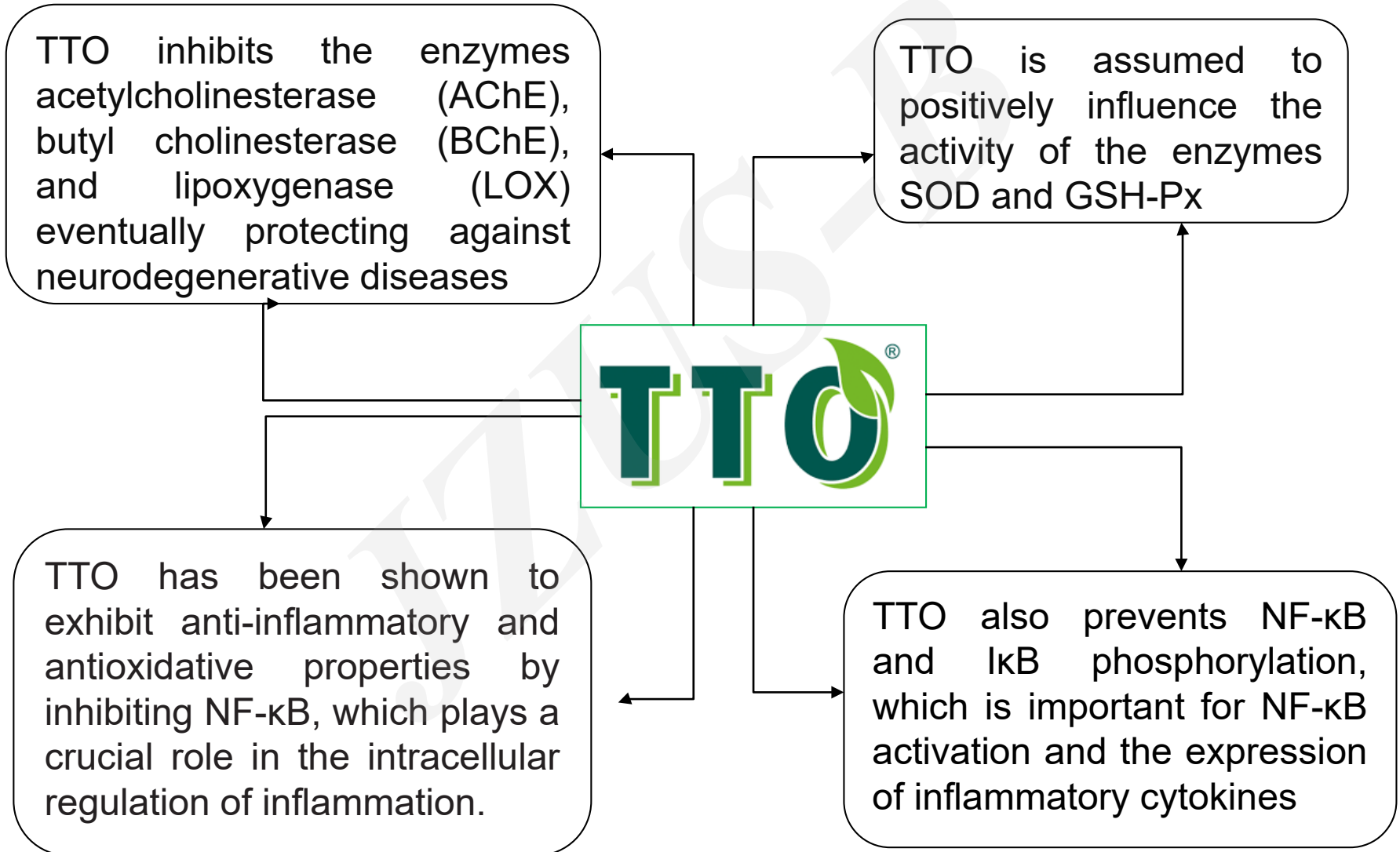


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Tea tree oil, a vibrant source of neuroprotection via neuroinflammation inhibition: a critical insight into repurposing *Melaleuca alternifolia* by unfolding its characteristics

Key words: Tea tree oil; anti-inflammatory; anti-viral; antibacterial and *in silico*, terpinen-4-ol; 1,8-cineole; neuroprotective effect

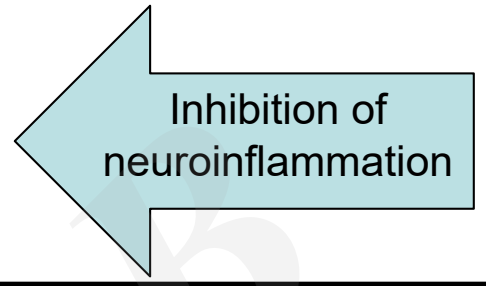
Innovation points



Innovation points

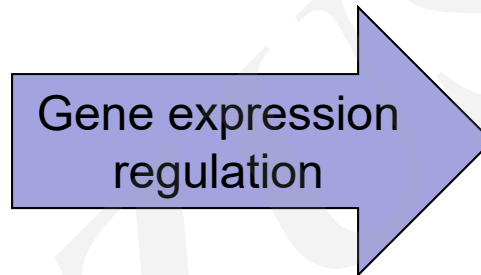
TTO plays significant immunomodulatory role via reducing the production of

- tumor necrosis factor- α (TNF- α)
- interleukin (IL)-1 β , IL-6, IL-10, and prostaglandin E_2 (PGE $_2$) in lipopolysaccharide (LPS)-stimulated macrophages
- Preventing neuroinflammation



TTO regulates a set of genes such as

- SREBP1c, *ACC1* and *FAS* are found to be necessary for fatty acid synthesis and deposition.
- TTO also upregulates the downstream targets (*CPT1A* and *CPT2*) of PPAR α



TTO escalated the mRNA expression of

- Growth acceleration hormone (GH),
- Insulin-like growth factors-I (IGFs-I)
- Heart fatty acid-binding protein (H-FABP)

TTO decreased the mRNA expression of calpain-1 (CAST) and myostatin gene (MSTN)