

**Biomedical Informatics Grand Rounds**  
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**A Multidimensional Precision Medicine Approach Identifies an Autism Subtype Characterized by Dyslipidemia**



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**Bio:** Yuan Luo is an Associate Professor at Department of Preventive Medicine, Division of Health & Biomedical Informatics at Feinberg School of Medicine in Northwestern University. He is Chief AI Officer at Northwestern University Clinical and Translational Sciences Institute and Institute for Augmented Intelligence in Medicine. His research interests include machine learning, natural language processing, time series analysis, computational phenotyping and integrative genomics, with a focus on biomedical applications. He won the American Medical Informatics Association (AMIA) New Investigator Award in 2020. He is currently an editor with JAMIA Open, JBI, Plos One, JHIR. He served on AMIA Membership and Outreach Committee.

**Abstract:** The promise of precision medicine lies in data diversity. More than the sheer size of biomedical data, it is the layering of multiple data modalities, offering complementary perspectives, that is thought to enable the identification of patient subgroups with shared pathophysiology. In our recent Nature Medicine paper, we use autism to test this notion and use state-of-the-art AI algorithms--graph clustering--to aggregate functionally related genetic mutations, and to find novel mechanisms of autism. By combining healthcare claims, electronic health records, familial whole-exome sequences, and neurodevelopmental gene expression patterns, we identified a subgroup of patients with dyslipidemia-associated autism.

**Educational Objects:** Upon completion, participants should be able to:

- Layering of multiple data modalities enables the identification of patient subgroups with shared pathophysiology.
- State-of-the-art graph clustering algorithms help to aggregate functionally related genetic mutations.
- Combining healthcare claims, electronic health records, familial whole-exome sequences, and neurodevelopmental gene expression patterns leads to identifying a subgroup of patients with dyslipidemia-associated autism.

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