کارگاه‌های آموزشی مرکز اطلاعات علمی

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اصول تنظیم قراردادها

آموزش مهارت های کاربردی در تدوین و چاپ مقاله
Awaken olfactory receptors of humans and experimental animals by coffee odourants to induce appetite

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Summary  Smell and its mechanism has been of interest to scientists for many years. Smell, not only provides a sensual pleasure of food and perfumes for humans but also reminds us of past memories, thoughts, locations and finally warns of dangers such as fire. One of the uses of coffee beans is on perfume counters, enabling people to distinguish between perfume fragrances. We hypothesize that coffee can also be used to refresh olfactory receptors after cooking, since people usually experience loss of appetite after cooking. We have experienced an increase in appetite, after cooking, by smelling coffee beans. This is probably due to the detachment of food odourants from olfactory receptors by the coffee odourant molecules. We also think that coffee smell could be used in animal research studies, to keep animals healthy by stimulating their appetite. In a recent study, 28 different odourants have been identified from coffee. One or more of these odourants may have strong binding affinity to olfactory receptors which results in detachment of other odourants from the receptors. The high vibration intensity from coffee odourant molecules may cause the detachment of food odourant from olfactory receptors. Another hypothesis might be the unique structure of these coffee odourants. Studies need to be done to investigate the effect of coffee smell on salivary flow and appetite in animals and humans.

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Introduction

Smell is an important factor in the life of humans. It is an aesthetic sense that enables us to remember thoughts and memories of the past as well as a stimulant for appetite. Smell processing and the function of olfactory sensory receptors are very complex [1]. Axel and Buck, the winners of the
2004 Noble Prize for physiology or medicine have introduced an extraordinary olfactory sensory map, discovering over 1000 genes and receptors for the sense of smell, which allows us to remember over 10,000 odours [2,3].

Coffee, for some, is the most favorite drink not only for its taste and smell but also for the rich caffeine in it. Some studies even suggest that coffee smell leads to better driving [4] but coffee has other uses, one of which is on the perfume counter. A jar of coffee beans can be found on perfume counters since smelling coffee beans in between perfume sampling helps in distinguishing a perfume’s fragrance from another [5]. In one study, 28 different odourants have been identified from coffee [6]. One or more of these odourants may have strong binding affinity to olfactory receptors which results in detachment of other odourants from the olfactory receptors.

Hypothesis

Although cooking at home is fun for most people, there is a tendency to lose appetite afterward. We suggest that smelling coffee not only refreshes olfactory sensory receptors but also stimulates appetite. Our effort to smell coffee beans for about 3–4 min after cooking enabled our sensory smell to be refreshed and thereby increasing our appetite greatly. One or more of 28 coffee odourants might be responsible for appetite stimulation and detachment of other odourants from olfactory receptors.

Coffee, an answer to appetite loss

One study suggests that the earlier assumption that our sense of smell depends solely on receptors may not be true as “‘Molecules that look almost identical can smell very different’” [7] and “‘some molecules can smell different—to animals, if not necessarily to humans—simply because they contain different isotopes’” [7]. Therefore, unique molecular structure of such coffee odourants may also be a reason for the detachment of other odourant molecules from receptors and an answer to the strong binding of coffee odourants to olfactory receptors.

Here we suggest that the smell signal from coffee in olfactory receptor proteins is triggered by the vibrations and unique molecular structure of coffee odourants, and perhaps as one study suggests, “‘can encourage an electron to jump between two parts of the receptor in a quantum-mechanical process called tunneling’” [7]. The unique structure of coffee odourant molecules probably provide a strong binding opportunity for the coffee odourants to the olfactory receptors and therefore such movement and vibration of coffee can lead to detaching previously bound molecules from receptors. This, in turn can stimulate appetite by sending signal to the brain.

Use of coffee in animal studies

Having healthy animals is an important aim in animal research studies. We think coffee smell can be used to keep animals healthy by stimulating their appetite and salivary flow. In some studies, animals need to be fasted for certain hours and coffee could be used to stimulate their salivary flow for obtaining better saliva collection [8]. Such studies need to be done on animals to see whether coffee smell increases their salivary flow and appetite.

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References

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