

(Form: Century 11 point, A4 size)

Report of "Research Award of Oral Sciences"

Major: Oral Sciences

Grade: 3

Department: Oral Bioscience

Name: Shao Wenhua

Title: The mechanism of Fat1 gene mutation-induced oral and maxillofacial dysplasia

1. Aim of research and results obtained (Approximately 400 words):

FAT cadherin are atypical cadherins, participates in cell differentiation and carcinogenesis. However, it is not clear what signalling pathways are involved in the development of facial deformities due to FAT1 defects. To elucidate the role of Fat1 in oral carcinogenesis and mandibular development, we established Fat1-knock-in (KI) mice model. As it is reported, Fat1 homozygous mutant (Fat1^{KI/KI}) mice exhibited neonatal lethal. We observed that 60% of Fat1^{KI/KI} at embryonic day 14.5 (E14.5) exhibit severe mandibular and tongue dysplasia. To further investigate the role of Fat1 in mandibular development, we analysed the first pharyngeal arch (1st arch), some E10.5 Fat1^{KI/KI} mice showed abnormal right-sided 1st arch. Then, we extracted RNA from the 1st arch of E10.5 Fat1^{KI/KI} and wild type littermates for RNA-seq. This study is expected to reveal the novel FAT1 functions and molecular pathways regulated by FAT1. Furthermore, this study will clarify the molecular regulation mechanism in the formation of the mandible and tongue.

2. Self-evaluation of research achievement:

This is a novel research topic, we started from designing to make Knock-in mice and found the maxillofacial development. For me, this is 100% new and I try to explore the mechanism by using new experimental techniques. It's a great chance to absorb a lot and earn an ability to be a good researcher.

3. Meeting presentation:

* Title, conference, venue, date, co-author, presentation (oral/ poster).

(Underline the speaker.)

The role of Fat1 gene mutation in maxillofacial dysplasia, 第59回四国歯学会、
Tokushima, Wenhua Shao, Yasuhiro Mouri, Yasusei Kudo. Poster

4. Journal publication:

* Title, journal, volume, number, paragraph, date, co-author.

(Underline the speaker.)

- 1) Establishment of repeated liver biopsy technique in experimental mice. **Hepatol Res.** Shao W, Ichimura-Shimizu M, Ogawa H, Jin S, Sutoh M, Toyohara S, Hokao R, Kudo Y, Tsuneyama K. (submitted).
- 2) Sustained chromosomal passenger complex activity regulates pluripotency of human pluripotent stem cells. **Commun Biol.** Tsunematsu T, Mouri Y, Shao W, Arakaki R, Jan R, Murano K, Guardavaccaro D, Pagano M, Ishimaru N, Kudo Y. (under review).
- 3) Conversion from epithelial to partial-EMT phenotype by *Fusobacterium nucleatum* infection promotes invasion of oral cancer cells. **Sci. Rep.** Jul 22;11(1):14943. Shao W, Fujiwara N, Mouri Y, Kisoda S, Yoshida K, Yoshida K, Yumoto H, Ozaki K, Ishimaru N, Kudo Y.
- 4) The life in Japan and status of private dental office at the times of COVID-19. **Oral Dis.** 2021 Apr;27 Suppl 3:727-729. Tada H, Shao W, Ishimaru N, Kudo Y.
- 5) Prognostic value of partial-EMT-related genes in head and neck squamous cell carcinoma by a bioinformatic analysis. **Oral Dis.** 2020 Apr 11. [Online ahead of print]. Kisoda S, Shao W, Fujiwara N, Mouri Y, Tsunematsu T, Jin S, Arakaki R, Ishimaru N, Kudo Y.
- 6) Mechanism of cadmium poisoning on testicular injury in mice. **Oncol Lett.** 2019 Aug;18(2):1035-1042. Ren Y, Shao W, Zuo L, Zhao W, Qin H, Hua Y, Lu D, Mi C, Zeng S, Zu L.
- 7) Achaete-Scute Homologue 2-Regulated Follicular Helper T Cells Promote Autoimmunity in a Murine Model for Sjögren Syndrome. **Am J Pathol.** 2019 Dec;189(12):2414-2427. Otsuka K, Yamada A, Saito M, Ushio A, Sato M, Kisoda S, Shao W, Tsunematsu T, Kudo Y, Ishimaru N.