

ABSTRACT

Inflammation is a complex physiological response that plays a crucial role in various diseases, including chronic inflammatory conditions. Natural compounds such as genistein found in soy and pea, have gained considerable attention due to their potential therapeutic benefits. This study aimed to evaluate the anti-inflammatory effects of soy and pea extracts containing genistein and their interaction with TNF-alpha, a key proinflammatory cytokine. The in-silico analysis revealed anti-inflammatory activity of genistein by attenuating TNF-alpha-induced inflammation. Employing *in-vitro* cell line model- based analysis, the extracts and genistein were observed to suppress the activation of NF-κB, a transcription factor crucial for inflammatory responses. Additionally, cell viability assays demonstrated that the treatments did not exert cytotoxic effects on the cells. The present study also highlights the significant antioxidant activity exhibited by soy and pea due to their rich content of bioactive compounds. These compounds have been shown to scavenge free radicals, reducing oxidative stress and potentially preventing various chronic diseases

Key words: Soy, Pea, Cytokines, NF-κB, TNF-alpha, free radicals.

Aims and Objectives

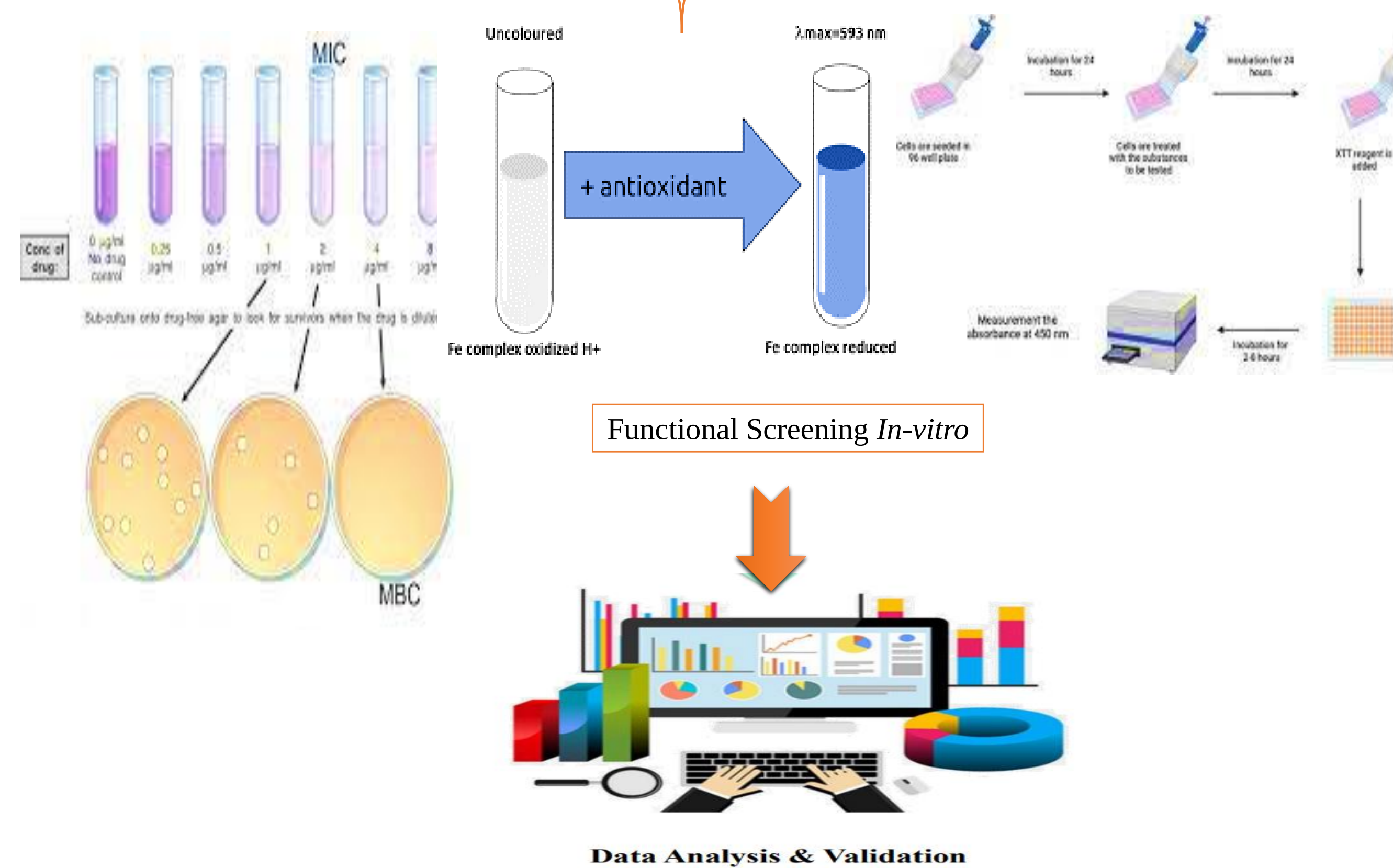
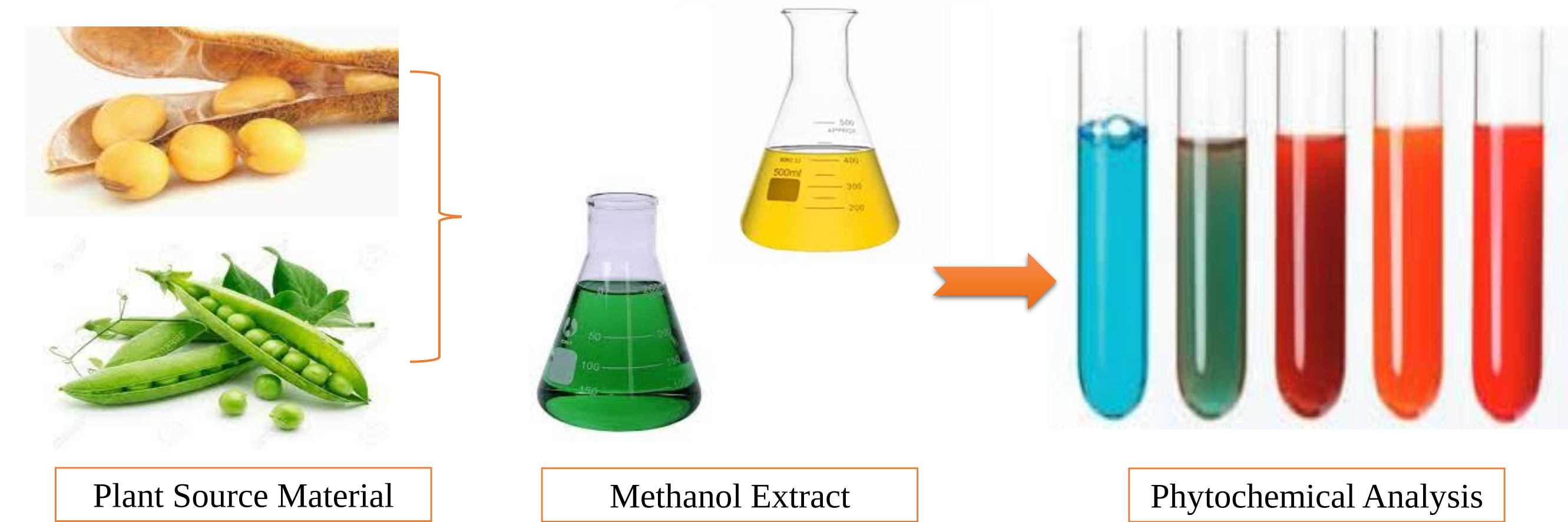
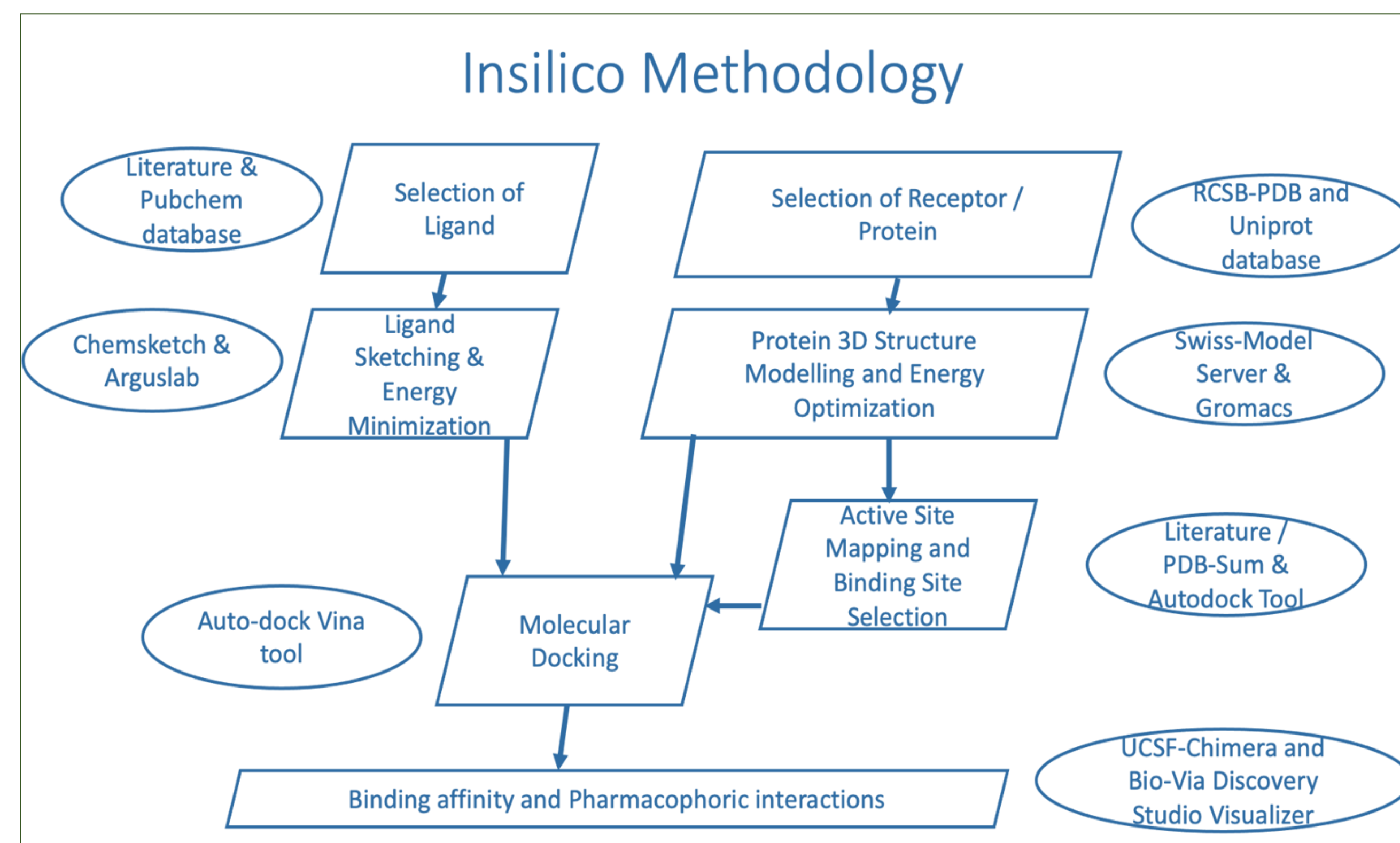
The aim of present study is gauge the medicinal properties of soy (*Glycine max*) and pea (*Pisum sativum*).

The objectives were to

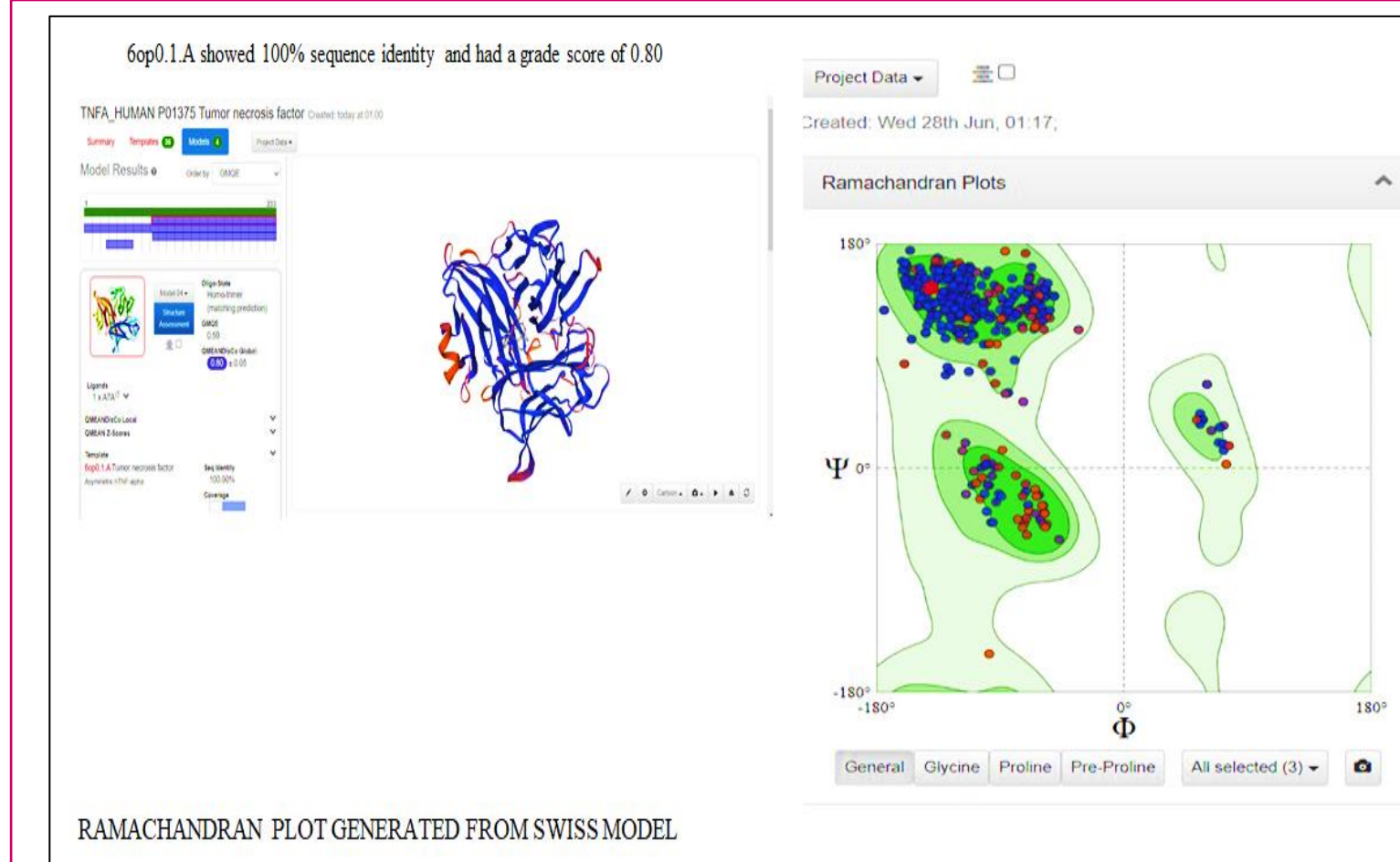
1. Understand the protein structure of the target site and bioactive compound under study
2. An interaction among the receptor and ligand to predict the anti-inflammatory activity of the bioactive compound under study (i.e Geinstein) using bioinformatics software
3. Biochemical screening of the plant extract for quantification of flavonoids, alkaloids and phenols in the same
4. In-vitro screening for anti-oxidant, NO scavenging , Cytotoxicity analysis, protein inhibitory activity, anti-microbial activity
5. Statistical validation

Overall, this thesis aims to contribute to the growing body of knowledge on the medicinal properties of soy and peas

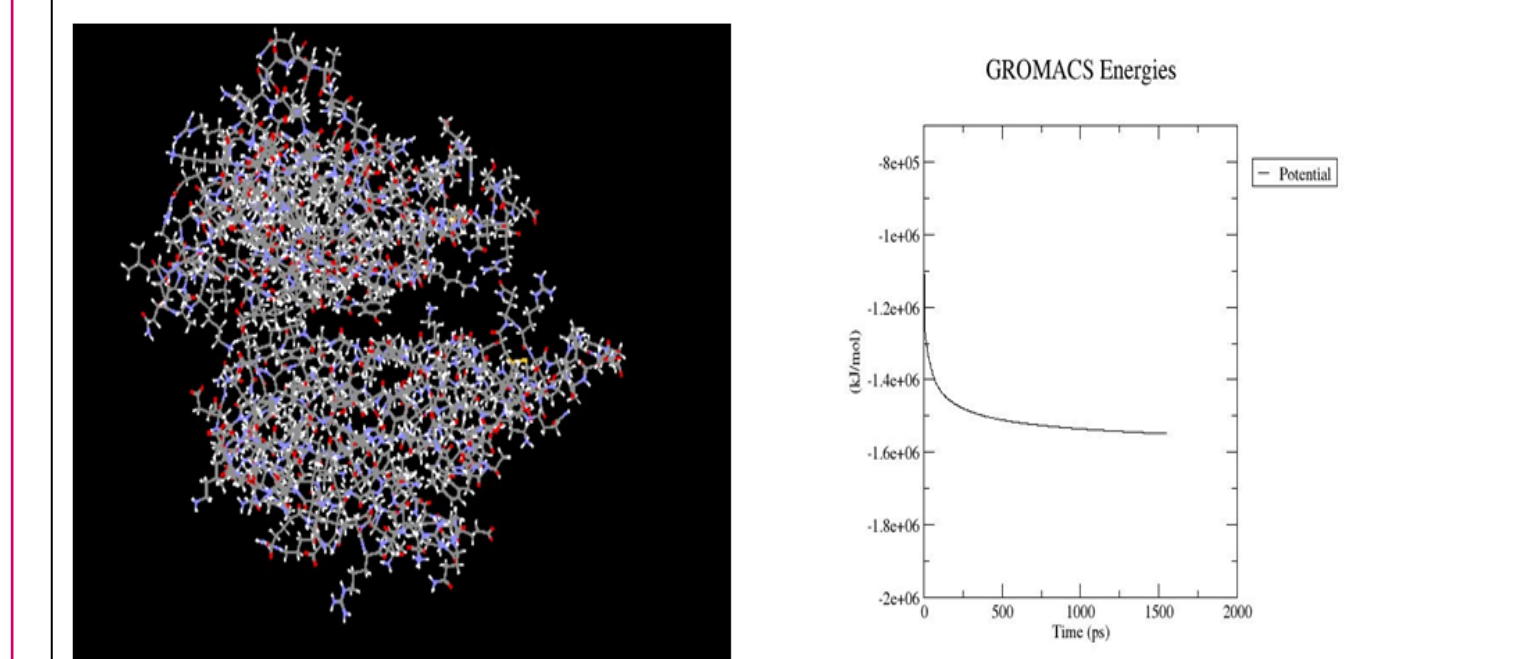
METHODOLOGY



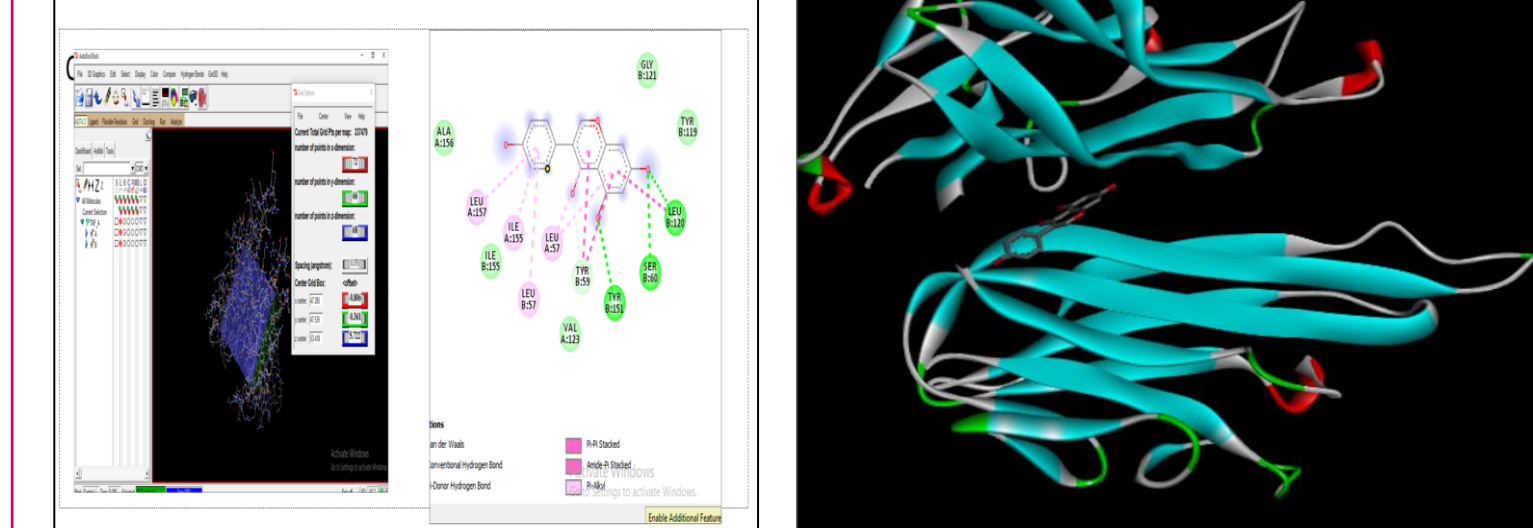
RESULTS



Results for energy minimization of modeled protein



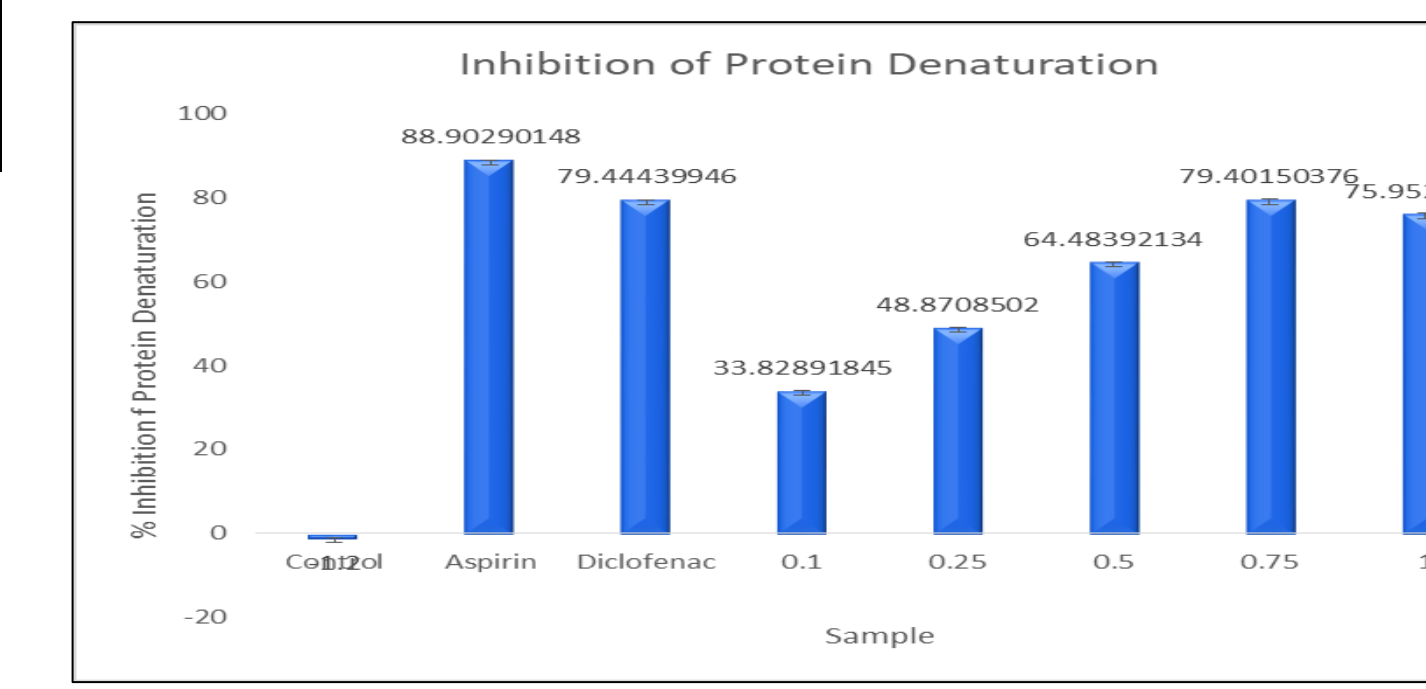
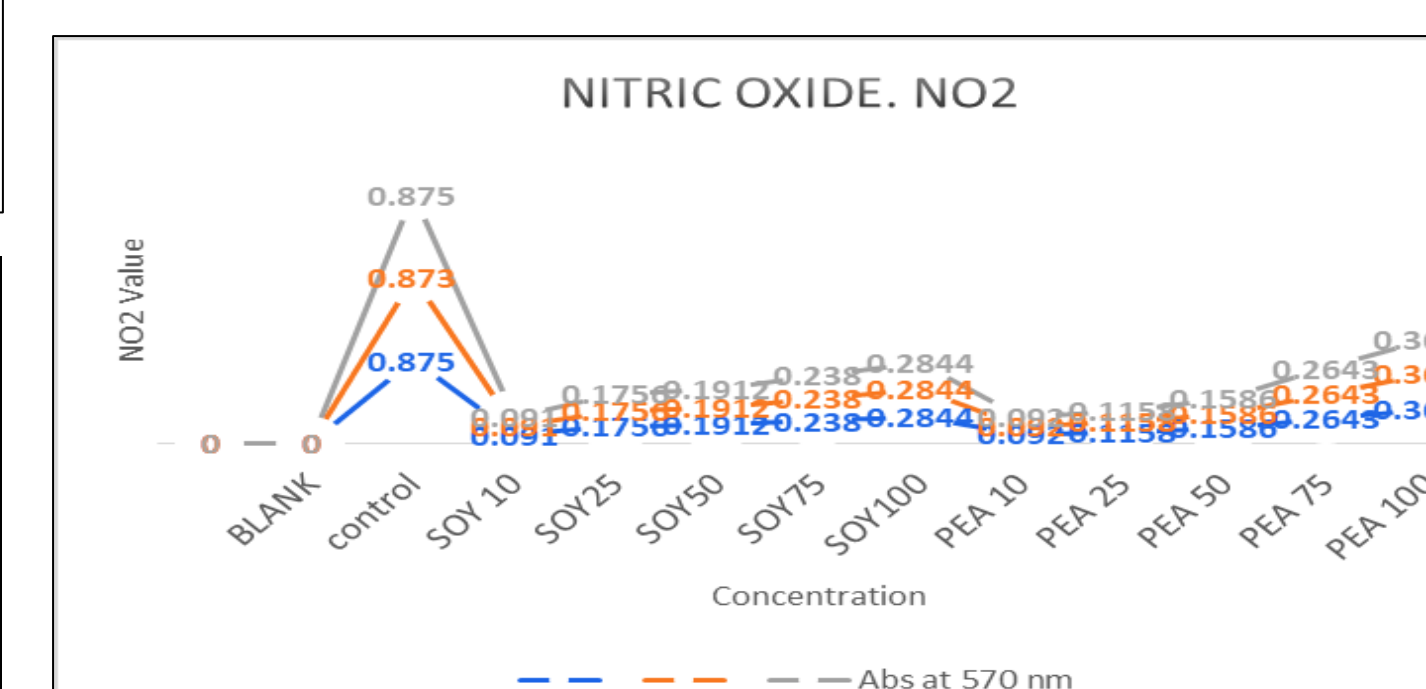
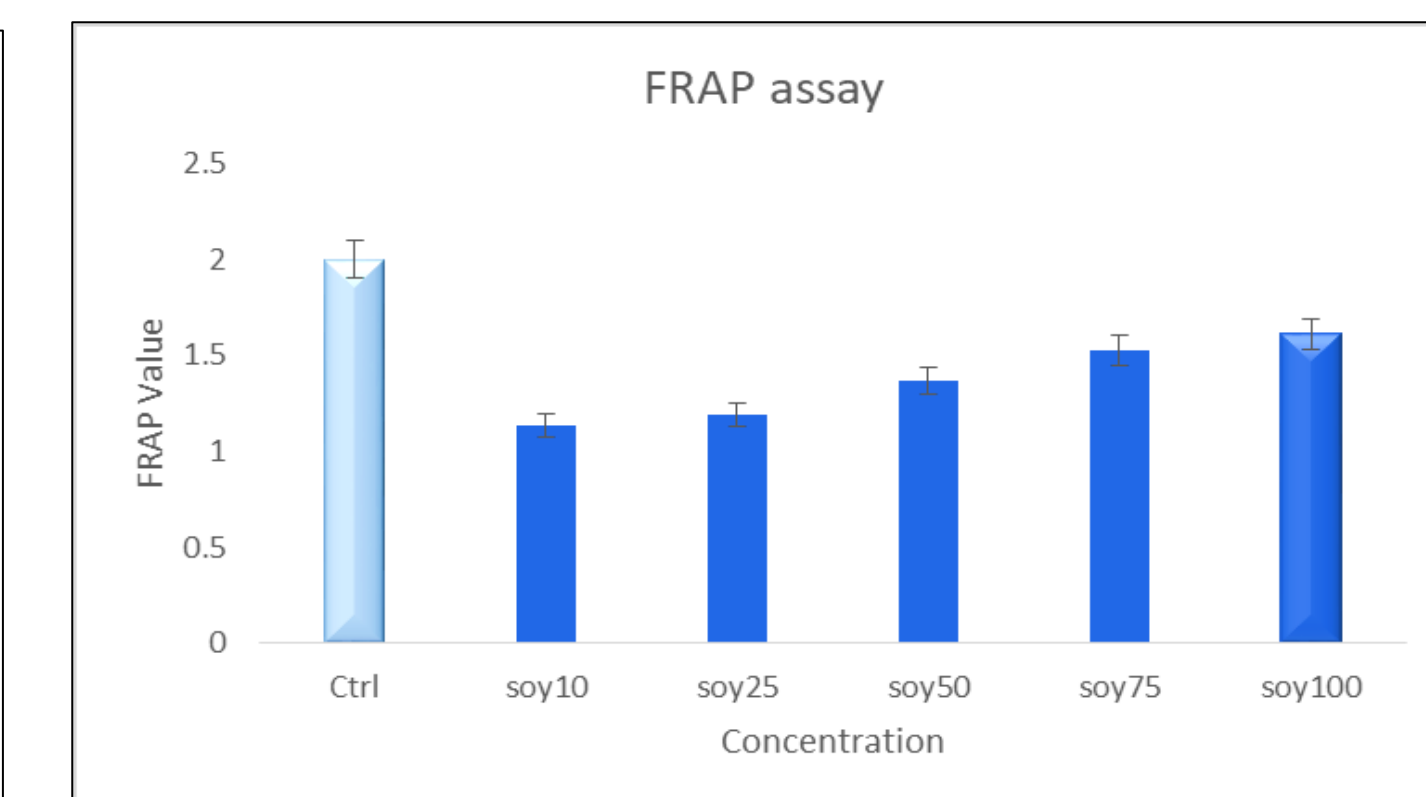
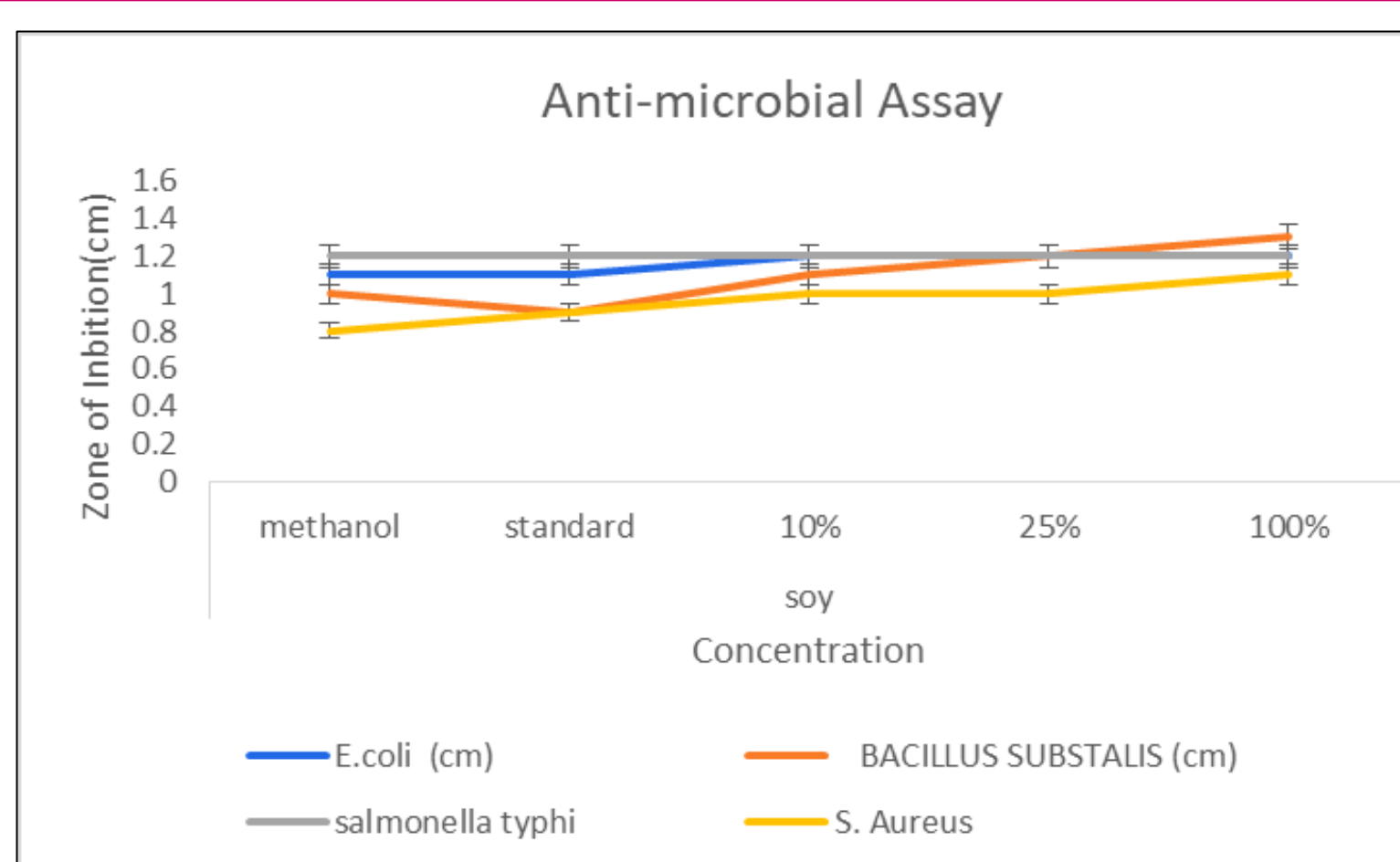
Binding site region selection using AUTODOCK TOOL and Docking using AUTODOCK VINA TOOL



MolProbity Results

MolProbity Score	1.27
Clash Score	2.13
Ramachandran Favored	95.84%
Ramachandran Outliers	0.23%
Rotamer Outliers	1.33%
C-beta Deviations	3
Bad Bonds	1 / 3562
Bad Angles	30 / 4897

In-silico analysis



In-silico analysis

Conclusion

- ⌘ A concentration-dependent inhibition of protein denaturation by both the SOY AND PEA extracts.
- ⌘ The presence of phytochemicals, omega-3 fatty acids, high-quality proteins, and fiber contributes to their anti-inflammatory properties.

References

- ⌘ Hymowitz, Theodore (August 9, 1995). "Evaluation of Wild Perennial Glycine Species and Crosses For Resistance to Phakopsora". In Sinclair, J.B.; Hartman, G.L. (eds.). *Proceedings of the Soybean Rust Workshop*. Urbana, IL: National Soybean Research Laboratory. pp. 33–37.
- ⌘ ^ Newell, C.A.; Hymowitz, T. (March 1983). "Hybridization in the Genus Glycine Subgenus Glycine Willd. (Leguminosae, Papilionoideae)". *American Journal of Botany*. 70 (3): 334–48. doi:10.2307/2443241. JSTOR 2443241.
- ⌘ ^ Heuzé V, Tran G., Giger-Reverdin S., Lebas F., 2015. Perennial soybean (*Neonotonia wightii*). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. <https://www.feedipedia.org/node/293> Last updated on September 30, 2015, 15:09