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Antidepressants: New Hypothetical Interactions to Increase Their Efficiency

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Background: Depression is a prevalent disorder that stems from an imbalance in brain chemistry, particularly involving neurotransmitters. It is commonly treated with antidepressants, such as Selective Serotonin Reuptake Inhibitors (SSRIs), which work by inhibiting the reuptake of serotonin. Paroxetine is one of the most commonly used SSRIs; however, it is associated with side effects on both thyroid and sex hormones. The objective of this study is to identify an alternative compound or drug to paroxetine that offers fewer side effects.

Methods: Bioinformatics tools and databases were utilized to analyze interactions of paroxetine and identified a compound that exhibits similar predicted interactions with the serotonin transporter, but fewer predicted interactions with thyroid and sex hormones.

Results: It turns out that there's a similarity in protein sequences among the serotonin transporter, thyroxine, and cytochromeP450 (CYP2D6). Additionally, there is a distinct predicted interaction with paroxetine for these proteins. However, RTI-274, a predicted alternative chemical compound, demonstrates higher specificity according to its predicted interaction.

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Conclusions: Paroxetine has been found to exhibit cross-reactivity, leading to side effects on both thyroxine and sex hormones, as documented in various studies. On the other hand, RTI-274 is a chemical compound that requires further investigation but holds potential as an alternative to paroxetine.

Keywords: Bioinformatics, Depression, Antidepressants, SSRIs, Paroxetine, RTI-274.

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