Discovery of IL-17 receptor activator by drug repurposing to alleviate social deficits in autism mouse model

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Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by significant impairments in social interaction and communication skills. While current treatments for ASD primarily target associated symptoms like anxiety and obsession, there is a notable lack of drugs specifically addressing core symptoms such as social deficits, despite the increasing prevalence of ASD. The IL-17 pathway has been implicated in the etiology and progression of ASD. Previous research by Reed et al. demonstrated the beneficial effect of IL-17 cytokine through stereotaxic injection, resulting in improved social behavior in autistic offspring[1]. However, to date, no small molecules with IL-17 therapeutic potential have been identified.

In this study, we discovered a compound modulating the IL-17 pathway by drug repurposing and investigated its impact on autism-like behaviors using the ASD mouse model. Through high-throughput screening, we identified an activator of the IL-17 pathway that effectively stimulates the IL-17 receptor and subsequent signaling cascade. In the maternal immune activation (MIA) mouse model, oral administration of the compound led to a notable alleviation of autism-like behaviors in the MIA model. This improvement was characterized by enhanced social interaction and ameliorated communication skills. These findings contribute to a better understanding of the neurobiological basis of autism spectrum disorders and provide insights for the development of novel therapeutic strategies for the treatment and management of ASD.

References

[1] Reed, M.D., et al., IL-17a promotes sociability in mouse models of neurodevelopmental disorders, *Nature,* **2020,** 577(7789), 249-253