PhD fellowship ANSES (2021-2024)

Effects of radiofrequency (5G) in healthy and depressive subjects: a behavioral and neurobiological approach of electromagnetic hypersensitivity (EHS) in the Rat

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The exponential develoment of information/communication technologies involves new radiofrequency (RF) signals that have not yet been investigated concerning their potential impact on human health. This is particularly true for frequencies above 6 GHz as proposed by the upcoming 5G technology. This leads the general population to worry about such technologies, and particularly electromagnetic hypersensitive (EHS) subjects. Indeed, EHS subjects show various symptoms including anxiety, depression, memory complaints, sleep alteration, pain etc… and they attribute their health problems to their exposure to RF. So far, there is no scientific evidence to support the role of RF in this auto-diagnosed syndrome, and no data are available to decipher if symptoms are the cause and/or consequence of EHS. The aim of this project is to better understand this idiopathic environmental disease and its relationship to RF exposure using a validated animal model of depression. The Flinders Sensitive Line (FSL) rats is a well-known model of depression : FSL rats show a strong behavioral/ physiological/neurochemical phenotype (homology and isomorphism) as well as anti-depressant drug responses (predictivity). In addition, EHS and depression/anxiety/somatic complaints mostly concern women (sex:ratio 2 :1 for the latter). The project proposes to study in both male and female rats, the effects of RF signals of the 5G technology using 2 frequencies, 900 MHz and 26 GHz : the low frequency penetrate inside living organisms, while the high frequency does not (skin exposure). RF exposure will be performed in a reverberant chamber over 6 weeks. Behavioral studies will include tests targeting i) short- and long-term memories and behavioral flexibility, and ii) neophobia, anxiety, depression, social interactions and nociception/analgesia. Finally, cerebral plasticity (volume, dendritic arborization and spines) will be assessed in key areas involved in memory and affective/emotional states, i.e., hippocampus, amygdala, prefrontal, entorhinal and insular cortices. This project is a first proposal of an animal model of EHS and should bring new knowledge about the role of affective/emotional states in the development and/or maintenance of this syndrome.

Candidate profile *:* Master 2, if possible in Neuroscience with previous experiences in rodent's handling. Knowledge in neurobiology, if possible in cognitive neurosciences and rodent's behavior, are required.

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- Motivation letter

- CV

- Master's degree transcripts and ranking

- letter of recommendation