CS06-02 - GENETIC UNDERPINNING OF RESILIENCE

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Experiences and stressful encounters during early development profoundly influence development of the brain to convey either risk for or resilience to later psychopathology. Whereas a considerable proportion of the population will develop stress-related conditions such as anxiety disorders or depression in later life, the majority are resilient, cope with stress and escape such outcomes. The biology for this heterogeneity is multi-factorial, involving a complex interplay between genetic and environmental factors. Although substantial heritability is predicted, recent genome-wide approaches have reliably linked only a few genes to resilience, indicating that also the environment is of critical importance when it comes to developmental processes. It therefore appears that subtle differences in either of these may be responsible for altering developmental trajectories that confer vulnerability or resilience. Current research is providing compelling data that epigenetic processes translating environmental stimuli into changes in expression of established and novel candidate genes play a pivotal role in establishing long-lasting changes in brain function related to resilience. Experiments in rodents and non-human primates reveal that experiences during sensitive periods of development influence DNA methylation patterns of numerous genes. These experience-induced DNA methylation patterns represent stable epigenetic modifications that alter gene transcription throughout the lifespan and promote specific behavioural outcomes. Recent clinical and pre-clinical data suggest that epigenetic differences in various regions of the brain are associated with a range of stress-related psychiatric disorders. Here, an overview is provided of how these epigenetic differences, and hence susceptibility to neuropsychiatric disorders, might arise through exposure to stress during critical periods of development.

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