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## Unraveling novel genetic pathways in autism through gene-environment interactions

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Gene-environment interactions may contribute to the risk of autism spectrum disorder (ASD). Previous evidence has inconclusively suggested that prenatal exposure to some medications may be associated with the risk of ASD. Little is known whether these medications may interact with some ASD-related genes to influence the risk of ASD. I have proposed a novel multi-step approach that combines bioinformatics screening and statistical interaction scans, to identify interactions efficiently supported by convergent lines of evidence. First, we have identified overlapped genes shared by ASD and several class-A, C drugs and quantified the level of attribute risk of each drug in the context of susceptibility to ASD. We found that ASD-related genes, such as INPP1, KIF5C and ST7 genes, of which expressions might be perturbed by a terbutaline – a beta 2 adrenergic receptor agonist. Our genome-wide interaction scan on 3,700 cases of ASD provides further discovered several variants in the ST7 (Suppression of Tumorigenicity 7) gene were significantly over-represented in cases with prenatal terbutaline exposure compared to cases without prenatal terbutaline exposure ( $p < 0.0001$ ). The convergent approach has confirmed that terbutaline may modify the effect of ST7 on the risk of ASD. These findings have also lent some support to the prior findings on the co-morbidity link between ASD and cancers. Further research on the impact of terbutaline-induced in-vivo functional changes of the ST7 gene on ASD-like phenotypes is warranted to validate our screening results.

### Biography

Ping-I (Daniel) Lin obtained his PhD and MD from Johns Hopkins University and National Taiwan University, respectively. He is trained as a Psychiatrist and genetic epidemiologist. He currently holds the position of Assistant Professor at Cincinnati Children's Hospital Medical Center in Ohio, USA. His publications in the field of neuropsychiatric research have been thus far cited by 1075 studies. His current research interests have been focused on the neurobiological basis of behavioral traits that occur across pediatric psychiatric disorders.

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