UNIVERSITÀ DEGLI STUDI DI MILANO

D-MEM PhD-UNIMI | Doctorate program Milan EXPERIMENTAL MEDICINE

Role of oxidative stress in the vulnerability for psychiatric diseases and in the mechanism of action of psychotropic drugs

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Rationale and main objectives of this project

It is well known that stressful events during life represent a risk factor for the development or the exacerbation of psychiatric disorders such as major depressive disorder and schizophrenia. However, although these diseases occur in a significant percentage of stress-exposed subjects (stress vulnerability), most of them can successfully cope with the adverse situation and avoid such psychopathologies (stress resilience).
Given the high prevalence of these mental disorders and the unmet needs associated to their pharmacological treatment, understanding the molecular mechanisms underlying the differential stress impact is at the same time a mandatory investigation and a scientific challenge. Indeed, the identification of the molecular alteration associated with stress-vulnerability may represent the target for a corrective pharmacological intervention while the changes observed in stress-resilience should be promoted to maintain good health status.
In recent years, our lab contributed to support the role of immune/inflammatory system in psychiatric disorders by demonstrating its involvement in the differential stress response and in the mechanism of action of psychotropic drugs.
Currently, we are evaluating how the cerebral neuroinflammation observed in different stress-based experimental models of psychiatric disorders may actually affect synaptic functions and our working hypothesis is that oxidative stress might be one of the players.
Accordingly, main goals of the present project will be:

- to evaluate if and how stress-induced neuroinflammation may lead to oxidative stress
- to study the mutual influence between immune/inflammatory mechanisms and mediators of the redox balance
- to investigate if redox unbalance may underlie specific depressive-like phenotypes
- to assess if pharmacological treatment able to normalize depressive-like phenotypes is also capable to modulate redox unbalance.
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