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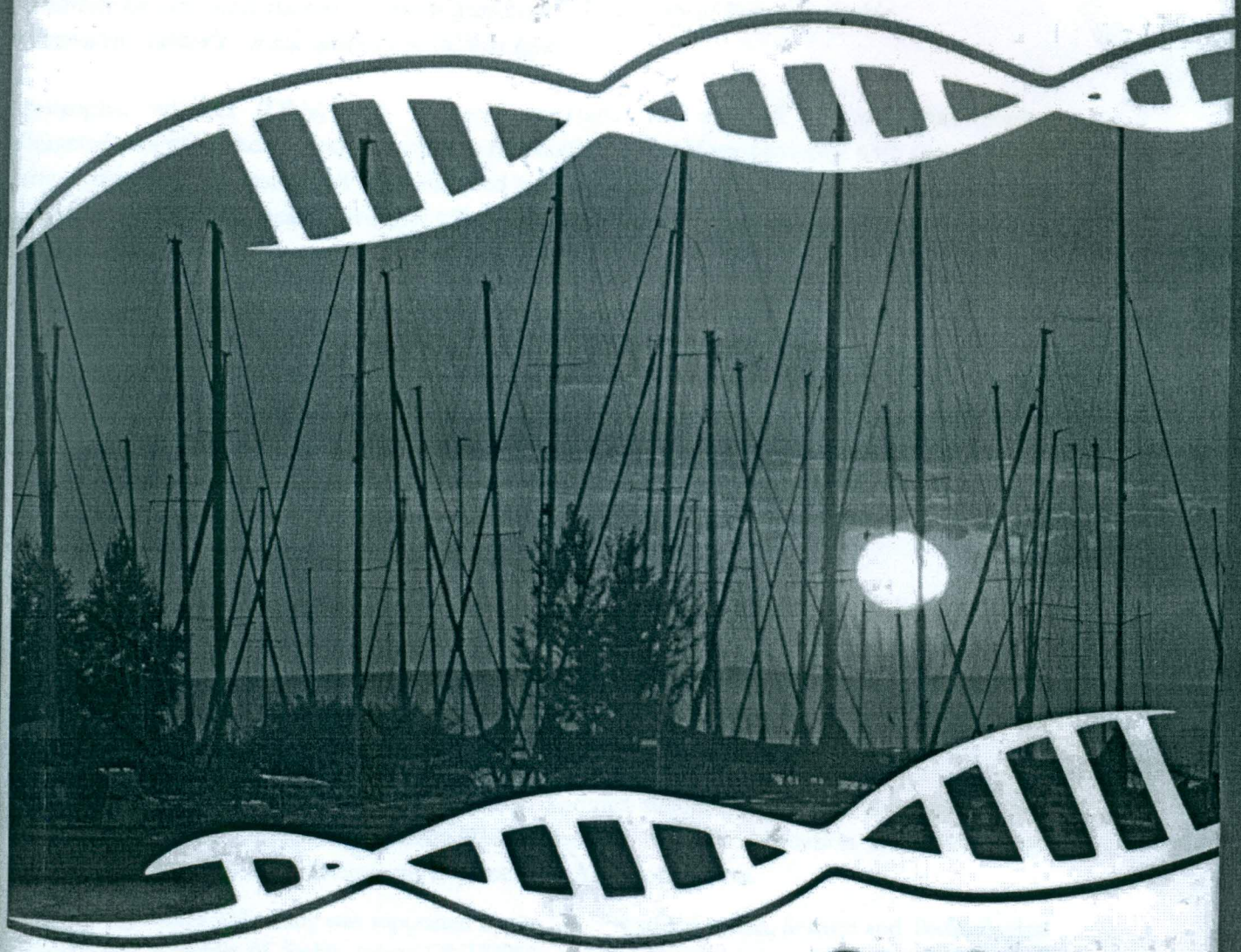

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INFLUENCE OF FISH OIL TREATMENT ON MICROGLIAL CELL BEHAVIOR AND DYSTROPHIC NEURITES IN 5XFAD MICE MODEL OF ALZHEIMER'S DISEASE

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Dystrophic neurites (DNs) and activated microglia are one of the neuropathological characteristics of Alzheimer's disease (AD). Although the use of supplements with omega-3 (ω3) fatty acids has been associated with reduced risk and lessened AD pathology, it still remains elusive whether such a treatment could affect DNs formation and microglia behavior in the early phase of disease.

We examined influence of fish oil treatment on pathological hallmarks in the brain of 5xFAD mice which rapidly recapitulate major hallmarks of AD amyloid pathology. Three-month old female 5xFAD mice received FO (100μl/animal/day) via oral gavage during 3 weeks period. Histological analysis was used to detect changes in pathological features of AD in parietal cortex in 5xFAD mice. ThioflavinS and AmiloGlo were used to visualize plaques. Soluble Aβ peptide, neuritic dystrophy and microglial cells were detect by anti-Aβ42-, anti-SMI31- and anti-Iba-1-antibodies, retrospectively. Immunostaining was observed by confocal microscopy. Quantification was done by Image J program.

Our results showed that short-term FO supplementation is capable of inducing significant decreased of total Aβ levels and preventing the emergence of neuritic dystrophy in parietal cortex of 5xFAD mice. FO supplementation led to increase in overall microglial number and enhanced clustering of microglial cells around amyloid plaques, representing mechanical barrier that doesn't allow Aβ to aggregate.

These results confirmed and extended previous findings suggesting that FO suppresses brain aging and has a typical pleiotropic effect. We believe that FO in combination with other drugs could be good approach for long-term treatment in AD suppression.

Acknowledgement: This study was supported by the Ministry of Education, Science and Technological Development, Republic of Serbia (grant ON173056) and the Fogarty International Research Award, NIH(R03AG046216).