Year: 2023　　　　　　　　　　**Type of Awards (Young)**
Name of Principal Investigator: Dr. Hui Chen　Affiliated Institution: Shandong University

About of the PI

- Introduction & Education:

Overview of your academic background and research focus, highlighting milestones of your journey as a researcher.

Education:
[1] 2005-2010 Bachelor Binzhou Medical University, Yantai, China
[2] 2010-2013 Master Shandong University; Jinan, China
[3] 2013-2017 Vrjie Universiteit; Amsterdam, the Netherlands
Research focus:
Dental sleep medicine, especial obstructive sleep apnea (OSA)

- Career Trajectory:

Pivotal moments in your career, including positions held, significant projects, and notable achievements.

Positions:
[1] Position: Orthodontist, Associate researcher, Shandong University, China
Date: 01.10.2020-present
[2] Position: Postdoctoral Fellow, Shandong University, China
Visiting Postdoctoral Fellow, Université de Montréal, Canada
Date: 01.10.2018-30.09.2020
[3] Position: Researcher, Academic Centre for Dentistry Amsterdam (ACTA), the Netherlands
Date: 01.11.2017 – 30.09.2018

Achievements:
I have published eleven high-quality papers as first author in the international peer-reviewed journal, such as *sleep medicine reviews, journal of dental research*. Besides, I have won the research award six times during International congresses.

Significant publications:
[1] Chen H (*), Elham E, Kauffmann C, Rompre P, Almeida F, Schmittbuhl M, van der Stelt PF, Ge S (*), Lavigne G, Huynh N. Airway phenotypes and nocturnal wearing of dentures in elders with sleep apnea. Journal of Dental Research, 2023, 102(3): 263-269.
[2] Chen H, Eckert DJ, van der Stelt P, Guo J, Ge S, Emami E, Almeida FR, Huynh NT. Phenotypes of responders to mandibular advancement device therapy in obstructive sleep apnea patients: A systematic review and meta-analysis. Sleep Medicine Reviews, 2020, 49: 101229.

Honours:
[1] 2021: Young Investigator Award; Asian Society of Sleep Medicine; 1,500 USD.
[2] 2019: IADR STAR Network Academy Fellowship; International Association for Dental Research (IADR); 5,000 USD.
[3] 2019: First Prize Research Award; International Association for Dentomaxillofacial Radiology (IADMFR); 4,000 EUR.
[4] 2017: Travel Grant; International Association for Dentomaxillofacial Radiology (IADMFR); 1000 USD.
[5] 2016: Second Prize Research Award; European Association for Dental-maxillofacial Radiology (EADMFR);

1000 EUR.
[6] 2015: Finalist of the Research Award; International Association for Dentomaxillofacial Radiology (IADMFR).

- ## Research Contributions, Impact & Recognition:
Highlight major findings and contributions to your field, emphasizing the impact of your research.
Contributions:
My research contributed to the field of dental sleep medicine;
[1] Based on the CBCT images, develop a reliable and accurate protocol to segment the upper airway. This protocol has been used and cited in future research project;
[2] Discover the key anatomical character of the upper airway in the pathogenesis of OSA patients;
[3] Summarize the phenotypes of responder and non-responders to oral appliance of the OSA patients;
[4] Provide evidence for the clinical question "did the edentulous elderly OSA patients need to wear full denture?"
[5] Investigation the role of race in the etiology of OSA patients.

- ## Personal Insights:
Offer insights into your personal interests, values, and motivations as a researcher, sharing anecdotes that have influenced your perspective.
Personal interests:
My research interest is about the role of upper airway in the pathogenesis of obstructive sleep apnea (OSA) patients and in the treatment outcome of oral appliance therapy (OAT) of OSA patients.
Motivations:
My vision is to improve the quality of the life of OSA patients from both China and abroad. To achieve this vision, I am very active in initialized and carrying out international collaboration projects, such as a cooperation project on "The role of race in the pathogenesis of obstructive sleep apnea: Asians versus Caucasians" supported by Dutch Royal Science Society. Besides, my PhD supervisors at ACTA, the Netherlands are very supportive, and recommend their research collaborators in the field of dental sleep medicine to me. Therefore, I have network all around the world, such as Australia, Canada and the Netherlands. Together with the prestigious experts from those countries, we are now carrying out several research projects to improve the quality of the life in edentulous OSA patients.

- ## Future Directions:
Outline your envisioned research directions and aspirations, detailing how you plan to continue advancing knowledge and addressing emerging challenges in your field.
Research direction:
I will continue my research journey in the field of dental sleep medicine from the following aspects.
[1] Develop novel oral appliance such as invisible appliance to enhance the compliance of OSA patients;
[2] Focus on the relationship between oral health and OSA;
[3] Carry out multicentre research, to investigate the role of ethnicity on the treatment effect of oral appliance in OSA patients.

Brief Summary of the Project:
OSA is a life-threating sleep-related breathing disorder, associated with oxygen desaturations and arousals from sleep. There is evidence that OSA can increase the incidence of high blood pressure (hypertension), diabetes, and heart problems which could have fatal consequences. OSA is a public health problem, affecting at least 2-7% of the population. Even worse, it is estimated that approximately 80-90% of people meeting the criteria of at least moderate OSA remain undiagnosed. Therefore, it is important to diagnose, and treat OSA patients in an

early stage.

Continuous positive airway pressure (CPAP) is the gold standard treatment for OSA. However, the compliance of OSA patients with CPAP therapy is terribly poor. Oral appliance therapy (OAT) is a useful alternative to CPAP for the mild-to-moderate OSA and for the severe OSA who refuse or are unable to tolerate CPAP therapy. OATs hold the lower jaw and tongue forward making more space to breathe and prevent snoring. **Even though OAT therapy is preferred by OSA patients and considered to have high success rate for mild-to-moderate OSA patients, unfortunately 36% are unsuccessful, resulting in a rather large number of non-responders.** Besides, during the OAT titration procedure, the OSA patients are asked to have several follow-up visits to the clinic. Moreover, the cost of the two-piece custom-OAT OATs is very high. **It is both time and cost consuming especially for those non-responders to have OAT therapy, which places a significant burden on the health care system.** It is, therefore, essential to identify potential predictors associated with the outcome of OAT therapy in mild-to-moderate OSA patients. Better identifying of the potential predictors has important clinical implications, including the development of more efficient appliances, and improves the selection of patients for OAT therapy.