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## **Supplementary information**

## Effect and Mechanism of Oritavancin on hIAPP Amyloid Formation

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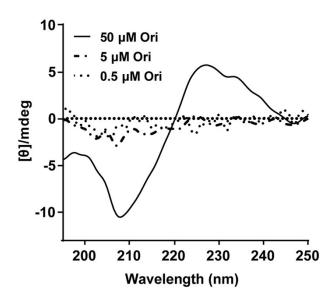


Fig. S1 CD spectra of different concentrations of Ori at 195- 250 nm.

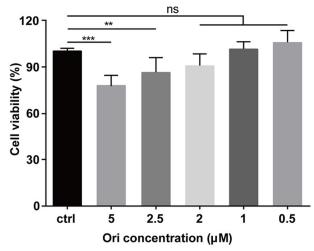


Fig. S2 The cytotoxic effect of Ori (0.5-5  $\mu$ M) on cell viability in NIT-1 cells for 24 h. Data are shown as means  $\pm$  SD, n = 3 in normal distribution (\*p<0.05; \*\*p< 0.01; \*\*\*p<0.001).

Table S1. Result of Vina docking parameters for hIAPP + Ori.

mode	affinity (kcal mol <sup>-1</sup> )
1	-6.3
2	-6.2
3	-6.2
4	-6.2
5	-6.2
6	-6.1
7	-6.0
8	-5.8
9	-5.8

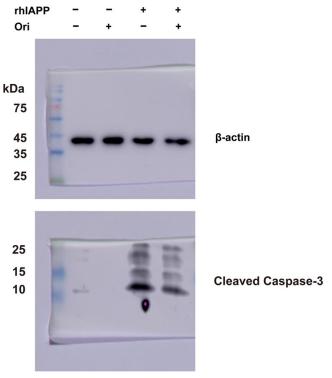


Fig. S3 The original scanned image of the western blot for  $\beta$ -actin and Cleaved Caspase-3 in Figure 6D.

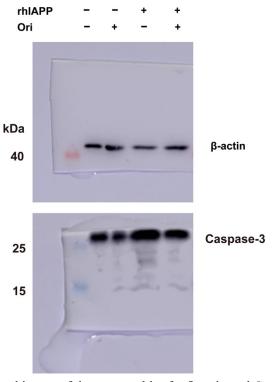


Fig. S4 The original scanned image of the western blot for  $\beta$ -actin and Caspase-3 in Figure 6D.

Table S2. Comparison of the inhibition efficiencies with Ori and several reported compounds.

Compounds	Max concentration		Min concentration		D - £
	Molar ratio*	Inhibition ratio	Molar ratio*	Inhibition ratio	- Ref
Cloridarol	1:5	55.6%	1:1	17.3%	[1]
Genistein	1:5	63.4%	1:1	52.1%	[2]
Tanshinones 1	1:1	~70%	1:0.25	~63%	[3]
Tanshinones 2	1:1	~69%	1:0.25	~60%	[3]
Silybin A	1:0.8	~50%	1:0.1	N/A	[4]
Silybin B	1:0.8	~60%	1:0.1	No effect	[4]
Flavonoids B	1:4	92%	1:1	N/A	[5]
Flavonoids Ba	1:4	71%	1:1	N/A	[5]
Flavonoids W	1:4	40%	1:1	N/A	[5]
Flavonoids O	1:4	42%	1:1	N/A	[5]
Salvianolic acid B	1:5	Almost complete inhibition	1:1	68%	[6]
Isoquinoline alkaloids CHE	1:5	84.4%	1:1	54.4%	[7]
Bleomycin	1:5	N/A	1:1	N/A	[8]
Tetracycline derivatives	1:5	N/A	1:1	N/A	[9]
Teicoplanin	1:1	~71%	1:0.5	No effect	This work
Dalbavancin	1:1	~73%	1:0.5	No effect	This work
Oritavancin	1:1	Almost complete inhibition	1:0.01	36%	This work

<sup>\*:</sup> Molar ratio=hIAPP/compounds

## Reference

- [1] Tang, Y., et al., Repurposing a Cardiovascular Disease Drug of Cloridarol as hIAPP Inhibitor. ACS Chemical Neuroscience, 2021. **12**(8): p. 1419-1427.
- [2] Ren, B., et al., Genistein: A Dual Inhibitor of Both Amyloid β and Human Islet Amylin Peptides. ACS Chemical Neuroscience, 2018. 9(5): p. 1215-1224.
- [3] Ren, B., et al., Tanshinones inhibit hIAPP aggregation, disaggregate preformed hIAPP fibrils, and protect cultured cells. Journal of Materials Chemistry B, 2018. 6(1): p. 56-67.
- [4] García-Viñuales, S., et al., Silybins inhibit human IAPP amyloid growth and toxicity through stereospecific interactions. Biochimica et Biophysica Acta (BBA) Proteins and Proteomics, 2022. 1870(5).
- [5] Wang, Y., et al., Inhibitory activities of flavonoids from Scutellaria baicalensis Georgi on amyloid aggregation related to type 2 diabetes and the possible structural requirements for polyphenol in inhibiting the nucleation phase of hIAPP aggregation. International Journal of Biological

- Macromolecules, 2022. 215: p. 531-540.
- [6] Cheng, B., et al., Salvianolic acid B inhibits the amyloid formation of human islet amyloid polypeptide polypeptide protects pancreatic beta-cells against cytotoxicity. Proteins: Structure, Function, and Bioinformatics, 2012. **81**(4): p. 613-621.
- [7] Wang, Y., et al., Exploration of Isoquinoline Alkaloids as Potential Inhibitors against Human Islet Amyloid Polypeptide. ACS Chemical Neuroscience, 2022. 13(14): p. 2164-2175.
- [8] Kumari, A., et al., *Bleomycin modulates amyloid aggregation in β-amyloid and hIAPP*. RSC Advances, 2020. **10**(43): p. 25929-25946.
- [9] Xu, J., et al., Tetracycline derivatives resist the assembly behavior of human islet amyloid polypeptide. Biochimie, 2020. 174: p. 95-106.