EVENT REPORT

Two Online Events with the BSP and SCS.

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BSP & BSF AbScent Webinar: Parosmia Unwrapped

This timely webinar featured academic research about the debilitating condition known as parosmia, where there is a distortion of smell and things taste and smell 'abnormal'. This is a symptom at the forefront of public awareness since anosmia (complete loss of smell) and parosmia can be symptoms of COVID-19. A large number of parosmic cases appear as a post-viral symptom and parosmia is classed as a quantitative olfactory disorder (that can both improve and worsen), along with anosmia (complete loss of smell/taste), phantosmia (smelling things that are not present) and hyposmia (decrease in the general ability to smell/taste).

The study initially sought to isolate which foods were potential triggers for parosmics in that they were specifically unpleasant or altered from what is generally accepted as normal. The foods identified all contain potent flavour chemicals: meat (MFT), coffee (FFT), cucumber and watermelon (2, 6-nonadienal), green peppers and peanuts (2-isobutyl-3-methoxypyrazine) and fried foods (2, 4-decadienal). The initial hypothesis was that the parosmics could only identify these potent chemicals but couldn't sense the other more subtle aromas that would normally 'balance' things out. In order to assess this, the study narrowed down the substances to a single one that had a reported effect on many parosmics and also one for which there was a very secure chemical analysis: coffee. They recruited some test subjects: 15 pre-COVID parosmics, 15 post-COVID parosmics, 15 non-parosmics. Using 'Sniffin' Sticks' featuring the aroma compounds, olfactory loss was measured and specific chemical triggers were isolated.

Thiols such as Furfural mercaptan were particularly triggering but interestingly, when those parosmics responsive by this chemical attempted to discuss the smell, they lacked the vocabulary to describe it (unlike the control group) using more hedonic terms such as 'disgusting', 'repulsive' and 'sweaty' as opposed to the normosmic descriptors like 'leather' and 'popcorn'. Thiols are also present in roast, grilled and barbecued foods, all of which are often particularly repellant to parosmics.

Once the trigger chemicals and the response of the test subjects had been assessed, the Reading team sought to investigate the biological cause of parosmia within the olfactory system. The first observation was that there was no correlation between the type of compound and the olfactory receptors. This led to further research on what substances are perceived as disgusting by parosmics. Interestingly this also uncovered a puzzling peculiarity whereby parosmics often found smells perceived by normosmics as unpleasant to be pleasing, such as faecal aromas for example, and were unable to detect certain 'unpleasant' chemicals at all: indole, p-cresol and skatole could not be perceived (foul is fair/ fair is foul).

The situation was obviously far more complex than simply certain receptors being inactive: -

- Parosmia is more than just a random imbalance of aromas
- It is not just about thresholds
- There is a common set of molecules that trigger distortions
  - These molecules tend to be potent and have very low thresholds
  - They separate into distinct groups
- There are no known receptors which are specific for the described trigger molecules
- Parosmia is independent of quantitative olfactory loss
- Parosmic odour quality is not related to odour concentration

The current hypothesis the team are working on seeks to explore the following biological scenario subsequent to viral infection: -

- Neurons had been lost and new ones needed to form
- The body's own defence mechanism impeded this process through scar tissue, accumulation of mucus and inflammatory response perhaps leading to 'cross-wiring'
- It isn't a purely random mis-wiring of receptors but very specific receptors are involved
- It could be down to a preferential rate of growth for these receptors

The current COVID crisis has massively increased the potential number of test subjects, in particular younger individuals, who are experiencing olfactory disorders. The Reading team have joined forces with Dr Puya Dehgani-Mobaraki, an ENT consultant at the forefront of research into this field, and are part of the Global Consortium for Chemosensory Research (https://gcchemosensr.org/) a worldwide study. Initial findings found that a diminishment of sensory perception was very common in COVID: 80% experienced decrease in olfactory function, 69% in gustation and 25% in chemesthesis (perception of hot and cold). There appears to be no relationship between these phenomena and nasal obstruction since, if it is present, it is unrelated to the reduction in sensory perception. However, certain protein receptors have been identified as more open to attack, namely ACE2 and TMPRSS2. Although the olfactory neurons are not directly affected, the conical sustentacular olfactory cells were, due to the prevalence of ACE2 and TMPRSS2 on their surface. These cells would need to regrow from the basal cells and their absence can explain the loss in olfactory perception. The ongoing research aims to further investigate this hypothesis and whether the 'mis-wiring' aspect is actually the case. No doubt updates to this research will be published in due course and we will be keeping our eyes peeled for these.

As you can see in some ways this webinar raised more questions than it actually answered as the research is ongoing. In the meantime as we wait for further data on the causes of parosmia, anyone who is dealing with parosmia or other olfactory disorders themselves might want to check out AbScent's website for support and potential treatment options or contribute to the Chemosensory study on COVID-related olfactory disorders mentioned above.