

Children's Mercy Kansas City

## SHARE @ Children's Mercy

---

Research Days

GME Research Days 2021

---

May 11th, 11:30 AM - 1:30 PM

### Phenotypic characterization of JARID2-related intellectual disability: A case series

Maxime Cadieux-Dion

Let us know how access to this publication benefits you

Follow this and additional works at: <https://scholarlyexchange.childrensmercy.org/researchdays>



Part of the Higher Education and Teaching Commons, Medical Education Commons, Nervous System Diseases Commons, Pediatrics Commons, and the Science and Mathematics Education Commons

---

Cadieux-Dion, Maxime, "Phenotypic characterization of JARID2-related intellectual disability: A case series" (2021). *Research Days*. 16.

[https://scholarlyexchange.childrensmercy.org/researchdays/GME\\_Research\\_Days\\_2021/researchday2/16](https://scholarlyexchange.childrensmercy.org/researchdays/GME_Research_Days_2021/researchday2/16)

This Poster Presentation is brought to you for free and open access by the Conferences and Events at SHARE @ Children's Mercy. It has been accepted for inclusion in Research Days by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact [hlsteel@cmh.edu](mailto:hlsteel@cmh.edu).

## Phenotypic characterization of *JARID2*-related intellectual disability: A case series

**Submitting/Presenting Author (must be a trainee):** Maxime Cadieux-Dion  
**Primary Email Address:** mcadieuxdion@cmh.edu

- Medical Student  
 Resident/Psychology Intern ( $\leq 1$  month of dedicated research time)  
 Resident/Ph.D/post graduate ( $> 1$  month of dedicated research time)  
 Fellow

**Primary Mentor (one name only):** Carol Saunders

**Other authors/contributors involved in project:** Emily Farrow, Holly Welsh, Lauren Bartik, Caitlin Schwager, Randi Gadea, Kendra Engleman, Ana S.A Cohen, Elena Repnikova, Lei Zhang, John Herriges, Jennifer Gannon, Dihong Zhou, Shivarajan Amudhavalli, Isabelle Thiffault, Carol Saunders.

**IRB Number:** STUDY00000175

**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**

Data collection, analysis and writing of the abstract.

### **Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words**

**Background:** In recent years, wide implementation of research and clinical next generation sequencing has led to an astonishing number of novel disease-gene assertions. Recently, loss of function variants in *JARID2* were reported in 16 patients with a clinically distinct neurodevelopmental phenotype that consisted of neurodevelopmental delay, intellectual disability (ID), learning disability, autism and behavioral abnormalities. Dysmorphic features were seen in most patients and included high anterior hairline, deep-set eyes, full lips, broad forehead, bulbous nasal tip, or depressed nasal bridge. Cleft lip/palate was observed in only 1/16 patients. Most cases were *de novo*, with only one inherited case from an affected parent.

**Objectives/Goal:** The goal of the study was to identify additional patients with *JARID2* variants and further characterize the genotypic and phenotypic spectrum of the disease.

**Methods/Design:** We searched our internal database for patients with single nucleotide or copy number variants in *JARID2*. In one case, we further used long-range PacBio sequencing to aid in the interpretation of an intragenic duplication in *JARID2*.

**Results:** We present a case series of 9 patients with single nucleotide or copy number variants affecting *JARID2*. Full gene deletions, intragenic deletions and duplications ranging from 60 kb to 9.4 Mb were detected in 6 patients by clinical microarray. Long range next generation sequencing

of one duplication carrier suggested that it was in tandem. Three patients with loss of function single nucleotide variants were detected by clinical NGS. Parental testing was not available for most cases, but family histories of learning disability and behavior abnormalities were noted. In two cases, the variant was inherited from a mildly affected parent. Most patients had speech delays, global developmental delays and learning disability (7/9). Behavioral anomalies including autism, stereotypies, tics, repetitive movements and attention deficit were seen in 4/7 patients. Heterogeneous neurological abnormalities were observed in 4/7 patients and included ID, gait disturbances, strabismus, hypotonia, hearing loss, seizures and abnormal MRI findings. Dysmorphic features were observed in 6/9 patients. Several patients and at-risk relatives showed cleft lip/palate.

**Conclusions:** We provide further evidence of a gene-disease association for *JARID2* in intellectual disability. Our results are consistent with previously reported findings and reinforce that the phenotype may be variable, mild, and inherited from a mildly affected parent. In addition, our data shows that cleft lip/palate could be more commonly seen than previously reported in patients with *JARID2* variants. We also demonstrate the utility of long-range sequencing in resolving structural organization of intragenic duplications.