ALLERGY

THE AMISH PARADOX IN NEJM 2016 EXPLAINED

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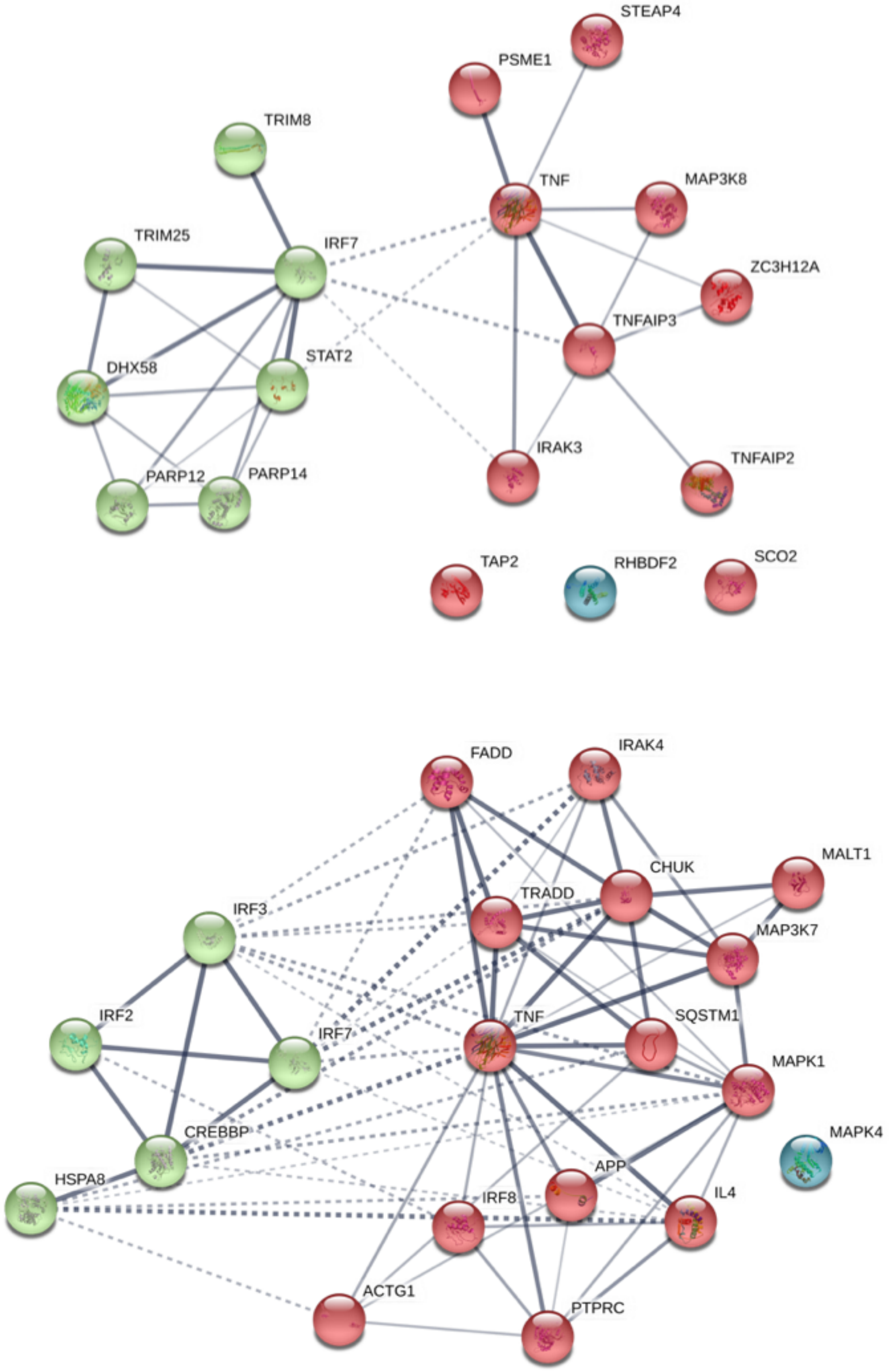
A recent study in the NEJM found remarkable differences in the asthma prevalence between Amish and Hutterite populations. The lifestyle of both communities is similar but their farming practice is distinct as the Amish follow a more traditional style of outdoor grazing whereas the Hutterities use industrialized farming practices. Gene expression data in the Amish children have been interpreted as „intense exposure to microbes“ because protection of experimental asthma by Amish derived house dust was nearly abrogated in mice deficient for MyD88.

Any helminth exposure has been excluded due to low IgE and eosinophil counts in the children while I still think that this could be an explanation in particular as the attempt to show an effect of bacterial exposure was unsuccessful since the discovery of the farming effect.

One difference between conventional stable (Hutterites) and outdoor grazing (Amish) is the higher helminthic infection rate on pasture, mainly with Fasciola, Ostertagia, Eimeria, Cooperia, Dictyocaulus and Trichostrongylos species.

Infected cattle rarely demonstrate clinical disease, while it is known that Fasciola (as for example Schistosome) has numerous immunosuppressive functions in the host. IgE is not always raised as Fasciola can degrade human immunoglobulin or even induce eosinophil apoptosis.



Re-analysis of Gene Expression Network using string-db.org (String Consortium 2019). The gene expression network in Amish children {Stein et al., 2016, #73074} in the upper area has similarities with the network observed in sheep after Fasciola infection {Fu et al., 2017, #6751} module #1 and #3, in the lower plot.