

When the nose fails: COVID, infections, pollution and other horror stories.

Smell has been one of the most unappreciated senses through human history, being dismissed as communicate subjective feelings and linked to brutish instincts. However, with the advent of revolutionary advances in neuroscience, the sense of smell has been identified from the mid twentieth century as a new model for the study of the senses. The sense of smell is involved in the control of several physiological processes in vertebrates (e.g. reproduction, feeding and behavior). Consequently, partial damage or complete loss of the sense of smell can have deleterious consequences for the health and survival of vertebrates (including humans). This presentation will summarize the research focused in two main sources of disturbances in the sense of smell, pollutants and pathogens, using fish as a model species. On the area of environmental pollutants, this talk will focus on the effects of aquatic nitrite in olfactory function. Nitrogen is a dangerous agricultural pollutant because it undergoes nitrification as a part of the nitrogen cycle producing toxic nitrogenous compounds, as ammonia, nitrate and nitrite. I will show that aquatic nitrite is neurotoxic and alter olfactory function in fish with important implications for fish culture and fish wellbeing. In the subject of pathogens an olfaction, I will present our newly found immune olfactory function in aquatic vertebrates and how fish can be model to understand human olfactory diseases. This last subject includes our last advances in COVID research, the most recent daunting health issue in humans.