

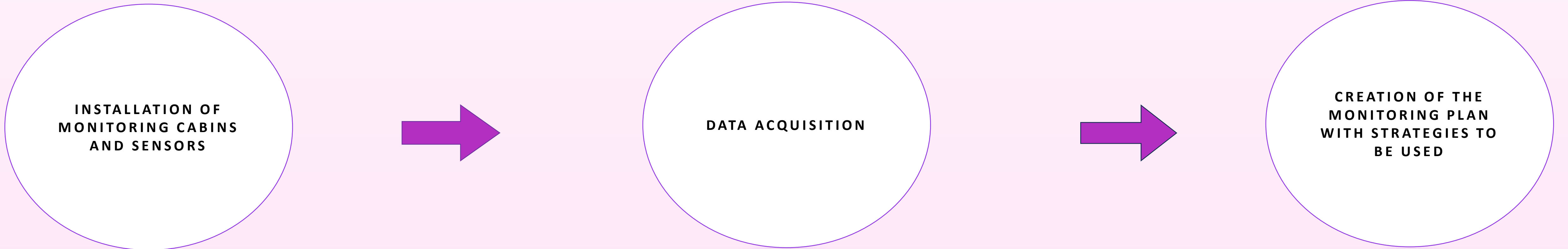
# Corso di Dottorato di Ricerca in Scienze della Vita e dell'Ambiente, Ciclo XXXIX

## "WEB PLATFORM FOR DISPERSION MODEL IN ORDER TO ASSESS THE IMPACT OF EMISSIONS GENERATED AT THE WASTE TREATMENT AND DISPOSAL PLANT"

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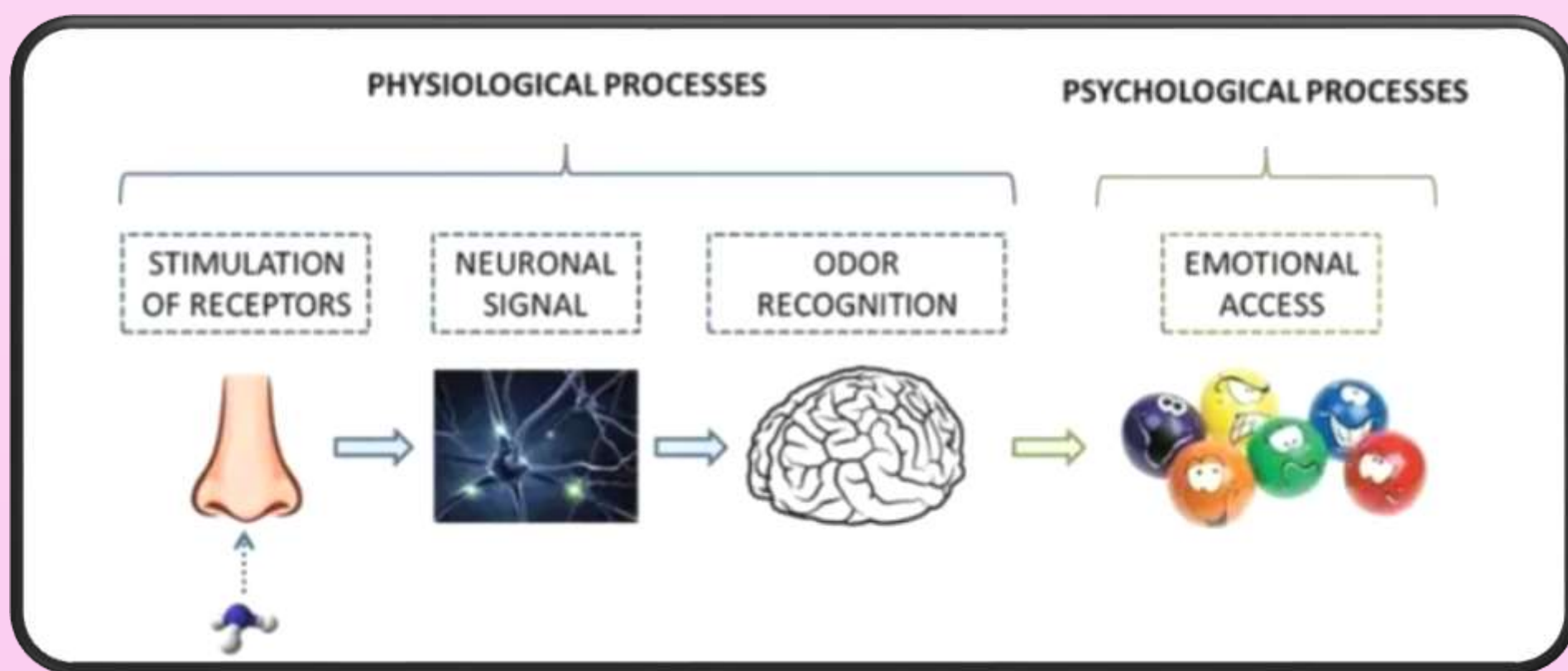
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OBJECTIVES

- ✓ To position and use of odour measurement sensors in a landfill site to reduce emissions in the nearby city centre
- ✓ To acquire data from odour measurements and limit values from waste processing through the use of air monitoring cabins installed in the vicinity of the landfill site

Task	First year (2023-2024)										Second Year (2024-2025)										Third Year (2025-2026)														
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Literature analysis	[Yellow bar]																																		
Installation of odour sensors											[Green bar]																								
Odour measurement											[Yellow bar]										[Yellow bar]														
Odour data verification											[Yellow bar]										[Yellow bar]														
Quality control											[Orange bar]										[Orange bar]														
Data chemometric treatment											[Grey bar]										[Grey bar]														
PM10 monitoring											[Green bar]										[Green bar]														
Metal analysis											[Blue bar]										[Blue bar]														
Source apportionment																					[Orange bar]														
Air-mass backtrajectories analysis																					[Blue bar]														
Citizen results dissemination program											[Blue bar]										[Yellow bar]														
Paper publications											[Blue bar]										[Blue bar]														
Thesis redaction																					[Red bar]														



-Odour is the property of a substance, or rather a mixture of substances, dependent on their concentration, capable of activating the sense of smell and triggering the sensation of odour (Brennan, 1993; Belgiorno et al., 2009)-

### What is odour?

- defined by ISO5942:2008 -> organoleptic attribute perceptible by the olfactory organ (including nerves) by sniffing various volatile substances.  
And its presence and continuous permanence in the atmosphere, leads to an increase in atmospheric pollution defined as: any modification of the atmospheric air, due to the introduction ... of one or more substances ... such as to impair or constitute a danger to human health or the quality of the environment ... or compromise the legitimate uses of the environment. (D.Lgs 152/2006 as amended).



### How to find out the presence of odours?

Olfactometric analyses: consider the reference standard UNI EN 13725:2004 -> evaluation of odour emission with dynamic olfactometry and that of odours from point sources, areal sources with outward flow and areal sources without outward flow.

### Which instruments to use?

Air monitoring cabins  
EDA 2000 software-> real-time and continuous data acquisition  
Monitored parameters: NH<sub>3</sub> and H<sub>2</sub>S (mg/m<sup>3</sup>)-> responsible for odorous emissions from waste processing  
Unit of measurement: European odorimetric unit (EUO) the quantity of odorant(s) which, when evaporated in 1 m<sup>3</sup> of neutral gas under normal conditions, provokes a physiological response (detection threshold) from a test group equivalent to that provoked by a European reference odour mass (EROM), evaporated in 1 m<sup>3</sup> of neutral gas under normal conditions.



### Future perspectives:

- Chemical-physical study of the odorous measurements described in the prerequisites, in compliance with the legislation updated to 2023;

-Creation of an efficient and promptly updated dispersion model of the odorous substances released into the atmosphere, in which the characteristics of the emissions relative to the sources, the meteorological data of the specific areas under examination and the relative gas concentration data must be considered;

-Guide lines to set up a monitoring plan for odour emissions;

-Involving citizens in reporting odours in the city to ensure an improvement of urban air quality.