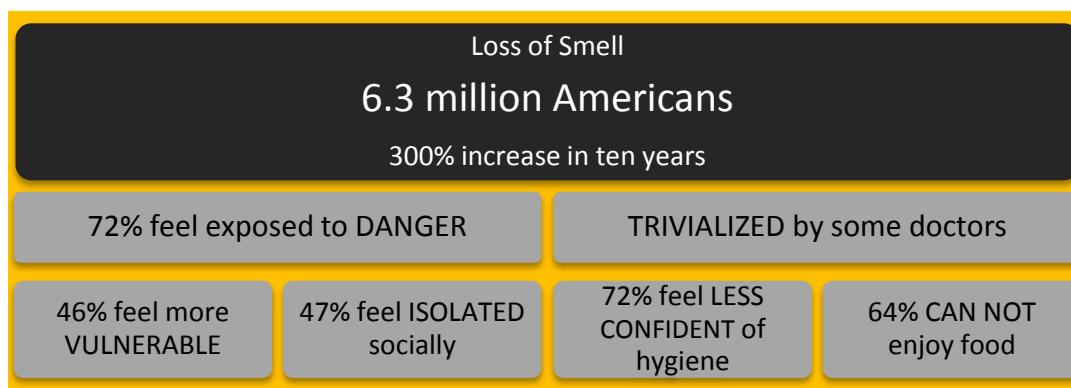


## SMELLING THE ROSES AGAIN: A DEVICE TO RESTORE THE SENSE OF SMELL



(Keller and Malaspina, 2013)

### The Problem

The Monell Chemical Sense Center has estimated that over 6.3 million Americans have reported a complete loss of smell. That is a significant increase from just ten years ago, when the NIH estimated that over 2 million persons in the U.S. alone could not smell or have a reduced ability to smell – **anosmia**.

**Anosmia** is a serious condition for those affected by it and it can have a profound impact on quality of life and more importantly safety. Practical problems of anosmia include difficulties avoiding hazardous events and the struggle to maintain healthy eating behaviors. The number of people suffering from anosmia is increasing world-wide as the population ages. Diseases associated with aging, including Parkinson's disease and Alzheimer's, increase the risk. In addition, viral infections and head trauma (including war-related trauma and sports injuries) are major causes that put the younger population at risk. The alarming increase in diabetes may also contribute to an increase in the disease.

Despite the impact on quality of life and an increasing incidence, disturbingly there is a lack of an effective treatment. Can losses in the sense of smell be reversed by any means? According to the NIH, there are currently no evidence-based preventive measures, interventions, or treatments available for anosmia.

### A Solution- Just Under Your Nose

Modeled on the life changing and well accepted Cochlear Implant, researchers at Virginia Commonwealth University have developed an olfactory (smell) implant device that uses external sensors to detect and transmit the signal to a processor which stimulates electrodes positioned on the olfactory bulb (where smell is detected). This device will allow patients to detect the presence or absence of odors as well as discriminate between odors.

Progress has been made in the development of a prototype device. Experimental equipment, hardware and software, has been acquired or developed to stimulate olfactory nerves and record olfactory bulb activity as needed for testing. In addition, an animal model has been established that has enabled testing of modifications and revisions of the prototype device. The inventors have developed a BNTX surgery method to generate a rat model of anosmia for future testing and are in the process of refining or modifying the prototype device hardware and electronics based on results.

The next steps needed in the development of the device include: continued refinement of the prototype in the animal model, and partnerships to develop a commercial product that can be entered into human clinical trials.

#### Inventors

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