SEMINAR

V | LF Spiro3D

Low and very-low-field 3D magnetic resonance spirometry for advanced regional exploration of respiratory diseases

Of bridges and sighs

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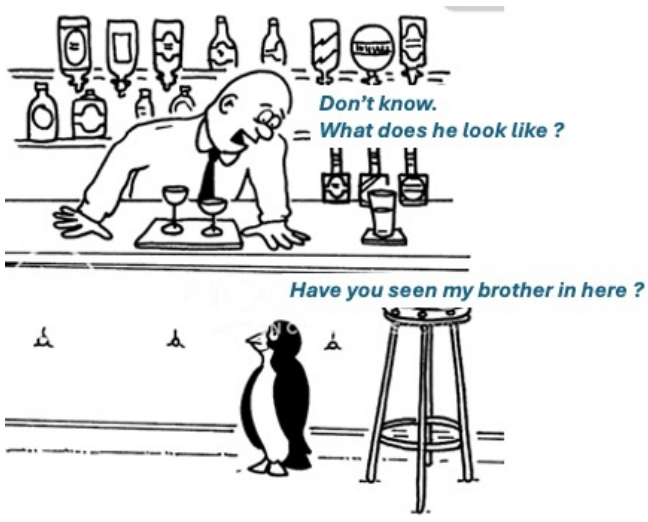
Physical Salle de conferences – UPSaclay

BioMaps – SHFJ – 4 place du general Leclerc, Orsay, France

Digital Conference Room here

Human ventilatory activity is cyclical by definition, but that does not mean it is regular. Underpinned by a tangle of interactions between several neuronal oscillators located in the brain stem, it has the characteristics of a complex or pseudo-chaotic system. Each ventilatory command corresponds to a specific trajectory within a basin of attraction that can be described by three-dimensional phase portraits. When we observe the system at its extremity, by measuring ventilatory flow for example, this central neurological complexity translates into peripheral mechanical complexity, resulting in cycle-to-cycle variability in the descriptive parameters of ventilation (tidal volume, period, inspiratory time, expiratory time). The translation of central complexity into peripheral complexity depends on the mechanical state of the respiratory system, or, more precisely, on the balance between its mechanical impedance and the capacity of the respiratory muscles to mobilize it. The sicker the respiratory system, the more central variability is "filtered", and the less peripheral variability is observable, with perhaps a perceptual consequence (it is possible that the brain needs a certain degree of variability to be "calm", and that it "worries" when all cycles are similar, a worry that can translate into respiratory discomfort). These phenomena are fairly well established in cases of respiratory pathology. But what about the physiological state? A matter of bridges and sighs?



More information: www.v-lf-spiro3d.eu

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