

Mechanism-inspired design and synthesis of drug candidates for cancer, infectious and Alzheimer's diseases

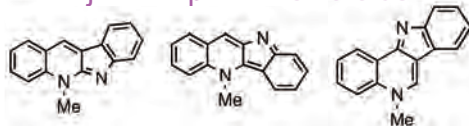
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Development of drugs based on natural ingredients

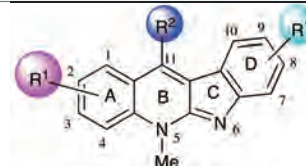


Major component alkaloids

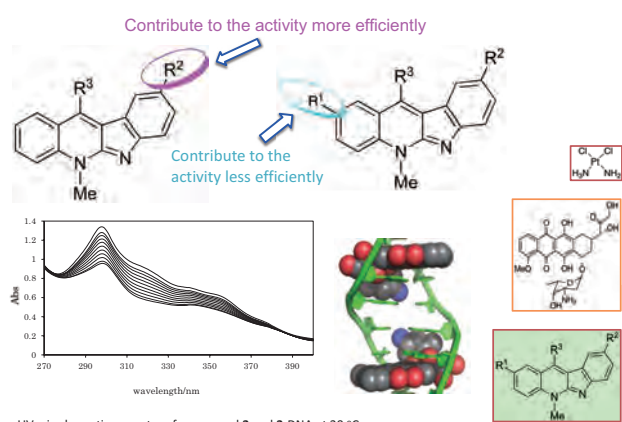


Power of organic synthesis for derivatives

Construction of drug discovery library

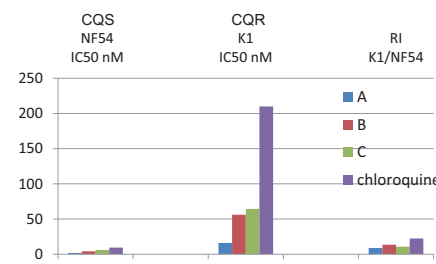
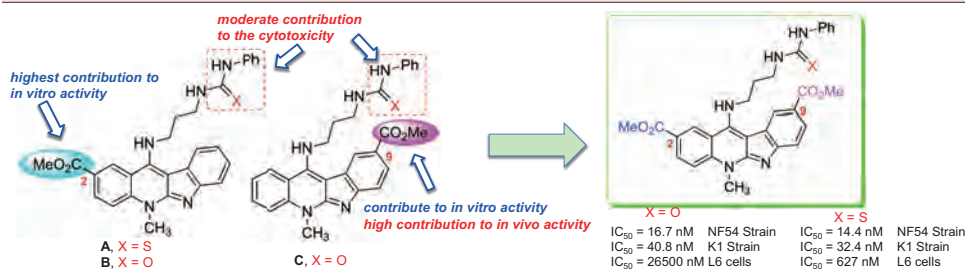


(I) Anticancer drug candidate molecules



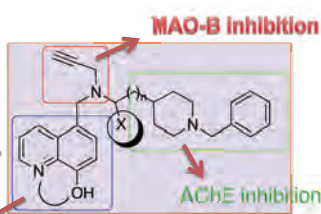
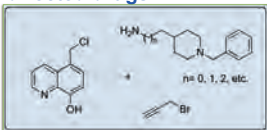
	R ¹	R ²	R ³	MV4-11 IC ₅₀ (μM)	BALB/3T3 IC ₅₀ (μM)	A549 IC ₅₀ (μM)	HCT116 IC ₅₀ (μM)
				Human leukemia cell line	Mice fibroblast cell	Human lung cancer cell line	Human colon cancer cell line
				(cancer)	normal	(cancer)	(cancer)
cisplatin				2.820±0.450	8.700±0.970	9.870±2.400	8.500±0.540
Doksorubicin				0.006±0.002	1.078±0.0033	0.329±0.097	0.329±0.097
1	H	H		0.065±0.0023	0.884±0.115	0.205±0.079	0.302±0.056
2	Br	H		0.012±0.002	0.869±0.018	0.543±0.256	0.274±0.050
3	H	CO ₂ Me		0.044±0.011	0.933±0.047	0.664±0.154	0.176±0.055

(II) Antimalarial drug candidate molecules

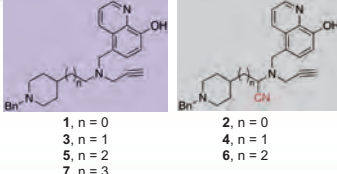
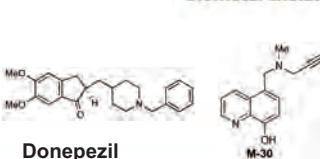


(III) anti-Alzheimer's drug candidate molecules

Synthesis and evaluation of neuroprotective multi-target directed drugs



Bimetal chelation



Compound	EeAChE	eqBuChE	BuChE/AChE	ratMAO-A	rat MAO-B	MAO-B/MAO-A
1	≥ 100	≥ 100	-	≥ 100	≥ 100	≥ 1
2	14.53 ± 3.7	13.5 ± 1.8	0.92	22.07 ± 0.7	39.48 ± 1.4	1.7
3	17.03 ± 4.7	12.8 ± 1.4	0.75	85.36 ± 3.7	19.41 ± 3.2	0.22
4	5.53 ± 0.5	6.06 ± 0.6	1.1	9.67 ± 1.5	12.36 ± 2.5	1.2
5	5.01 ± 0.8	14.47 ± 3.6	2.8	≥ 100	50.08 ± 0.5	≥ 0.5
6	1.77 ± 0.1	1.63 ± 0.25	0.92	6.16 ± 0.7	10.21 ± 0.9	1.7
7	2.67 ± 0.4	4.52 ± 0.3	1.6	≥ 100	34.54 ± 3.5	≥ 0.34
Donepezil	31.39 ± 4.00 nM	8.01 ± 0.86	258	850 ± 13	15 ± 2.2	0.020
M-30	113.86 ± 14.05	≥ 100	-	0.037 ± 0.02	0.057 ± 0.02	1.5

(IC₅₀ / μM)