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Alterations of attention and impulsivity in the rat following a transgenerational decrease in dietary omega-3 fatty acids

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Introduction

Polyunsaturated fatty acids (PUFAs) such as ω-3 fatty acids are known to play an important role in neuronal development and functioning of the central nervous system [1,2]. Long-chain (LC) PUFAs such as eicosapentaenoic acid (EPA, C20:5ω-3), docosahexaenoic acid (DHA, C22:6ω-3) and arachidonic acid (AA, C20:4ω-6) exert an influence on numerous neuronal processes through the regulation of membrane fluidity and by modulating synaptogenesis and neurotrophic factor expression, neurogenesis, and neurotransmission [1–3]. Studies in humans indicate that a deficiency in ω-3 fatty acids leads to an imbalance of the ω-3/ω-6 PUFA ratio, affects neurocognitive abilities and is associated with developmental disorders [1,2,4]. In this context, a possible impairment in metabolism of PUFAs has been discussed as a potential risk factor for the development of neuropsychiatric disorders such as major depression,