

Course: Neurotoxicological Analysis

Lecturer: G. Calamandrei

Date: 3/07/2017- 7/07/2017

Classroom: 1-15 @IUSS

Course schedule

Week	Date	Lecture hours From To	Tutorial hours From To	Subject	Tot h
1	3/07	14-18		Brain development: gene, environment and critical periods Measuring behaviour in the laboratory and in clinical studies	4
	4/07	10-13	14-18	Reference values for developmental neurotoxicity The methods of behavioural toxicology: strength and weaknesses of laboratory and epidemiological studies	7
	5/07	10-13	14-18	Developmental neurotoxicity: heavy metals	7
	6/07	10-13	14-18	Developmental neurotoxicity: pesticides	7
	7/07	10-13	14-16	Developmental neurotoxicity: Persistent organic pollutants and endocrine disruption	5

Brief Contents Description and Course Syllabus:

1) Brain development: gene, environment and critical periods

Fundamentals. How the brain develops, from conception to old age

The concepts of plasticity, vulnerability and resilience: gene x environment interaction. The etiology of neurodevelopmental disorders

2) The methods of behavioural toxicology

Measuring behaviour and developmental neurotoxicity

Reference values

Laboratory studies: strength and weaknesses

Epidemiological studies: strengths and weaknesses

3) Developmental neurotoxicity: heavy metals

The paradigmatic case of mercury: explaining conflicting results in large cohort studies

Genes predispose to adverse effects of mercury?

The controversial effects of metalloids: toxicants or essential nutrients?

4) Developmental neurotoxicity: pesticides

The paradigmatic case of the organophosphate insecticides: chlorpyrifos

Laboratory findings and clinical/epidemiological findings: the risks of sub-toxic exposures to pesticides

Gene polymorphisms, fetal exposure to pesticides and the etiology of autism

5) Developmental neurotoxicity: Persistent organic pollutants and endocrine disruption

The adverse health effects of PCBs, dioxins, PBDE

Endocrine disruptors: modifying behaviour by mimicking the action of steroid hormones; gender- and sex-dependent susceptibility to chemicals.