Docket #: S15-465A

Transnasal Endoscopic System for Olfactory Assessment and Treatment

Researchers at Stanford have developed a novel endoscopic system for electrical stimulation and signal recording of olfactory tissue through a minimally invasive nasal approach.

Over 20 million Americans suffer from smell loss, which significantly impacts quality of life since over 80% of taste perception depends on olfaction. Current treatment options for olfactory disorders are limited, and assessment methods lack precision for targeted therapy. Additionally, loss of smell can be an early indicator of neurodegenerative diseases and other systemic conditions.

This innovative system addresses these challenges through a cordless inflatable balloon equipped with multiple electrodes that can be precisely positioned within the nasal cavity. The tubular balloon expands to contact the olfactory epithelium, allowing for both therapeutic electrical stimulation to promote nerve regeneration and diagnostic signal recording to assess smell function. The device features openings that permit airflow for odorant testing, while the inflated balloon positions electrodes in contact with target tissues. An integrated amplifier system wirelessly connects to external processing equipment for remote monitoring and control. The system can be delivered through the nose and operates independently once positioned, enabling both assessment of olfactory dysfunction and targeted electrical therapy.

Stage of Development
Proof of concept with detailed device specifications and method validation

Applications

- Treatment of smell loss and olfactory dysfunction
- Assessment of olfactory system function and nerve activity

- Therapeutic stimulation for nerve regeneration after injury
- Early detection of neurodegenerative conditions through olfactory assessment

Advantages

- Minimally invasive nasal delivery eliminates need for surgical access
- Cordless operation allows precise positioning without external connections
- Multiple electrodes provide targeted stimulation with spatial resolution
- Wireless data transmission enables remote monitoring and control
- Integrated airflow design permits simultaneous odorant testing

Patents

- Published Application: WO2025072967

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