

## Secondary metabolites from *Umbilicaria Antarctica*: Evaluation of their potential as tau protein inhibitions.

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Alzheimer's disease (AD) is the most common cause of dementia worldwide. To date it is estimated that there are 47.5 million people with this disease and each year 7.7 million new cases, which makes it one of the biggest global health problems are recorded<sup>1</sup>. In AD brains, there are two types of characteristic lesions: senile plaques (SP) consisting of  $\beta$ -amyloid peptide (A $\beta$ ) and neurofibrillary tangles (NFTs), which is composed mainly by molecular protein aggregates hyperphosphorylated tau abnormally.<sup>2-3</sup>

So far, we have demonstrated that polyphenolic compounds have the potential to prevent aggregation of tau in vitro<sup>4</sup>, also we have proven that internal hydrogen bonding between hydroxyl groups of phenolic groups and lysine tau protein are formed once aggregation process (unpublished result) Considering that Antarctic lichens are exposed to low temperature conditions, high levels of ultraviolet radiation, and prolonged periods of darkness, lichens might increase reactive oxygen species (ROS) formation, which leads to believe, that these organisms may contain metabolites with hydroxyl moieties able to stop aggregation.<sup>5-6</sup>

The objective of this work was to determine the effect inhibitory aggregation of tau protein with metabolites isolated from *Umbilicaria antarctica*. Using different chromatographic techniques (reverse phase, size exclusion and HPLC) was isolated from methanol extract four secondary metabolites: tenourin Gyroforic acid, lecanoric acid, and methyl orsellinate (fig.1) which were identified by spectroscopic methods (mainly <sup>1</sup>H-RMN, <sup>13</sup>C-RMN, DEPT 135°, HSQC, HMBC) the effects of those natural molecules on the aggregation of tau protein will be presented and discussed.

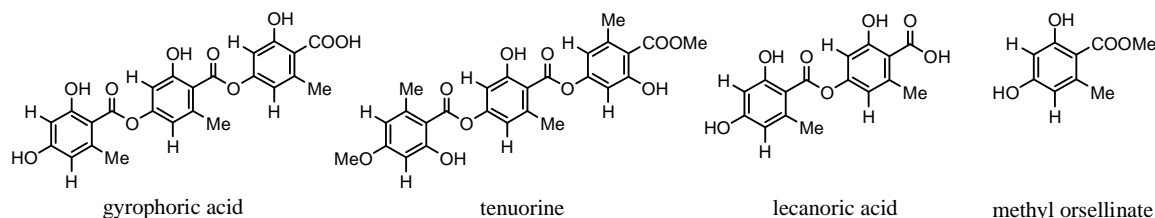


figure 1: Secondary metabolites from *Umbilicaria antarctica*

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