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The relationship between social isolation and dementia: A behavioral rodent study

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Some risk factors that can be detected early in adulthood might render a person more susceptible to cognitive decline. It is becoming increasingly clear that social isolation could be such a risk factor for age-related cognitive decline and dementia. Social isolation has been linked to a higher risk in developing dementia in elderly persons. But in our modern society, loneliness is also highly prevalent among adults. In the US range from 25 to 60%, could possibly result in social isolation and thus an increased risk of developing, accelerating or exacerbating dementia pathology and symptoms. Moreover, changes in social interaction and electronic communication are placing an increasing proportion of the adult demographic at risk for loneliness. Given the high prevalence of social isolation, studying the effects of this on mental health is much timely than ever. We found that rodents that were isolated for 4 weeks during adolescence developed a specific dementia-like phenotype compromising both cognitive and non-cognitive domains, compared to socially housed animals. This behavioral phenotype was expressed as reduced investigation of social stimuli and intense aversive responses toward them, such as freezing. Animals also displayed a long-lasting impairment in a memory task. This phenomenon was found to be dependent on proper ventral and dorsal hippocampal synaptic plasticity. Implications for the clinic and therapeutic strategies and interventions are discussed.

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