

Systematic Bioinformatics Review and *In Silico* Analysis of REDOXX®

ABSTRACT

The systematic bioinformatics review and *in silico* analysis of REDOXX® was performed to integrate over 5,000 *in vitro* and *in vivo* laboratory experiments recorded in 122 studies that were conducted across 98 institutions over the past 23 years. The analysis reveals three (3) mechanisms of action involved in anxiety at the molecular systems level in humans. The *in silico* results reveal that seven (7) active ingredients in REDOXX were synergistically efficacious in affecting three (3) biomarkers associated with anxiety.

KEY FINDINGS

1. CytoSolve® *in silico* analysis identified and computationally modeled three (3) major biomolecular processes involved in anxiety:
 - a. Endocannabinoid synthesis
 - b. NMDAR signaling
 - c. Oxidative stress
2. Bioactive compounds in REDOXX were found to have a positive synergistic effect on the three (3) biomolecular processes involved in anxiety.
3. REDOXX alleviated anxiety by increasing endocannabinoid synthesis, downregulating NMDAR signaling, and reducing oxidative stress.
4. The combination of ingredients in REDOXX affect three (3) biomarkers of anxiety, anandamide, intracellular Ca^{2+} and reactive oxygen species, as follows:
 - a. **N-acetyl cysteine** increases anandamide (AEA) production by upregulating the endocannabinoid synthesis pathway in the neurons.
 - b. **Magnesium and thiamine** lower the Ca^{2+} influx into the neurons via downregulating NMDAR pathway.
 - c. **Vitamin A, milk thistle extract, grape seed extract and quercetin dihydrate** lower the reactive oxygen species (ROS) by downregulating oxidative stress pathway.

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