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Class III malocclusion: Missense mutations in DUSP6 gene (Article)

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Abstract

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Objective: To determine the DUSP6 gene mutation in three generations of Malaysian Malay subjects having Class III malocclusion. **Material and Methods:** Genetic analyses of DUSP6 gene were carried out in 30 subjects by selecting three individuals representing three generations, respectively, from ten Malaysian Malay families having Class III malocclusion and 30 healthy controls. They were submitted Clinical Evaluation to clinical examination, lateral cephalometric radiographs, dental casts, and/ or facial and intra-oral photographs. Buccal cell was taken from each participant of Class III malocclusion and control groups. DNA extractions from buccal cell were carried out using Genra puregene buccal cell kit. Bio Edit Sequence Alignment Editor software was used to see the sequencing result. **Results:** A heterozygous missense mutation c.1094C>T (p. Thr 365 Ile) was identified in DUSP6 gene in three members of one family with Class III malocclusion, whereas no mutation was found in the control group. **Conclusion:** Current study successfully identified a missense mutation in DUSP6 gene among one Malaysian Malay family affected by Class III malocclusion. The outcome of this study broadened the mutation spectrum of Class III malocclusion and the importance of DUSP6 gene in skeletal functions. © 2019, Association of Support to Oral Health Research (APESB). All rights reserved.

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[Angle class III](#) [Genetic variation](#) [Malocclusion](#) [Missense](#) [Mutation](#)

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-
- 1 Hill, I.N., Blayney, J.R., Wolf, W.
The Evanston Dental Caries Study: XIX. Prevalence of Malocclusion of Children in a Fluoridated and Control Area
(1959) *Journal of Dental Research*, 38 (4), pp. 782-794. Cited 18 times.
doi: 10.1177/00220345590380040601
[View at Publisher](#)
-
- 2 Emrich, R.E., Brodie, A.G., Blayney, J.R.
Prevalence of Class I, Class II, and Class III Malocclusions (Angle) in an Urban Population An Epidemiological Study
(1965) *Journal of Dental Research*, 44 (5), pp. 947-953. Cited 84 times.
doi: 10.1177/00220345650440053301
[View at Publisher](#)
-
- 3 El-Mangoury, N.H., Mostafa, Y.A.
Epidemiologic panorama of dental occlusion
(1990) *Angle Orthodontist*, 60 (3), pp. 207-214. Cited 52 times.
[View at Publisher](#)
-
- 4 Baccetti, T., Reyes, B.C., McNamara Jr., J.A.
Gender differences in Class III malocclusion
(2005) *Angle Orthodontist*, 75 (4), pp. 510-520. Cited 40 times.
[View at Publisher](#)
-
- 5 Thilander, B., Pena, L., Infante, C., Parada, S.S., De Mayorga, C.
Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development ([Open Access](#))
(2001) *European Journal of Orthodontics*, 23 (2), pp. 153-167. Cited 183 times.
doi: 10.1093/ejo/23.2.153
[View at Publisher](#)
-
- 6 Staudt, C.B., Kiliaridis, S.
Different skeletal types underlying Class III malocclusion in a random population
(2009) *American Journal of Orthodontics and Dentofacial Orthopedics*, 136 (5), pp. 715-721. Cited 33 times.
doi: 10.1016/j.ajodo.2007.10.061
[View at Publisher](#)
-
- 7 Nakasima, A., Ichinose, M., Nakata, S.
Genetic and environmental factors in the development of so-called pseudo- and true mesioclusions
(1986) *American Journal of Orthodontics and Dentofacial Orthopedics*, 90 (2), pp. 106-116. Cited 17 times.
doi: 10.1016/0889-5406(86)90041-7
[View at Publisher](#)
-

- 8 Woon, K.C., Thong, Y.L., Abdul Kadir, R.
Permanent dentition occlusion in Chinese, Indian and Malay groups in Malaysia.
(1989) Australian orthodontic journal, 11 (1), pp. 45-48. Cited 28 times.
-
- 9 Alam, M.K., Islam, M., Haque, F., Hossain, M.M., Jamil, M., Islam, R.
Class III malocclusion with anterior open bite, orthodontic treatment in an adult patient: A clinical note
(2017) Int Med J, 24 (4), pp. 324-325.
-
- 10 Nowrin, S.A., Alam, M.K., Basri, R.
Genetic effect and prevalence of Class III malocclusion in different population: An Overview
(2015) Int J Pharma Bio Sci, 6, pp. 910-918.
-
- 11 Nowrin, S.A., Alam, M.K., Basri, R.
Genetic analysis: Future diagnostic tool in clinical orthodontics (Open Access)
(2015) Bangladesh Journal of Medical Science, 14 (3), pp. 310-311. Cited 3 times.
<http://www.banglajol.info/index.php/BJMS/article/download/20929/16292>
doi: 10.3329/bjms.v14i3.20929

View at Publisher
-
- 12 Nowrin, S.A., Alam, M.K.
Chin Cup in class III malocclusion: An update
(2017) International Medical Journal, 24 (3), pp. 264-267.
<http://uia4.tripod.com/>
-
- 13 Angle, E.H.
(1907) Treatment of Malocclusion of the Teeth: Angle's System. Cited 318 times.
Philadelphia: S.S. White Manufacturing Co
-
- 14 Downs, W.G.
Studies in the causes of dental anomalies
(1927) Genetics, 12 (6), pp. 570-580. Cited 4 times.
-
- 15 Gold, J.K.
A new approach to the treatment of mandibular prognathism
(1949) American Journal of Orthodontics, 35 (12), pp. 893-912. Cited 13 times.
doi: 10.1016/0002-9416(49)90085-8

View at Publisher
-
- 16 Monteleone, L., Prognathism, D.J.
(1963) J Oral Surg, 21, pp. 190-195. Cited 9 times.
-
- 17 PASCOE, J.J., HAYWARD, J.R., COSTICH, E.R.
Mandibular prognathism: its etiology and a classification.
(1960) Journal of oral surgery, anesthesia, and hospital dental service, 18, pp. 21-24. Cited 17 times.

-
- 18 Rubbrecht, O.
A study of the heredity of the anomalies of the jaws

(1939) American Journal of Orthodontics and Oral Surgery, 25 (8), pp. 751-779. Cited 19 times.
doi: 10.1016/S0096-6347(39)90224-3

View at Publisher
-
- 19 Dohmoto, A., Shimizu, K., Asada, Y., Maeda, T.
Quantitative trait loci on chromosomes 10 and 11 influencing mandible size of SMXA RI mouse strains

(2002) Journal of Dental Research, 81 (7), pp. 501-504. Cited 26 times.
<http://jdr.sagepub.com/content/by/year>
doi: 10.1177/154405910208100714

View at Publisher
-
- 20 El-Gheriani, A.A., Maher, B.S., El-Gheriani, A.S., Sciote, J.J., Abu-shahba, F.A., Al-Azemi, R., Marazita, M.L.
Segregation analysis of mandibular prognathism in Libya

(2003) Journal of Dental Research, 82 (7), pp. 523-527. Cited 48 times.
<http://jdr.sagepub.com/content/by/year>
doi: 10.1177/154405910308200707

View at Publisher
-
- 21 Cruz, R.M., Krieger, H., Ferreira, R., Mah, J., Hartsfield Jr., J., Oliveira, S.
Major gene and multifactorial inheritance of mandibular prognathism

(2008) American Journal of Medical Genetics, Part A, 146 (1), pp. 71-77. Cited 49 times.
doi: 10.1002/ajmg.a.32062

View at Publisher
-
- 22 Yamaguchi, T., Park, S.B., Narita, A., Maki, K., Inoue, I.
Genome-wide linkage analysis of mandibular prognathism in Korean and Japanese patients

(2005) Journal of Dental Research, 84 (3), pp. 255-259. Cited 59 times.
doi: 10.1177/154405910508400309

View at Publisher
-
- 23 Frazier-Bowers, S., Rincon-Rodriguez, R., Zhou, J., Alexander, K., Lange, E.
Evidence of linkage in a hispanic cohort with a class III dentofacial phenotype

(2009) Journal of Dental Research, 88 (1), pp. 56-60. Cited 56 times.
doi: 10.1177/0022034508327817

View at Publisher
-
- 24 Li, Q., Li, X., Zhang, F., Chen, F.
The identification of a novel locus for mandibular prognathism in the Han Chinese population

(2011) Journal of Dental Research, 90 (1), pp. 53-57. Cited 34 times.
doi: 10.1177/0022034510382546

View at Publisher
-
- 25 Wang, Z., Moulton, J.

(2001) *Human Mutation*, 17 (4), pp. 263-270. Cited 461 times.
doi: 10.1002/humu.22

[View at Publisher](#)

- 26 Risch, N., Merikangas, K.
The future of genetic studies of complex human diseases

(1996) *Science*, 273 (5281), pp. 1516-1517. Cited 4002 times.
www.sciencemag.org
doi: 10.1126/science.273.5281.1516

[View at Publisher](#)

- 27 Nikopensius, T., Saag, M., Jagomägi, T., Annilo, T., Kals, M., Kivistik, P.A., Milani, L., (...), Metspalu, A.
A missense mutation in DUSP6 is associated with class III malocclusion

(2013) *Journal of Dental Research*, 92 (10), pp. 893-898. Cited 30 times.
<http://jdr.sagepub.com/content/by/year>
doi: 10.1177/0022034513502790

[View at Publisher](#)

- 28 Nowrin, S.A., Basri, R., Alam, M.K., Yusa, T., Nakano, J., Jaafar, S., Binti Mokhtar, K.I., (...), Osuga, N.
Craniofacial morphology of class III malocclusion with DUSP6 gene: Mutation and non-mutation groups (Open Access)

(2016) *Journal of Hard Tissue Biology*, 25 (3), pp. 247-256. Cited 4 times.
https://www.jstage.jst.go.jp/article/jhtb/25/3/25_247/_pdf
doi: 10.2485/jhtb.25.247

[View at Publisher](#)

- 29 Li, C., Scott, D.A., Hatch, E., Tian, X., Mansour, S.L.
Dusp6 (Mkp3) is a negative feedback regulator of Fgf-stimulated ERK signaling during mouse development (Open Access)

(2007) *Development*, 134 (1), pp. 167-176. Cited 157 times.
doi: 10.1242/dev.02701

[View at Publisher](#)

- 30 Ruan, W.H., Winger, J.N., Yu, J.C., Borke, J.L.
Induced premaxillary suture fusion: Class III malocclusion model

(2008) *Journal of Dental Research*, 87 (9), pp. 856-860. Cited 5 times.
<http://jdr.sagepub.com/cgi/reprint/87/9/856>
doi: 10.1177/154405910808700901

[View at Publisher](#)

- 31 Perillo, L., Monsurrò, A., Bonci, E., Torella, A., Mutarelli, M., Nigro, V.
Genetic association of ARHGAP21 gene variant with mandibular prognathism

(2015) *Journal of Dental Research*, 94 (4), pp. 569-576. Cited 22 times.
<http://jdr.sagepub.com/content/by/year>
doi: 10.1177/0022034515572190

[View at Publisher](#)

- 32 Xue, F., Wong, R.W.K., Rabie, A.B.M.
Genes, genetics, and Class III malocclusion

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- 33 Miraoui, H., Dwyer, A.A., Sykiotis, G.P., Plummer, L., Chung, W., Feng, B., Beenken, A., (...), Pitteloud, N.
Mutations in FGF17, IL17RD, DUSP6, SPRY4, and FLRT3 are identified in individuals with congenital hypogonadotropic hypogonadism ([Open Access](#))

(2013) American Journal of Human Genetics, 92 (5), pp. 725-743. Cited 97 times.
doi: 10.1016/j.ajhg.2013.04.008

[View at Publisher](#)

- 34 Sykiotis, G.P., Plummer, L., Hughes, V.A., Au, M., Durrani, S., Nayak-Young, S., Dwyer, A.A., (...), Pitteloud, N.
Oligogenic basis of isolated gonadotropin-releasing hormone deficiency ([Open Access](#))


(2010) Proceedings of the National Academy of Sciences of the United States of America, 107 (34), pp. 15140-15144. Cited 177 times.
<http://www.pnas.org/content/107/34/15140.full.pdf>
doi: 10.1073/pnas.1009622107

[View at Publisher](#)

- 35 Quaynor, S.D., Kim, H.-G., Cappello, E.M., Williams, T., Chorich, L.P., Bick, D.P., Sherins, R.J., (...), Layman, L.C.
The prevalence of digenic mutations in patients with normosmic hypogonadotropic hypogonadism and Kallmann syndrome

(2011) Fertility and Sterility, 96 (6), pp. 1424-1430.e6. Cited 52 times.
www.elsevier.com/locate/fertnstert
doi: 10.1016/j.fertnstert.2011.09.046

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