

Circuit Dysregulation and Rewiring in Alcoholism

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Alcohol use disorder follows a dynamic, relapsing and remitting course, which is accompanied by some lasting and some reversible untoward effects on cognition, postural stability, emotion, and introspection with the possible consequence of limiting ability to maintain sobriety. Neuroadaptation is a mechanism posited to underlie alcohol's cycle of change. Systematic neuropsychological testing together with structural and functional neuroimaging has identified affected selective brain systems contributing to functional impairment. Although cognitive and affective behaviors have traditionally been considered the purview of the supratentorium, our studies provide converging support for the assertion that regional cerebellar pathology can also disrupt higher-order functions in addition to disturbing gait and balance. Together, these controlled studies have identified disruption of frontocerebellar, frontolimbic, and frontostriatal circuitry as unifying biological substrates of the alcoholism syndrome. To the extent that intrinsic functional networks detected while at rest provide relevant contexts to ready selective brain systems for action, knowledge of the integrity of the alcoholic's default systems could provide insight into functions needing retraining and those upon which retraining can be built. (Support: AA010723, AA012388, AA013521-INIA, AA017168, AA017923, AA021697-NCANDA)