

## CLASS ASSIGNMENT: FUTURE FOODS - 3/9/2021

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**Problem:** There have been rapid advances in neuroimaging techniques that enable scientists to see which regions of the brain are being stimulated when people do particular things, like eating certain foods.

### **Assignment:**

Imagine you are a new professor at UMASS and you want to work with an expert in brain imaging methods in the Psychology department. Design a project that you would work on together that is about food. This could be an idea for a new grant to the USDA or NIH

Grant for the NIH

Topic: (Key Words)

**Aphrodisiac foods** - alternatives? - plant based foods). Is there a difference in the way your brain responds to plant based vs animal based foods?

Brain imaging, Pleasure centers, Mood boosting foods and its effects on Brain Chemistry, foods

Target Groups/Audience-

1. Young people ( ages- 18-30)
2. Women ( mid 40s to late 50s - close to or in Menopause)
3. People suffering from degenerative diseases.

### **Methods:**

Developments for Brain Imaging of Human Sexual Response To Foods considered to be aphrodisiac

Foods:

Plant based

- artichokes
- asparagus
- chocolate
- figs
- spicy chili peppers
- strawberries
- watermelon

Animal based

- oysters

### **Health benefits:**

This could act as an alternative to medication or alternative to hormone replacement for women in menopause-

Aspects of a grant proposal

### **Statement of Need:**

Sexual activity is considered an important factor of quality of life, the reason why sexual dysfunction altering not only women who suffer from it, but also the lives of their partners, their desire to form a family, and their relationship in general (Nazari et al., 2020).

Several factors are associated with the suffering of sexual dysfunction in women, such as

hormonal alterations in the menopausal stage, psychological effects of diseases such as multiple sclerosis, side effects of anticancer treatments, among others.

Between the several types of sexual dysfunction, it is found the hypoactive sexual desire disorder is the the most common sexual problem in women, arinsing 30% of prevalence (Brauer et al., 2012). Treatment fo HSDD includes sexual therapy and medication, however many of the medical drugs approved by the FDA to treat hypoactive sexual desire disorder (HSDD) are not approved for use by post-menopausal women.

Post-menopausal women tend to have more health complications such as heart disease or diabetes and there for could react negatively to these drugs designed to treat HSDD. This leaves post-menopausal with few options to treat HSDD and could greatly impact an important aspect of their lives. If aphrodisiac foods could produce the same results as Flibanserin to treat HSDD then this could provide an alternative with little to no side effects.

#### **Project Narrative/Goals:**

The goal of this study is to test whether or not aphrodesiac foods can have the same affect as Flibanserin to treat post-menopausal women with hypoactive sexual desire disorder (HSDD). "Flibanserin (Addyi, Sprout Pharmaceuticals) is a multimodal serotonergic agent that was originally developed by Boehringer Ingelheim for the treatment of major depressive disorder.

Flibanserin was unsuccessful in clinical trials for treating depression, but was reported to have the side effect of increased libido in female patients." (1) In order to test this we plan on having one group of post-menopausal women take Flibanserin, one group eat an aphrodisiac food, and the last group do nothing (the control group). Each subject from each of the groups would then undergo a Magnetic resonance imaging (MRI) scan to see which parts of the brain are being activated. The scans from the Flibanserin group, aphrodisiac food, and control group would then be compared. In terms of measuring changes in functional neuroanatomy, PET and fMRI can both be made sensitive to the haemodynamic responses, i.e. make measurements of changes in blood flow, volume and oxygenation. These are in turn linked in yet to be determined ways to actual neural activity in the human brain. Functional neuroimaging offers a platform to register brain activity online, i.e. while subjects are engaged in some aspect of the sexual pleasure cycle.

Using neuroimaging techniques to study the sexual brain involve major ethical and technical challenges. The lack of ecological validity of the scanner environment is a major obstacle.

Cocoa-derived products, like chocolate, represent a panacea for mood and affectivity.

Polyphenols present in chocolate exert an elevated antioxidant activity and they modulate the immune response. The functional neuroanatomy of sexual behavior is comparable to that involved in processing other rewarding stimuli.

**Budget:** In terms of Budget, we will not be having a major expense as the equipment required for Brain Imaging (MRI, PET Scan) are available in the Psychology Department (our collaborator). We will need to buy enough food samples within the appropriate time, we also will need qualified personnel to conduct this study. Approvals from the University's Ethics Review Board will be required as we are dealing with Human Subjects.

#### **Sources:**

1. English, C., Muhleisen, A., & Rey, J. A. (2017). Flibanserin (Addyi): The First FDA-Approved

Treatment for Female Sexual Interest/Arousal Disorder in Premenopausal Women. P & T : a peer-reviewed journal for formulary management, 42(4), 237–241.

2. Georgiadis, Janniko R., and Morten L. Kringelbach. "The human sexual response cycle: brain imaging evidence linking sex to other pleasures." *Progress in neurobiology* 98, no. 1 (2012): 49-81.
3. Silva, Tânia, Mariana Jesus, César Cagigal, and Carla Silva. "Food with influence in the sexual and reproductive health." *Current pharmaceutical biotechnology* 20, no. 2 (2019): 114-122.
4. Fusar-Poli, Laura, Alberto Gabbiadini, Alessia Ciancio, Lucia Vozza, Maria Salvina Signorelli, and Eugenio Aguglia. "The effect of cocoa-rich products on depression, anxiety, and mood: a systematic review and meta-analysis." *Critical Reviews in Food Science and Nutrition* (2021): 1-13