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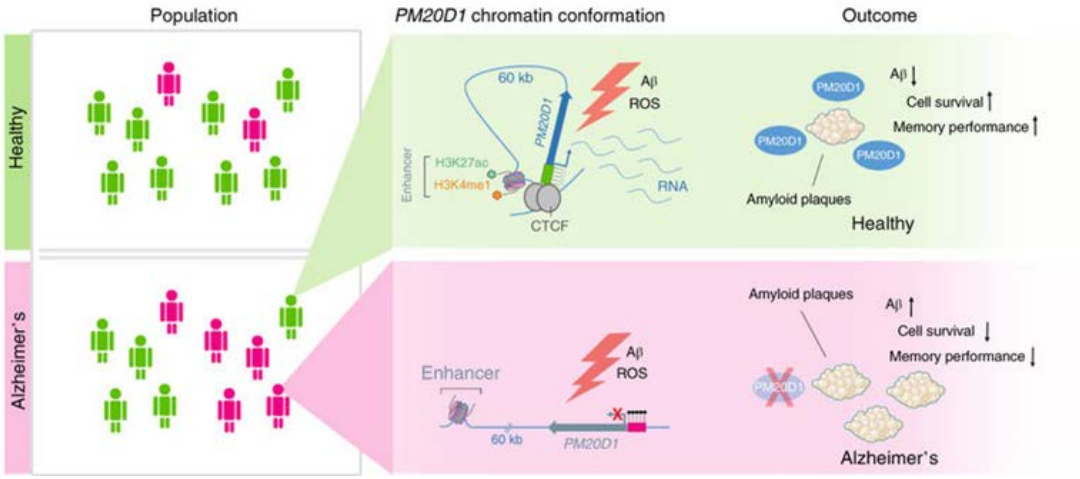
Licensing Opportunity

TTO – Technology Transfer Office

PM20D1 and Alzheimer's Disease



PM20D1 function in Alzheimer's Disease (AD). Left, carriers of methylated PM20D1 (shown in magenta) are more frequent among people at risk for AD (bottom) than in healthy control subjects (top), in whom PM20D1 is unmethylated. Right, in samples from individuals with unmethylated PM20D1 (green box, left; white open circles represent non-methylated CpG sites), an enhancer region (depicted by the nucleosome) 60 kb downstream of PM20D1 physically interacts with the PM20D1 promoter via CTCF binding (gray ovals) and favors PM20D1 transcription. In the presence of AD-related stress (red lightning bolt), such as the presence of reactive oxygen species (ROS) and amyloid fibrils (Aβ), PM20D1 expression is enhanced and found to surround amyloid plaques, to reduce ROS-induced cell death and Aβ levels and to reduce memory impairment (green box, right). In contrast, in samples with hypermethylated PM20D1 (red box; left; black circles represent methylated CpG sites), the promoter region of PM20D1 is not contacted by the enhancer region, PM20D1 transcription does not occur, and there is no protective effect against AD-related pathologies.

Ref. Nr

6.1636

Keywords

PM20D1, SNPs, Alzheimer's disease, epigenetic

Intellectual Property

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Publications

Nature Medicine (2018)
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Description

Therapeutic and diagnostic biomarker for Alzheimer's disease (AD) based on the finding that:

i) the promoter hypermethylation of peptidase M20-domain-containing protein 1 (*PM20D1*) gene and the concomitant repression of its expression strongly associate with AD

ii) The *PMD20D1* hypermethylation is dependent on the presence of single nucleotide polymorphisms in the rs708727–rs960603 haplotypes in cis

iii) *PM20D1* expression is stimulated by neurotoxic insults and its overexpression reduces cell death, decreases Aβ levels and improves cognitive performance.

Advantages

Complementary diagnostic (genetic, epigenetic, proteomic) and therapeutic biomarkers for AD

Status

Validation of biomarkers in human and mouse model for AD

Applications

Diagnosis and prognosis of AD (mAb, gene/SNP marker)

Treatment of AD (small molecules, gene therapy)

Offering

Licensing and/or collaboration