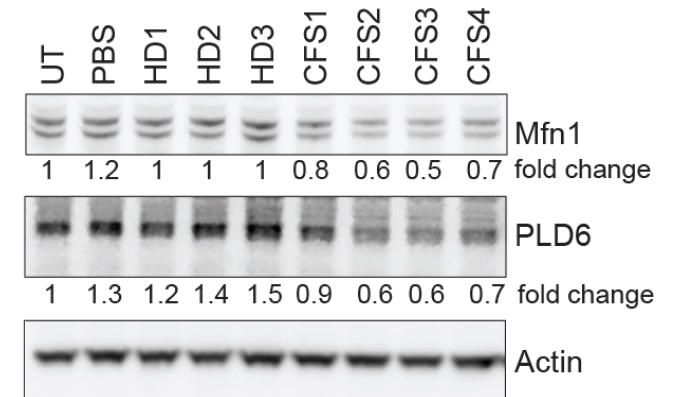
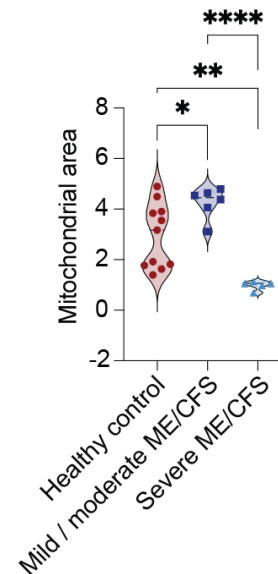
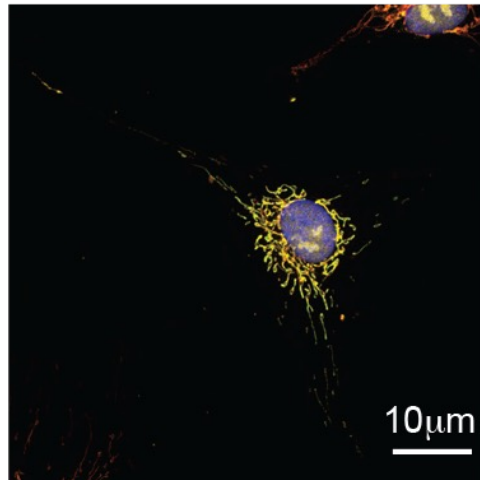
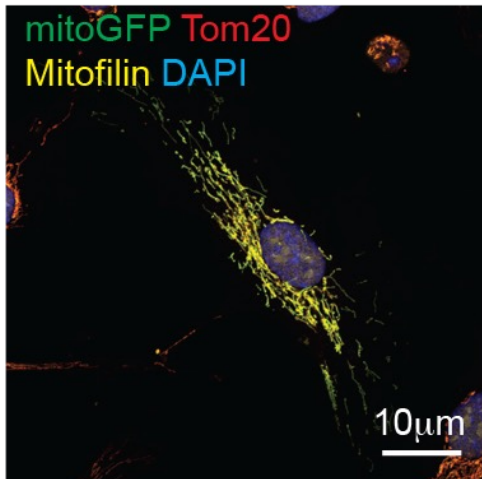
Circulating immunoglobulins and mitochondrial health



Immunoglobulin purification from patient serum

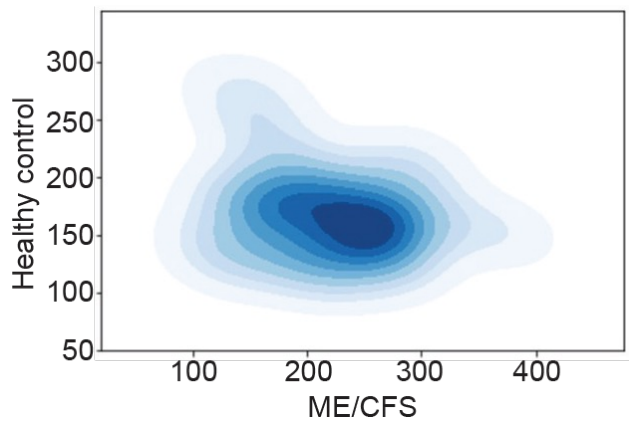
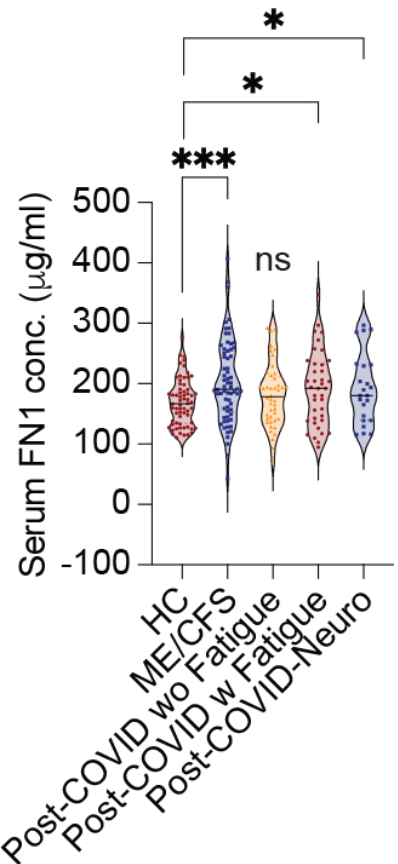
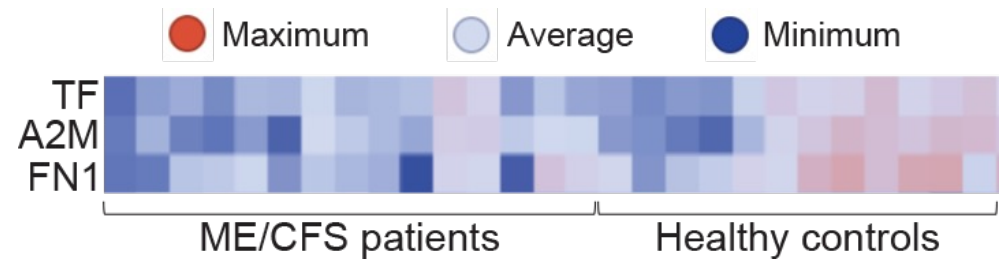
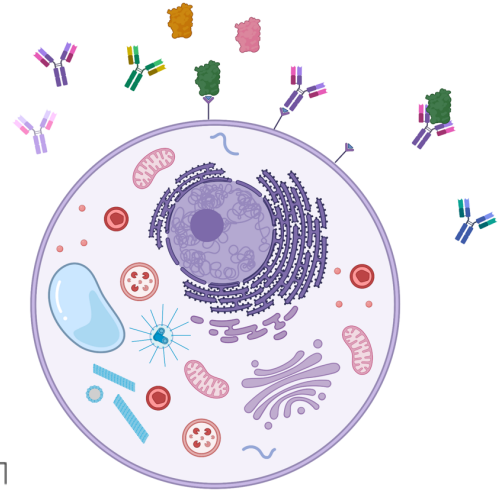
Healthy control

Severe ME/CFS

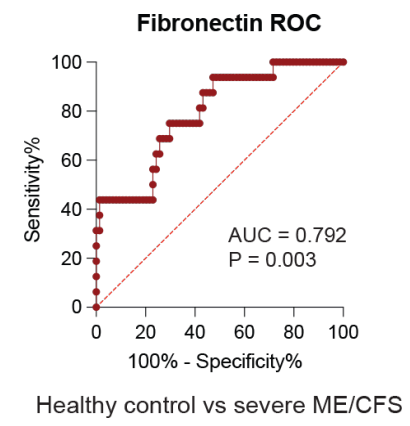
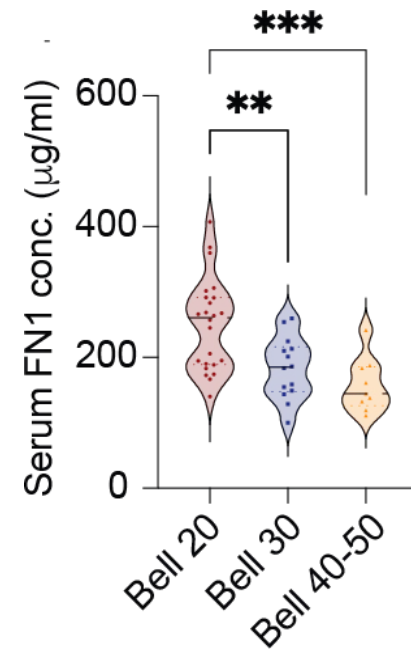
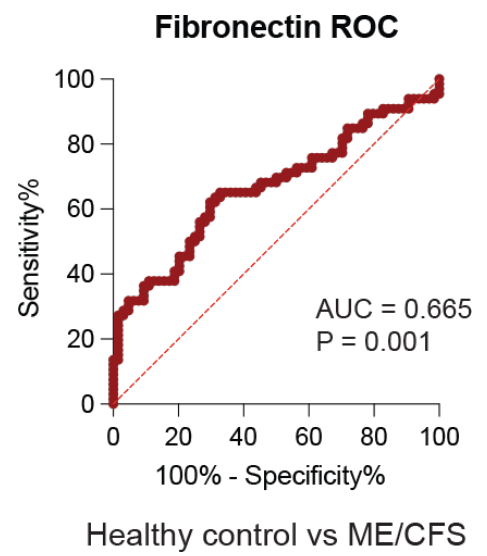


Immunoglobulins from severe ME/CFS patients can induce mitochondrial fragmentation in primary human endothelial cells

Circulating immune complex alterations in ME/CFS

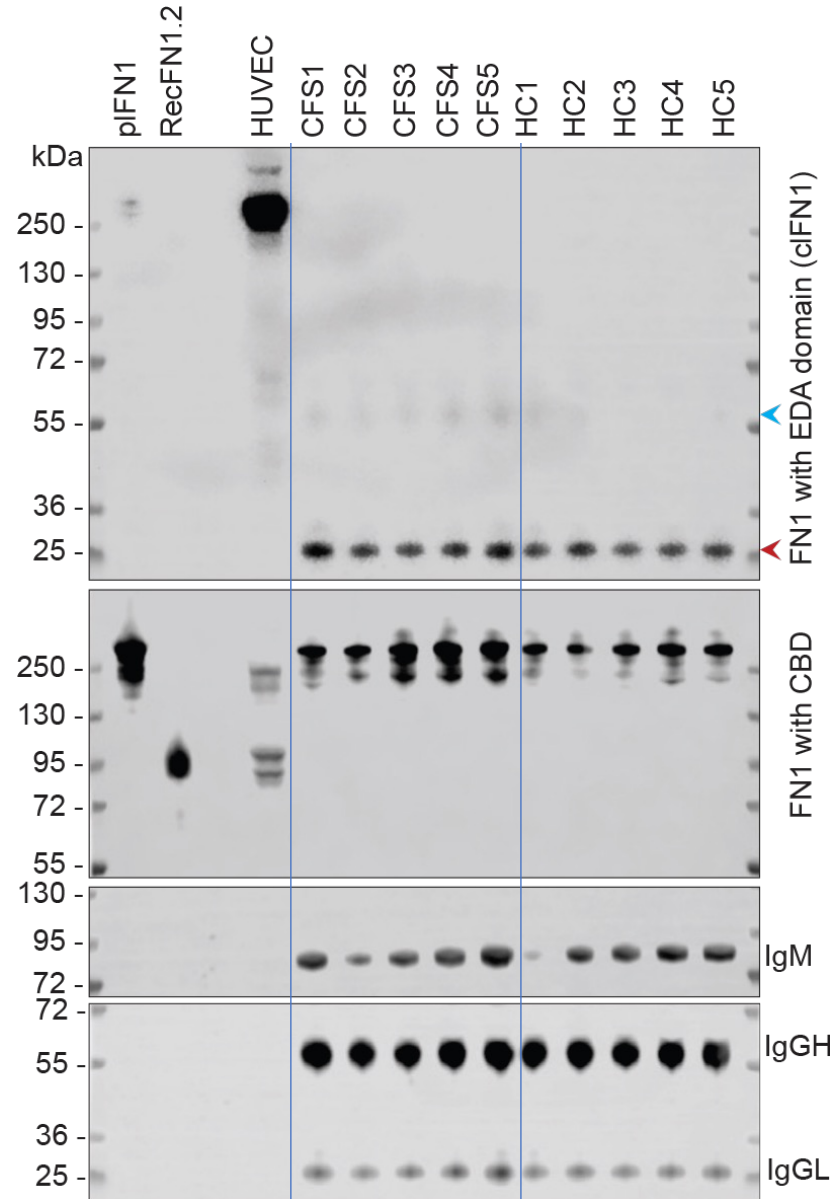


Kernel density plot showing the bivariate serum FN1 distributions



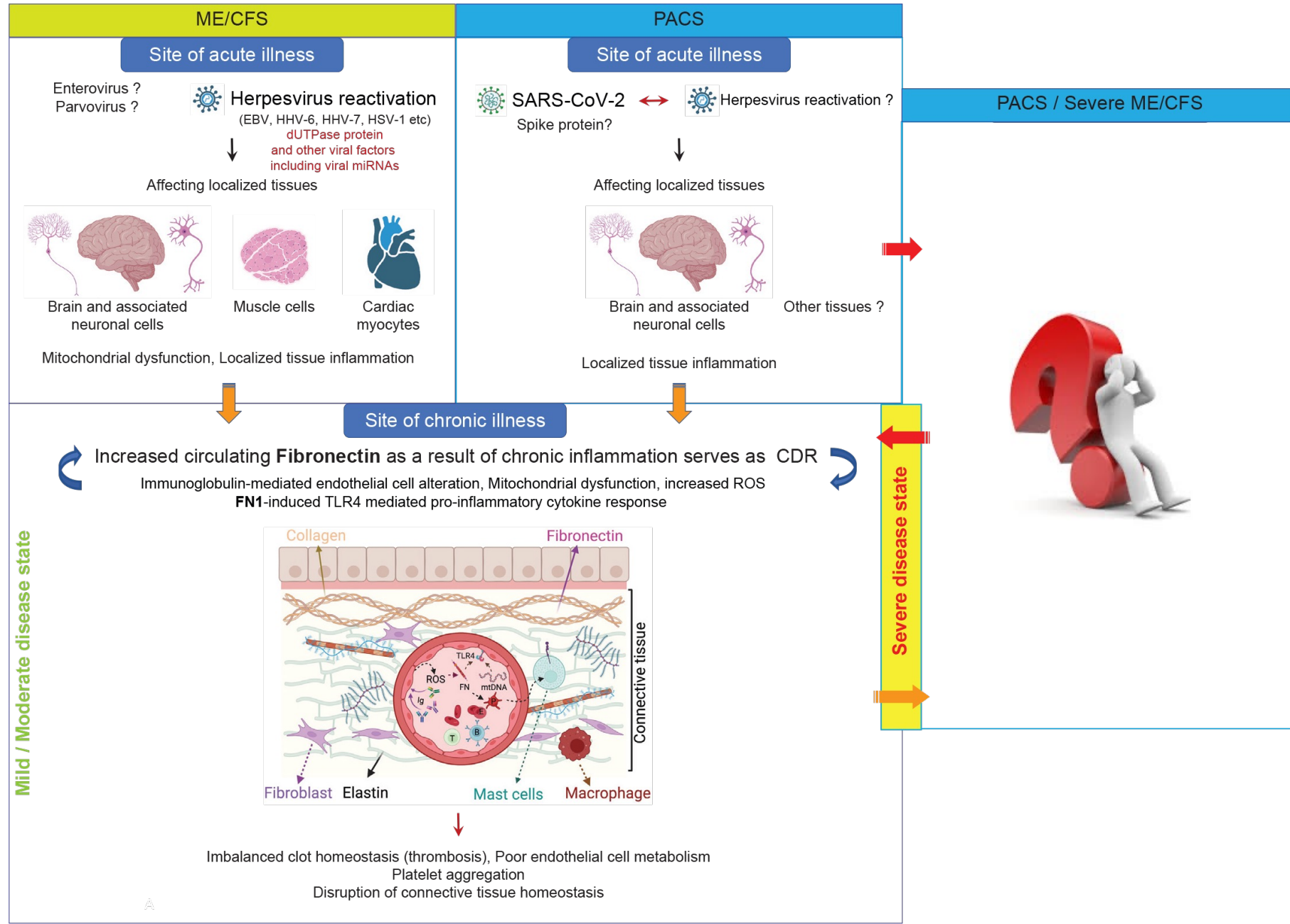
Circulating fibronectin levels are increased significantly in ME/CFS patients

Circulating fibronectin in ME/CFS and long COVID



Both plasma fibronectin as well as cellular fibronectin is increased in ME/CFS

ME/CFS shares only a few features with long COVID



Collaborative Partners and Funders

Prof. Carmen Scheibenbogen, Charite, Berlin

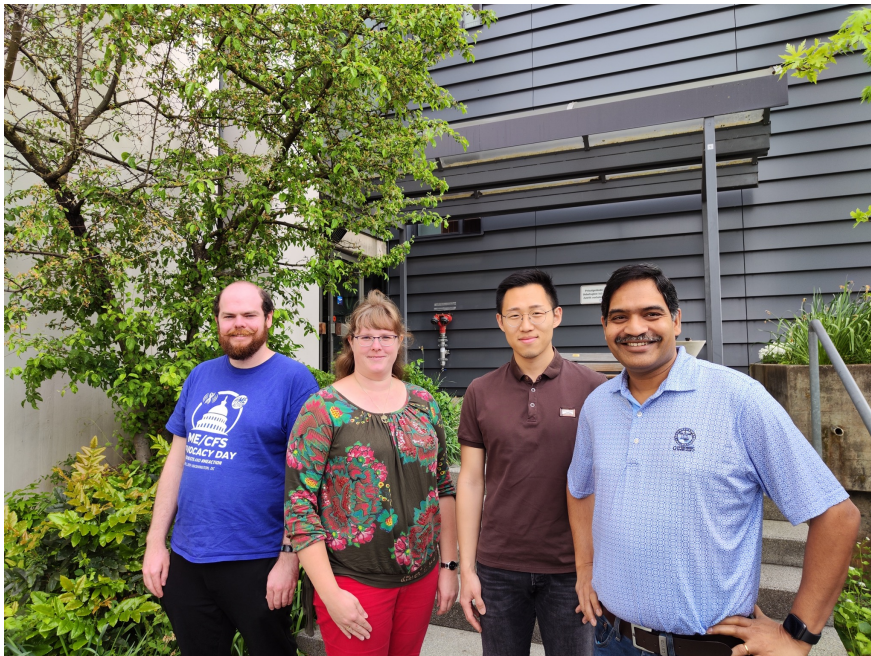
Prof. Uta Behrends, Helmholtz Zentrum, Munich

Dr. Franziska Sotzny, Charite, Berlin

Prof. Robert K Naviaux, UCSD, USA

Prof. Marshall V. Williams, Ohio State University, USA

Prof. Maria Ariza, Ohio State University, USA



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The ME/CFS Patient Community