

Title: RNA Binding Protein, FMRP, influences IL-6 gene expression and pyroptosis in macrophages

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The RNA binding protein, Fragile X messenger ribonucleoprotein (FMRP) has roles in translation, transcription and transport of mRNA. Silencing of the gene *FMR1*, that encodes for FMRP, has been documented to cause Fragile X Syndrome (FXS). FXS is an intellectual disorder that results in inhibited neural development. Not much is known for how individuals with FXS, those lacking FMRP, react in response to infection or the role FMRP has in the immune response. Our research explores the immune response primarily in bone marrow derived macrophages to *Listeria monocytogenes*. In response to a bacterial pathogen, macrophages lacking FMRP had reduced *IL6* gene expression and protein production. To assess if the loss of FMRP affected canonical inflammation pathways, cells were primed via LPS or Pam3CSK4 then activated. To activate the NOD2 or NLRP3 or AIM2 inflammasome pathways, macrophages were stimulated using agonists: nigericin, muramyl dipeptide (MDP) and Poly(dA:dT), respectively. Macrophages lacking FMRP treated with nigericin and MDP had significantly more cell death than with cells that produced FMRP. These results show that FMRP is involved in regulating inflammatory gene expression as seen in a lack of IL6 response during infection and may offer some protection against pyroptosis.