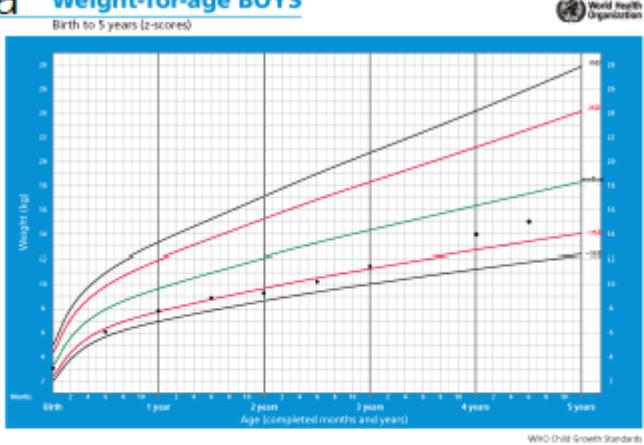


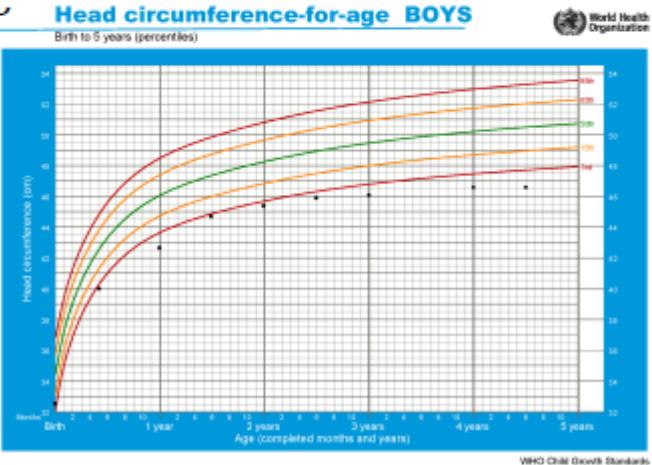
a Weight-for-age BOYS



b Length/height-for-age BOYS



c Head circumference-for-age BOYS



Supplementary Figure 1 Growth Charts of the proband.(a) weight for age chart
(b)length for age chart (c) head circumference for age chart

Supplementary Table 1 Clinical information on our patient and reported BRPS patients

		Our patient	Frequency cases ^[1-25]	in	reported
Sex		M	24F, 23M, 2NA		
SGA		-	6/43 (14.0%)		
Growth	Failure to thrive	+	33/43 (76.7%)		
	Poor growth	+	35/44 (79.5%)		
	Short stature < P3#	-	17/40 (42.5%)		
Head	Microcephaly < P3#	+	26/43 (60.5%)		
	Trigonocephaly	-	3/43 (7.0%)		
Facial Dysmorphisms ^a		+	33/44 (75%)		
Face	Prominent forehead	+	19/44 (43.2%)		
	Micrognathia	-	10/44 (22.7%)		
Eyes	Hypertelorism	+	12/44 (27.3%)		
	Downslanting palpebral fissures	+	22/44 (50.0%)		
	Strabismus	+	19/43 (44.2%)		
	Arched eyebrows	+	18/32 (56.3%)		
Nose	Prominent nasal bridge	-	7/44 (15.9%)		
	Short nose	-	7/44 (15.9%)		
	Anteverted nares	-	17/32 (53.1%)		
Mouth	High-arched palate	-	25/44 (56.8%)		
	Crowded teeth	+	5/36 (13.9%)		
Ears	Low-set ears	+	9/26 (34.6%)		
Gastrointestinal	Feeding difficulties	+	38/43 (88.4%)		
Skeletal	Scoliosis	-	6/37 (16.2%)		
	Arachnodactyly	-	9/35 (25.7%)		
	Ulnar deviation of hands at rest	-	13/35 (37.1%)		
Muscle	Hypertonic extremities	+	13/43 (30.2%)		
	Generalized or trunk hypotonia	+	41/45 (91.1%)		
Central Nervous System					
	Developmental delay	+	47/47 (100.0%)		
	Intellectual disability	+	43/43 (100.0%)		
	Poor or absent speech	+	42/42 (100.0%)		
	Seizures	-	15/46 (32.6%)		
Behavioral Manifestations					
	Autistic features	+	20/31 (64.5%)		

Notes: +: positive, -: negative, ^a: patients with equal or greater than 3 facial

characteristics were defined as facial dysmorphism; #: the value was compared with WHO child growth standards.

Abbreviation: F: female, M: male, NA: not available.

References

- 1 Bainbridge MN, Hu H, Muzny DM, Musante L, Lupski JR, Graham BH, Chen W, Gripp KW, Jenny K, Wienker TF, Yang Y, Sutton VR, Gibbs RA, Ropers HH. De novo truncating mutations in ASXL3 are associated with a novel clinical phenotype with similarities to Bohring-Opitz syndrome. *Genome Med* 2013; **5**: 11
- 2 Dinwiddie DL, Soden SE, Saunders CJ, Miller NA, Farrow EG, Smith LD, Kingsmore SF. De novo frameshift mutation in ASXL3 in a patient with global developmental delay, microcephaly, and craniofacial anomalies. *BMC Med Genomics* 2013; **6**: 32
- 3 Srivastava S, Cohen JS, Vernon H, Baranano K, McClellan R, Jamal L, Naidu S, Fatemi A. Clinical whole exome sequencing in child neurology practice. *Ann Neurol* 2014; **76**: 473-483
- 4 Zhu X, Petrovski S, Xie P, Ruzzo EK, Lu YF, McSweeney KM, Ben-Zeev B, Nissenkorn A, Anikster Y, Oz-Levi D, Dhindsa RS, Hitomi Y, Schoch K, Spillmann RC, Heimer G, Marek-Yagel D, Tzadok M, Han Y, Worley G, Goldstein J, Jiang YH, Lancet D, Pras E, Shashi V, McHale D, Need AC, Goldstein DB. Whole-exome sequencing in undiagnosed genetic diseases: interpreting 119 trios. *Genet Med* 2015; **17**: 774-781
- 5 Hori I, Miya F, Ohashi K, Negishi Y, Hattori A, Ando N, Okamoto N, Kato M, Tsunoda T, Yamasaki M, Kanemura Y, Kosaki K, Saitoh S. Novel splicing mutation in the ASXL3 gene causing Bainbridge-Ropers syndrome. *Am J Med Genet A* 2016; **170**: 1863-1867
- 6 Srivastava A, Ritesh KC, Tsan YC, Liao R, Su F, Cao X, Hannibal MC, Keegan CE, Chinnaian AM, Martin DM, Bielas SL. De novo dominant ASXL3 mutations alter H2A deubiquitination and transcription in Bainbridge-Ropers syndrome. *Hum Mol Genet* 2016; **25**: 597-608
- 7 Balasubramanian M, Willoughby J, Fry AE, Weber A, Firth HV, Deshpande C,

- Berg JN, Chandler K, Metcalfe KA, Lam W, Pilz DT, Tomkins S. Delineating the phenotypic spectrum of Bainbridge-Ropers syndrome: 12 new patients with de novo, heterozygous, loss-of-function mutations in ASXL3 and review of published literature. *Journal of medical genetics* 2017; **54**: 537-543
- 8 Dad R, Walker S, Scherer SW, Hassan MJ, Kang SY, Minassian BA. Hyperventilation-athetosis in ASXL3 deficiency (Bainbridge-Ropers) syndrome. *Neurology Genetics* 2017; **3**: e189
- 9 Giri D, Rigden D, Didi M, Peak M, McNamara P, Senniappan S. Novel compound heterozygous ASXL3 mutation causing Bainbridge-ropers like syndrome and primary IGF1 deficiency. *Int J Pediatr Endocrinol* 2017; **2017**: 8
- 10 Kuechler A, Czeschik JC, Graf E, Grasshoff U, Huffmeier U, Busa T, Beck-Woedl S, Faivre L, Riviere JB, Bader I, Koch J, Reis A, Hehr U, Rittinger O, Sperl W, Haack TB, Wieland T, Engels H, Prokisch H, Strom TM, Ludecke HJ, Wieczorek D. Bainbridge-Ropers syndrome caused by loss-of-function variants in ASXL3: a recognizable condition. *Eur J Hum Genet* 2017; **25**: 183-191
- 11 Bacrot S, Mechler C, Talhi N, Martin-Coignard D, Roth P, Michot C, Ichkou A, Alibeu O, Nitschke P, Thomas S, Vekemans M, Razavi F, Boutaud L, Attie-Bitach T. Whole exome sequencing diagnoses the first fetal case of Bainbridge-Ropers syndrome presenting as pontocerebellar hypoplasia type 1. *Birth Defects Res* 2018; **110**: 538-542
- 12 Chinen Y, Nakamura S, Ganaha A, Hayashi S, Inazawa J, Yanagi K, Nakanishi K, Kaname T, Naritomi K. Mild prominence of the Sylvian fissure in a Bainbridge-Ropers syndrome patient with a novel frameshift variant in ASXL3. *Clin Case Rep* 2018; **6**: 330-336
- 13 Contreras-Capetillo SN, Vilchis-Zapata ZH, Ribbón-Conde J, Pinto-Escalante D. Global developmental delay and postnatal microcephaly: Bainbridge-Ropers syndrome with a new mutation in ASXL3. *Neurología (English Edition)* 2018; **33**: 484-486
- 14 Koboldt DC, Mihalic Mosher T, Kelly BJ, Sites E, Bartholomew D, Hickey SE, McBride K, Wilson RK, White P. A de novo nonsense mutation in ASXL3 shared

- by siblings with Bainbridge-Ropers syndrome. *Cold Spring Harb Mol Case Stud* 2018; **4**: 1-6
- 15 Myers KA, White SM, Mohammed S, Metcalfe KA, Fry AE, Wraige E, Vasudevan PC, Balasubramanian M, Scheffer IE. Childhood-onset generalized epilepsy in Bainbridge-Ropers syndrome. *Epilepsy Res* 2018; **140**: 166-170
- 16 Verhoeven W, Egger J, Rakers E, van Erkelens A, Pfundt R, Willemse MH. Phenotypic characterization of an older adult male with late-onset epilepsy and a novel mutation in ASXL3 shows overlap with the associated Bainbridge-Ropers syndrome. *Neuropsychiatr Dis Treat* 2018; **14**: 867-870
- 17 Zhang R, He XH, Lin HY, Yang XH. [Bainbridge-Ropers syndrome with ASXL3 gene variation in a child and literature review]. *Zhonghua Er Ke Za Zhi* 2018; **56**: 138-141
- 18 Ababneh F, Nashabat M, Alfadhel M. A new case of Bainbridge–Ropers syndrome (BRPS): delineating the phenotype and review of literature. *Journal of Biochemical and Clinical Genetics* 2019: 65-69
- 19 Gou J, Zhou S, Cai H, Wang H. Bainbridge-Ropers syndrome: a case report and literature review. *Journal of Clinical Pediatrics* 2019; **37**: 212-214
- 20 Qiao L, Liu Y, Ge J, Li T. Novel Nonsense Mutation in ASXL3 causing Bainbridge-Ropers Syndrome. *Indian pediatrics* 2019; **56**: 792-794
- 21 Wayhelova M, Oppelt J, Smetana J, Hladilkova E, Filkova H, Makaturova E, Nikolova P, Beharka R, Gaillyova R, Kuglik P. Novel de novo frameshift variant in the ASXL3 gene in a child with microcephaly and global developmental delay. *Mol Med Rep* 2019; **20**: 505-512
- 22 Yang L, Guo B, Zhu W, Wang L, Han B, Che Y, Guo L. Bainbridge-ropers syndrome caused by loss-of-function variants in ASXL3: Clinical abnormalities, medical imaging features, and gene variation in infancy of case report. *BMC Pediatr* 2020; **20**: 287
- 23 Bai B, Zhang J, Su J, Zhang J, Jin C, Zhu S. Identifying the genetic etiology of a child with Bainbridge-Ropers syndrome. *Newspaper of Chongqing University*: 1-4

- 24 Zhang G, Wang J, Li S, Yang L, Wang M, Zhao Y, Zhu D. Bainbridge-Ropers syndrome in children: a case report and literature review. *Journal of Clinical Pediatrics* 2019; **37**: 297-300
- 25 Lyu Y, Zhao D, Zhang K, Gao M, Ma J, Wang D, Gai Z, Liu Y. Diagnosis of Bainbridge-Ropers syndrome due to de novo ASXL3 variant by high throughput sequencing. *Chinese Journal of Medical Genetics* 2020: 452-453-454



四川大学华西第二医院医学伦理委员会

伦理备案批件

医学科研 2018 伦审批第 (019) 号

课题负责人：李晋蓉，研究项目《中国西部儿童生长发育障碍性疾病遗传学研究及治疗随访》。本研究已提交研究方案、临床研究知情同意书、本院研究人员简历等材料，研究对象均在研究前知情告知。
经四川大学华西第二医院医学伦理委员会审议，同意该研究备案。

四川大学华西第二医院医学伦理委员会

日期：2018年6月30日

备案材料名称：

- 1、 医学伦理备案申请表；
- 2、 研究方案；
- 3、 知情同意书；
- 4、 本院研究人员简历。