**Exercise 4 : Electrophysiology – Signal preprocessing**

**Context :**

You have a signal from Local Field Potential recording in brain grey matter. You have 2 electrodes named e1 and e2. Signal is sampled at 2048 Hz and the signal is in μV.

**Instructions :**

1. **Data Exploration :**
   * Load the signal
   * Do a bipolar derivation to crμμeate one signal
2. **Descriptive Analysis :**
   * Apply high-pass filter at 4 Hz and low pass at 100Hz
   * Compute the Power spectrum with welsh method
   * Compute the time-frequency decomposition with tfr\_array\_morlet decomposition with logspace frequency domain between 4 and 100 Hz.
   * Baseline the time-frequency decomposition with the average of each frequency points
3. **Visualization :**
   * Plot raw signal
   * Plot bipolar derivation
   * Plot Power spectrum
   * Plot the time frequency decomposition baselined

**Packages :**

import pandas as pd

import numpy as np

from scipy import signal

import seaborn as sns

import matplotlib.pyplot as plt

from mne.time\_frequency import tfr\_array\_morlet

from scipy.ndimage import gaussian\_filter

**Outputs :**

**Une image contenant texte, Tracé, ligne, diagramme

Description générée automatiquement**