

Scientific Studies:

Odor Processing in MCS

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Researchers at the Department of Public Health Sciences, Division of Occupational Medicine, Karolinska Institute, Stockholm, Sweden just published a study in March entitled *Odor processing in multiple chemical sensitivity* (Hillert et al, 2007).

The researchers set out to determine whether subjects with MCS could have an increased odor-signal response in the odor-processing neuronal circuits. They used odor as the trigger and carried out positron emission tomography (PET) activation studies with various odors on 24 subjects consisting of 12 males and 12 females. The researchers were looking to see if there was a significant increase in regional cerebral blood flow (rCBF)

during smelling of the respective odorant compared to smelling of odorless air. There was no change in the baseline rCBF.

It is interesting to note that the MCS subjects activated odor-processing brain regions less than controls while experiencing decreased respiratory frequency and amplitude and heart rate variations as recorded R wave intervals (RR) on a surface electrocardiogram.

MCS subjects did show an increase in activation of the anterior cingulate cortex (a part of the brain situated in the medial aspect of the cortex) and cuneus-precuneus (a structure in the brain located in the parietal lobe) when subjected to the odors, indicating that the subjects with MCS processed odors differently. There were no signs of neuronal sensitization. These patterns were only present in response to odor signals leading researchers to hypothesize that the observed pattern of activation in MCS is a top-down regulation of odor-response via cingulate cortex.

Reference:

Hillert L, Musabasic V, Berglund H, Ciumas C, Savic I. Odor processing in multiple chemical sensitivity. *Hum Brain Mapp.* 2007 Mar;28(3):172-82.

