microRNA profiling: increased expression of miR-147a and miR-518e in progressive supranuclear palsy (PSP).

Abstract:
Progressive supranuclear palsy is a sporadic neurodegenerative disorder. Genetic, environmental, and possibly epigenetic factors contribute to disease. In order to better understand the potential role of epigenetic changes in progressive supranuclear palsy, we investigated whether some microRNAs and their target genes are dysregulated. We analyzed expression of 372 well-characterized microRNAs in forebrains of a total of 40 patients and of 40 controls using TaqMan arrays and SYBR Green quantitative real-time PCR. The exploratory cohort included forebrains from 20 patients and 20 controls provided by the Erasmus Medical Centre in Rotterdam, Netherlands. Confirmatory samples were from Jacksonville, Florida, and from Melbourne, Australia. Both microRNA profiling and SYBR Green quantitative real-time PCR revealed significant upregulation of miR-147 (miR-147a) and miR-518e in the exploratory cohort. Highly increased expression of these two microRNAs was validated in the confirmatory samples. Target genes of miR-147a (NF1, ACLY, ALG12) and of miR-518e (CPEB1, JAZF1, RAP1B) were repressed in patients' forebrains. The results suggest that dysregulation of specific microRNAs contributes to disease by repressing target genes involved in various cellular functions.