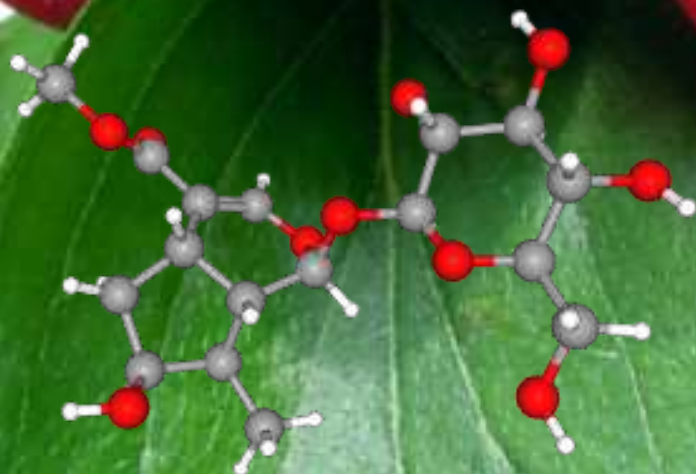


Evaluation of human DPP III inhibition by Cornelian cherry (*Cornus mas*) extracts

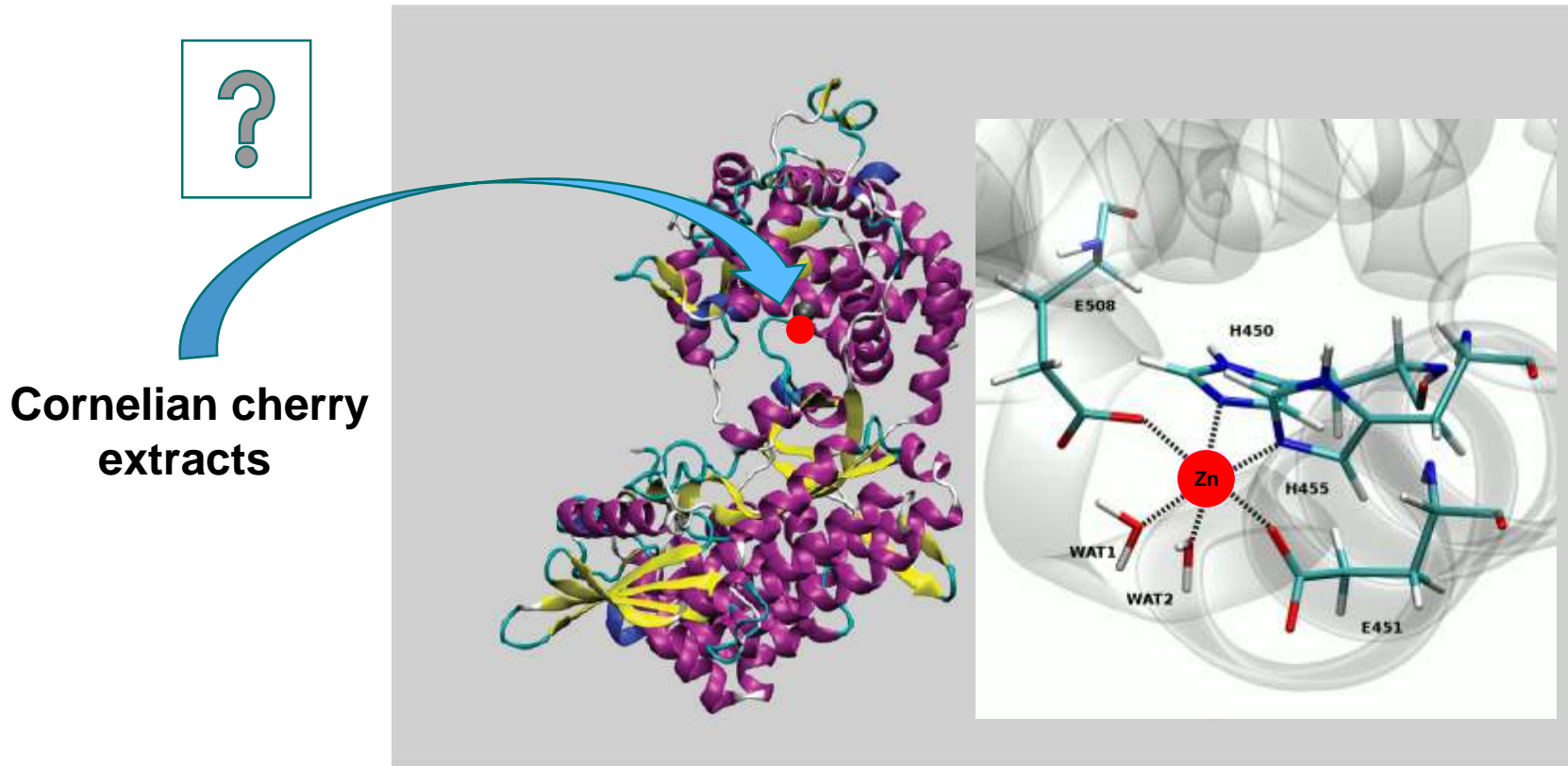
Dejan Agić, Faculty of Agrobiotechnical Sciences Osijek



Working Meeting of the BioRe project, IRB, Zagreb, Croatia

OBJECTIVES

- Using *in vitro* and *in silico* methods to evaluate potential inhibitory activity of Cornelian cherry extracts towards human DPP III



MATERIALS AND METHODS

➤ enzyme activity measurements and % inh. determination

- C-terminal His-tagged recombinant human DPP III (3.4 nM)
- Tris/HCl buffer, pH 7.4 (50 mM)
- Cornelian cherry extracts (25 µg/mL)

preincubation 1 min 25 °C + 3 min 37 °C

Arg-Agr-2NA (40 µM)

incubation 15 min 37 °C

Fast blue B salt → $A_{530\text{nm}}$



$$\% \text{ inh.} = \frac{\text{normal activity} - \text{inhibited activity}}{\text{normal activity}} \times 100$$

MATERIALS AND METHODS

➤ **Cornelian cherry extracts preparation**

Extraction method A:

Tissue (fruit) liofilization → homogenization and extraction in 50% EtOH → evaporation → resuspension in water

Extraction method B:

Tissue (fruit) homogenization and extraction in 70% EtOH

Extraction method C:

Tissue (fruit) homogenization and extraction in water

➤ **HPLC-MS analysis of Cornelian cherry extracts**

➤ **Docking study (AutoDock Vina 1.1.2)**

- iridoids, anthocyanins and hydroxycinnamic acids docking into „open” form of human DPP III (PDB code 3FVY, resolution 1.9 Å)

RESULTS

Extraction method	A	B	C
sample (25 μ g/mL)	DPP III inhibition (%)		
1	30.90	28.51	77.19
2	12.30	29.82	77.99
3	6.94	33.57	71.93
4	29.19	33.87	74.80

Extraction method A: Tissue liofilization → homogenization and extraction in 50% EtOH → evaporation → resuspension in water

Extraction method B: Tissue homogenization and extraction in 70% EtOH

Extraction method C: Tissue homogenization and extraction in water

RESULTS

➤ The most common compounds in Cornelian cherry extracts:

Loganic acid	Loganin	Cornuside	Cyanidin 3-galactoside	Pelargonidin 3-galactoside	Caffeic acid	Coumaric acid derivative 3p/4p	Chlorogenic acid
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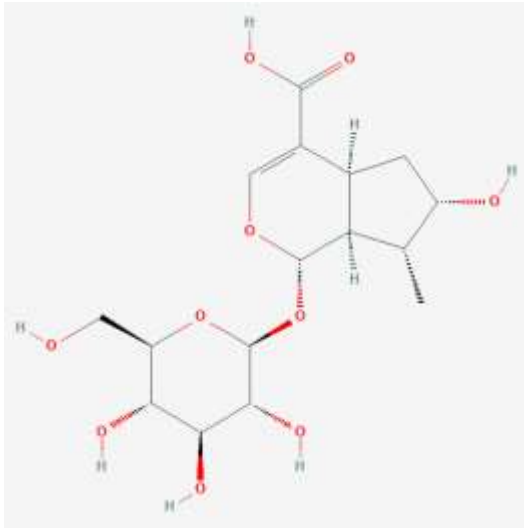
iridoids

anthocyanins

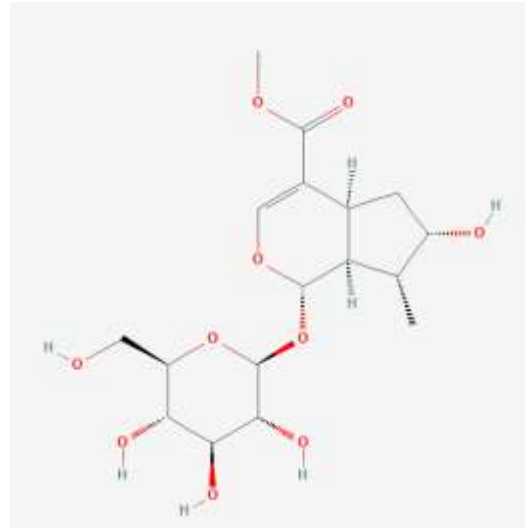
hydroxycinnamic acids

➤ Binding energy (best docked pose)

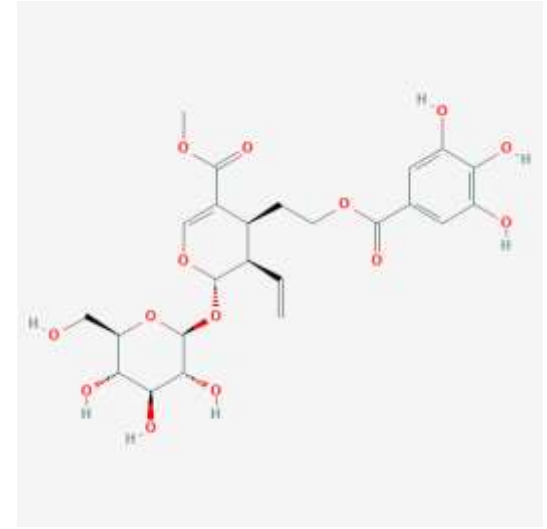
	Loganic acid	Loganin	Cornuside	Cyanidin 3-galactoside	Pelargonidin 3-galactoside	Caffeic acid	Coumaric acid derivative 3p/4p	Chlorogenic acid
3FVY Kcal/mol	-7.3	-6.8	-8.4	-7.8	-7.1	-6.2	-7.6/-8.6	-7.7



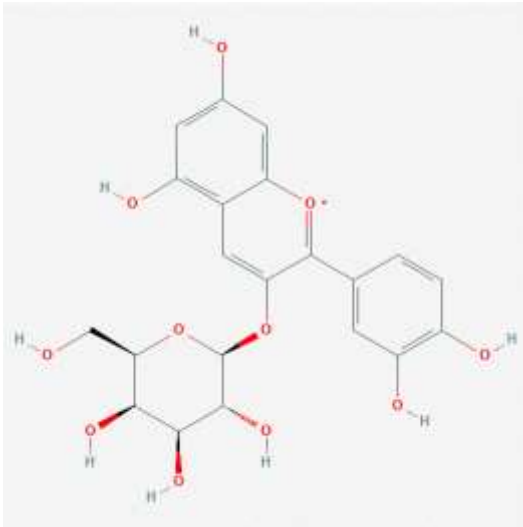
Loganic acid



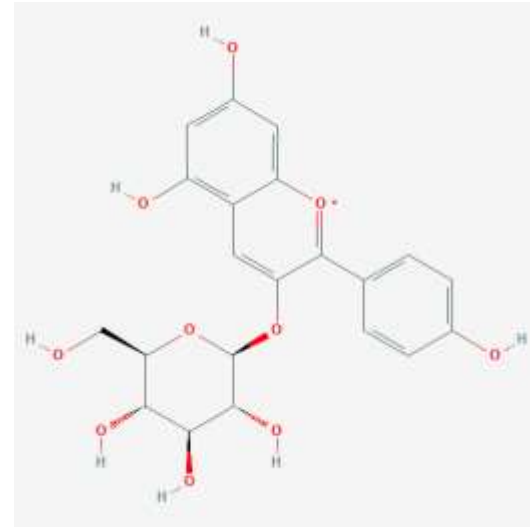
Loganin



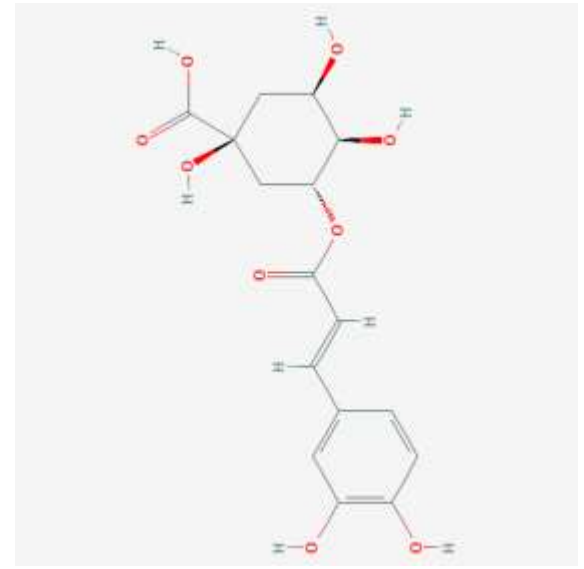
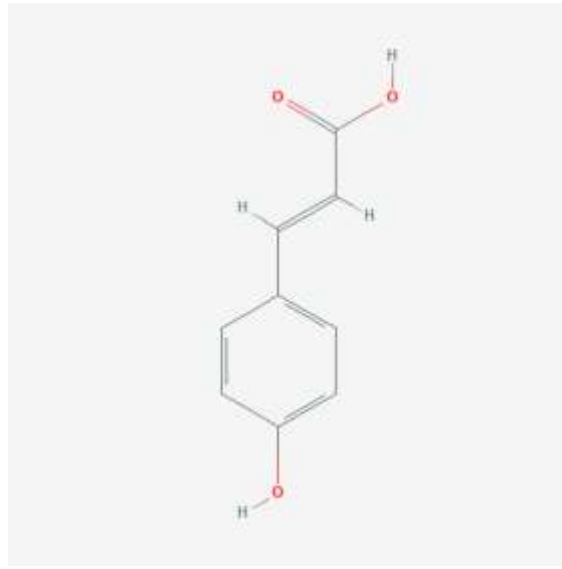
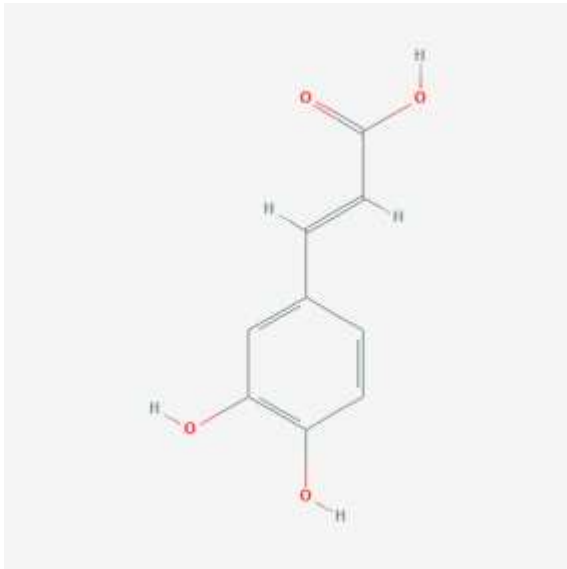
Cornuside



**Cyanidin
3-galactoside**



**Pelargonidin
3-galactoside**

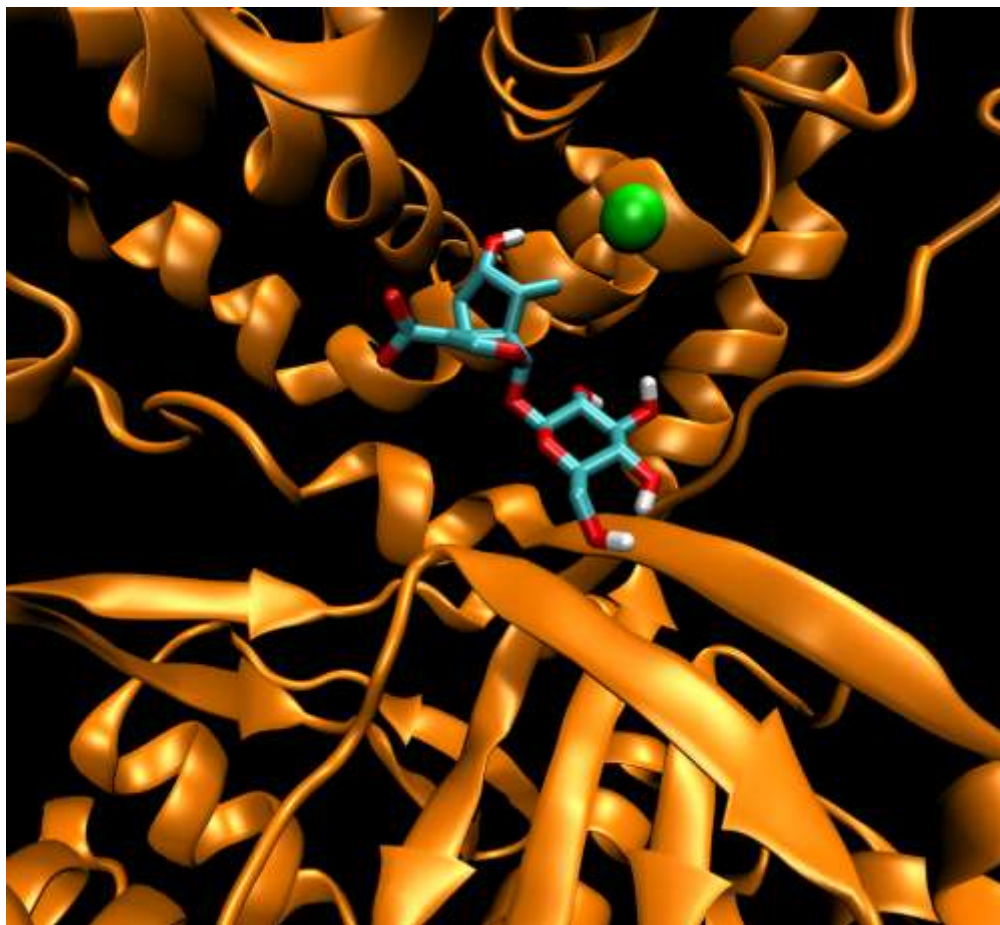


Caffeic acid

Coumaric acid (4p)

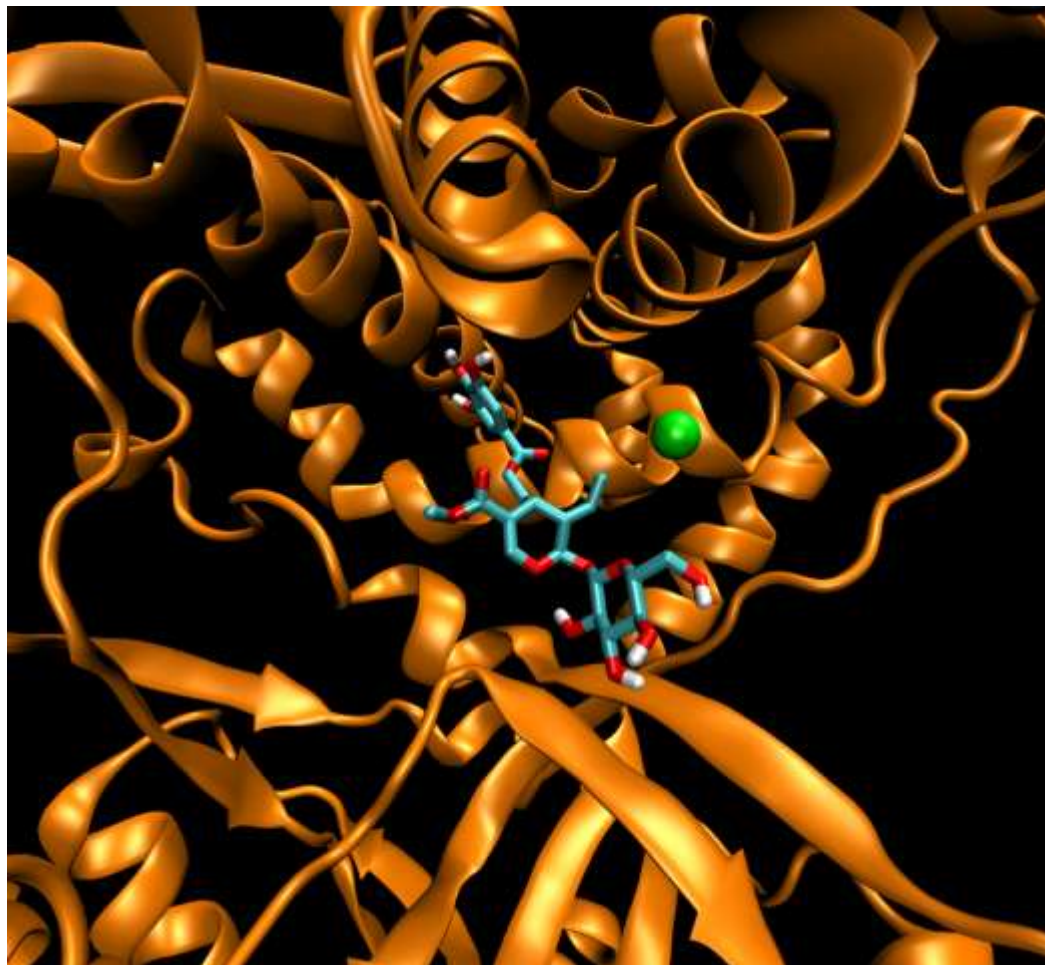
Chlorogenic acid

RESULTS



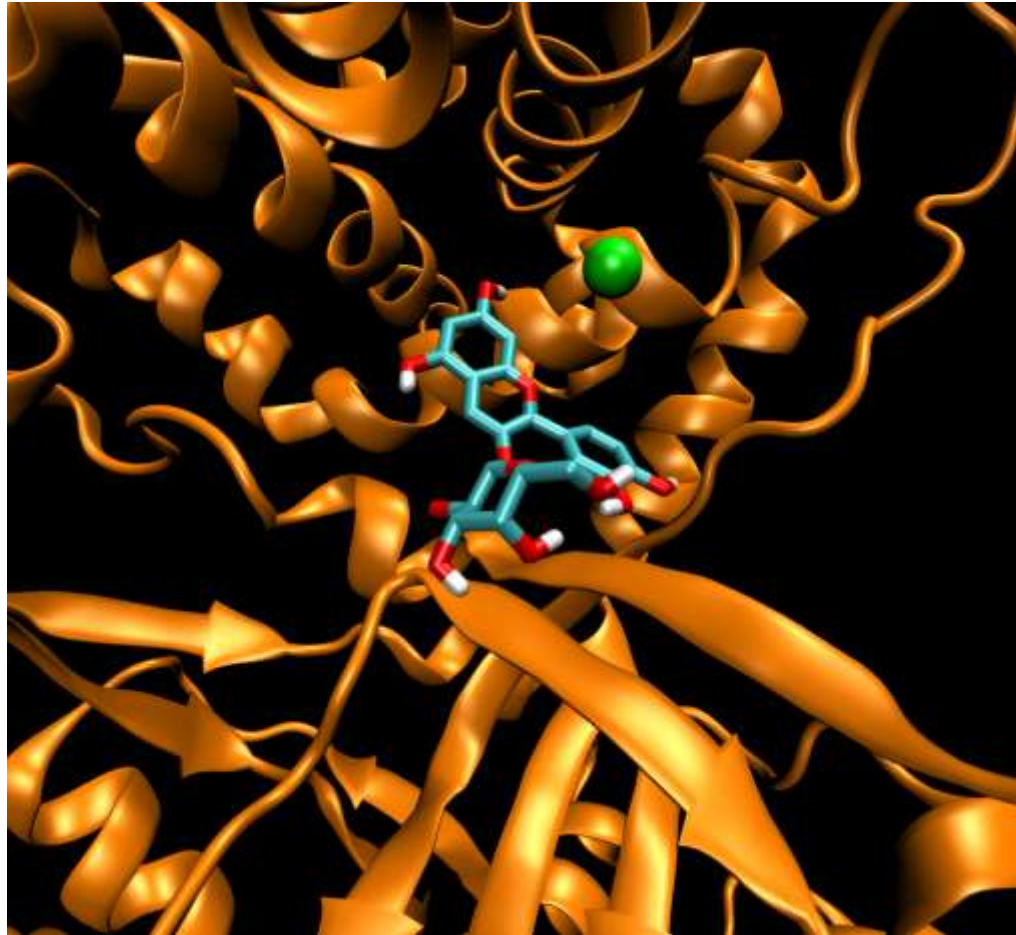
DPP III-Loganimin

RESULTS



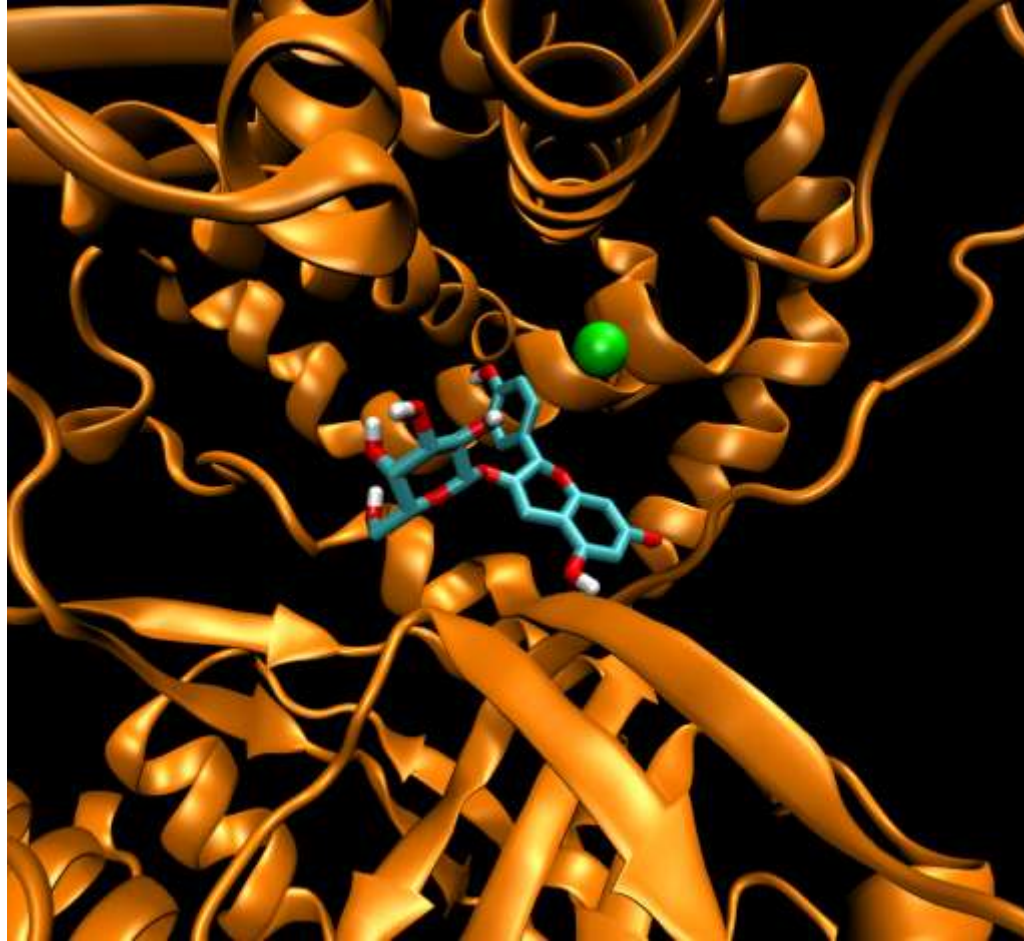
DPP III-Cornuside

RESULTS



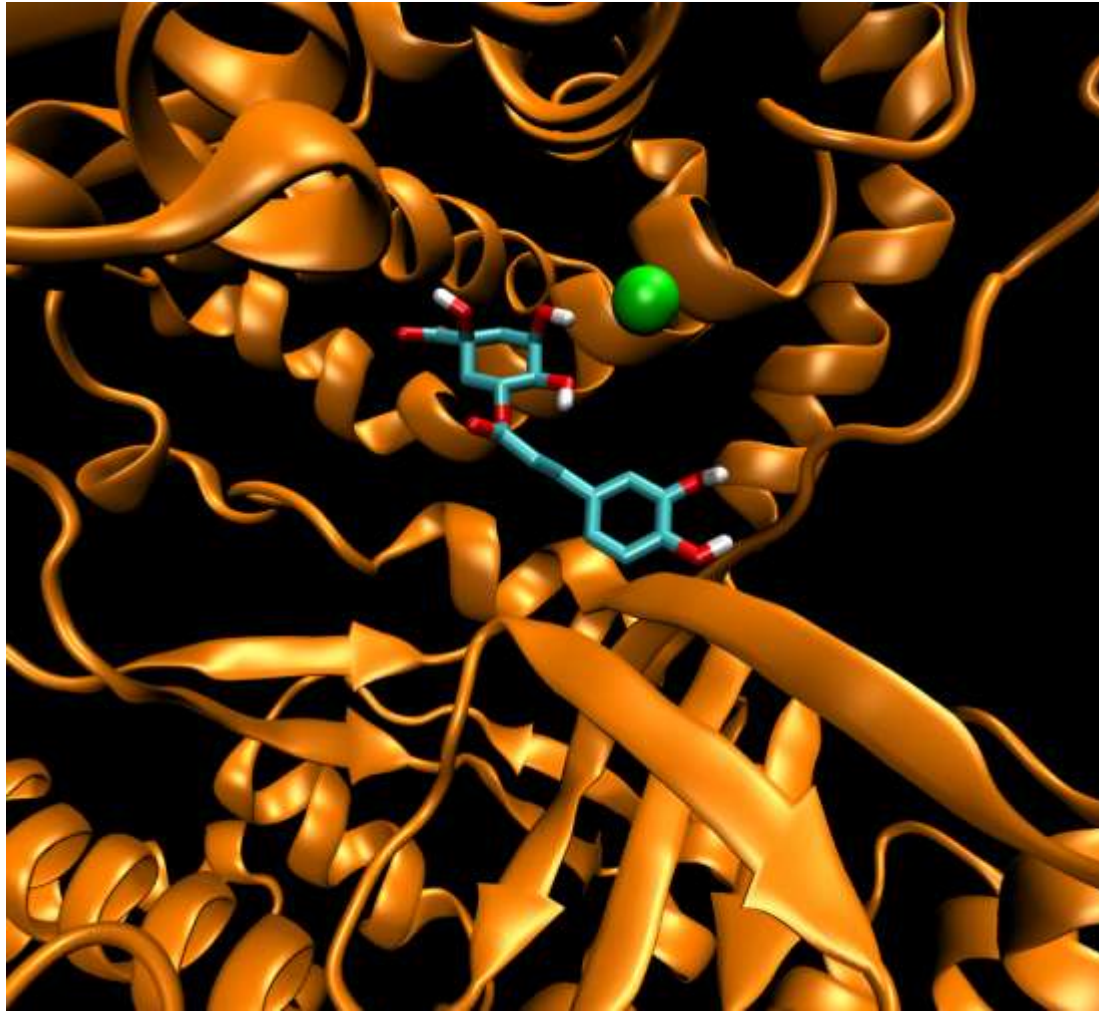
DPP III-Cyanidin 3-galactoside

RESULTS



DPP III-Pelargonidin 3-galactoside

RESULTS



DPP III-Chlorogenic acid

Thank You!