

Supporting Information

Gold Nanoparticles Decorated Polypyrrole/graphene Oxide Nanosheets as a Modified Electrode for Simultaneous Determination of Ascorbic acid, Dopamine and Uric acid

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Fig. S1. (a) SEM image of pure PPy on CFP. (b) FTIR spectra of (i) GO, (ii) Ppy, (iii) GO/PPy, and (iv) Au@GO/PPy. (c) EDS image of Au@GO/PPy

Fig. S2. CV curves of Au@GO/PPy/CFP in 0.1 M PBS (pH = 7.0) containing (a) 1 mM AA, (b) 1 mM DA and (c) 1 mM UA at different scan rates (50–200 mV s⁻¹). (d-f) Corresponding plots of the anodic peak current vs. scan rate for (d) AA, (e) DA and (f) UA respectively.

Fig. S3. (a)-(e)SEM of AuNPs on GO/PPy/CFP prepared with different scan number of CV(1, 3, 6, 9, 12 respectively).

Fig. S4. (a)CV curves and of different AuNPs@GO/PPy/CFP prepared with various scan number in 0.1 M PBS containing the mixture of 1mM AA 1mM DA and 1mM UA. (b) Peak current of CV curves.

Fig. S5. DPV cures of AuNPs@GO/PPy/CFP in 0.1 M PBS (pH=7.0) with different concentrations of AA, DA and UA. (a) 10–1600 μM AA, (c) 0.15–60 μM DA, (e) 2–437.5 μM UA. (b),(d),(f) Corresponding plots of the anodic peak current vs. concentrations for AA, DA and UA respectively(n = 3).

Fig. S6. Amperometric responses of AuNPs@GO/PPy/CFP in 0.1M PBS containing (a) 40 μM AA, (b) 20 μM DA and (c) 40 μM UA respectively for stability test. (d) Long term stability of AuNPs@GO/PPy/CFP toward 150 μM AA, 5 μM DA and 100 μM UA for two weeks.

Fig. S7. DPV cures of AuNPs@GO/PPy/CFP in diluted urine (n = 3).

Table S1. Comparison of different modified electrodes for the selective detection of AA, DA and UA.

Table S2. Determination of AA, DA and UA in human urine with AuNPs@GO/PPy/CFP (n=3).

Fig. S1

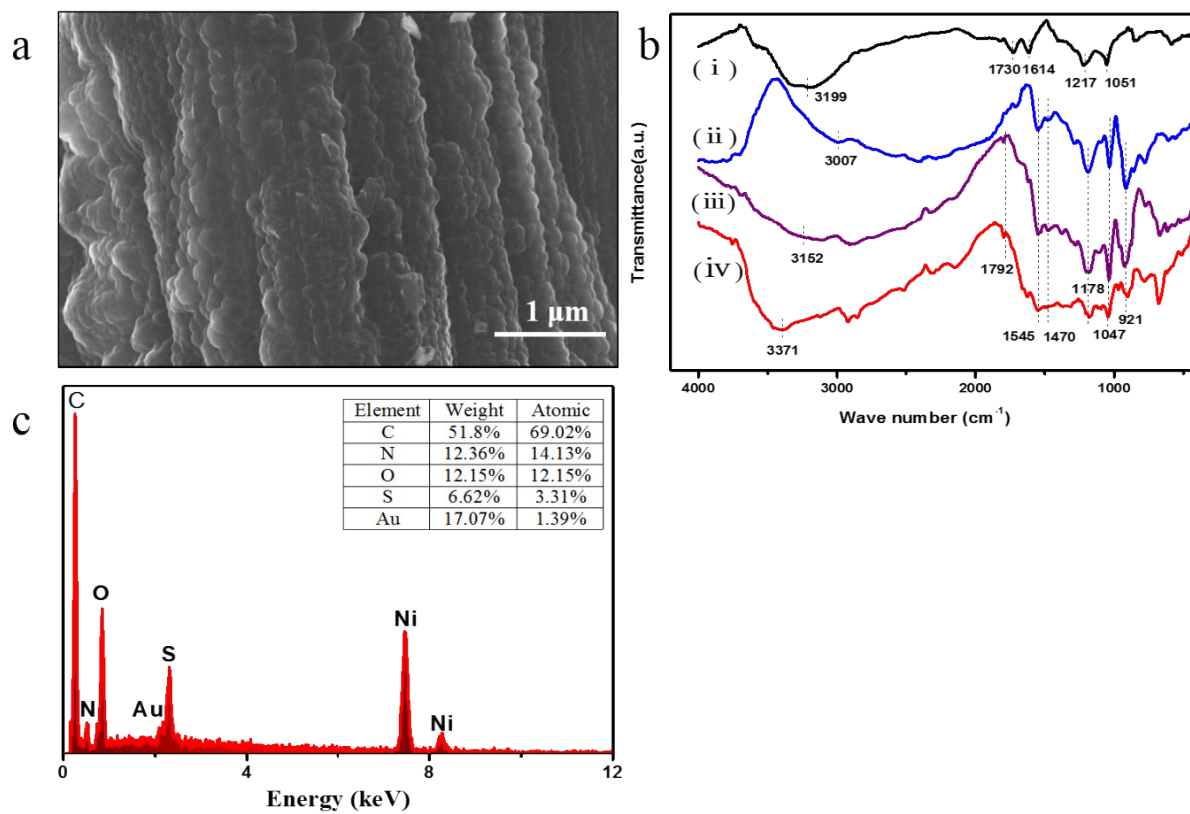


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Fig. S2

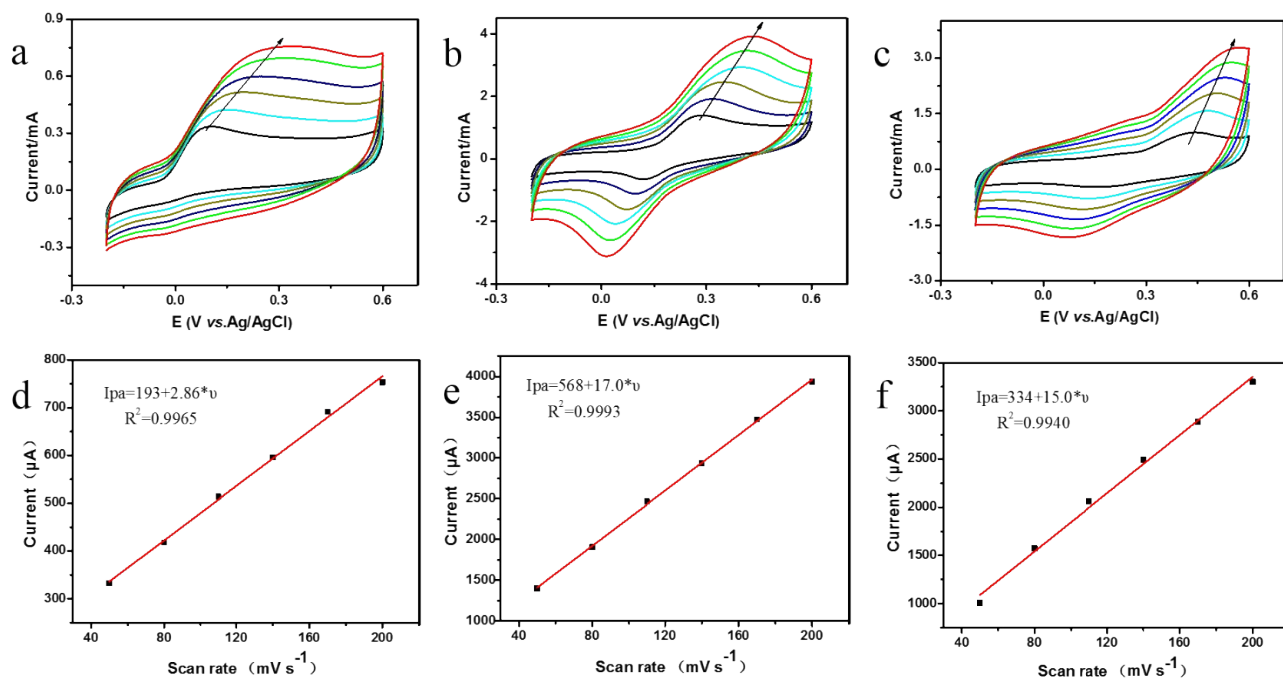


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Fig. S3

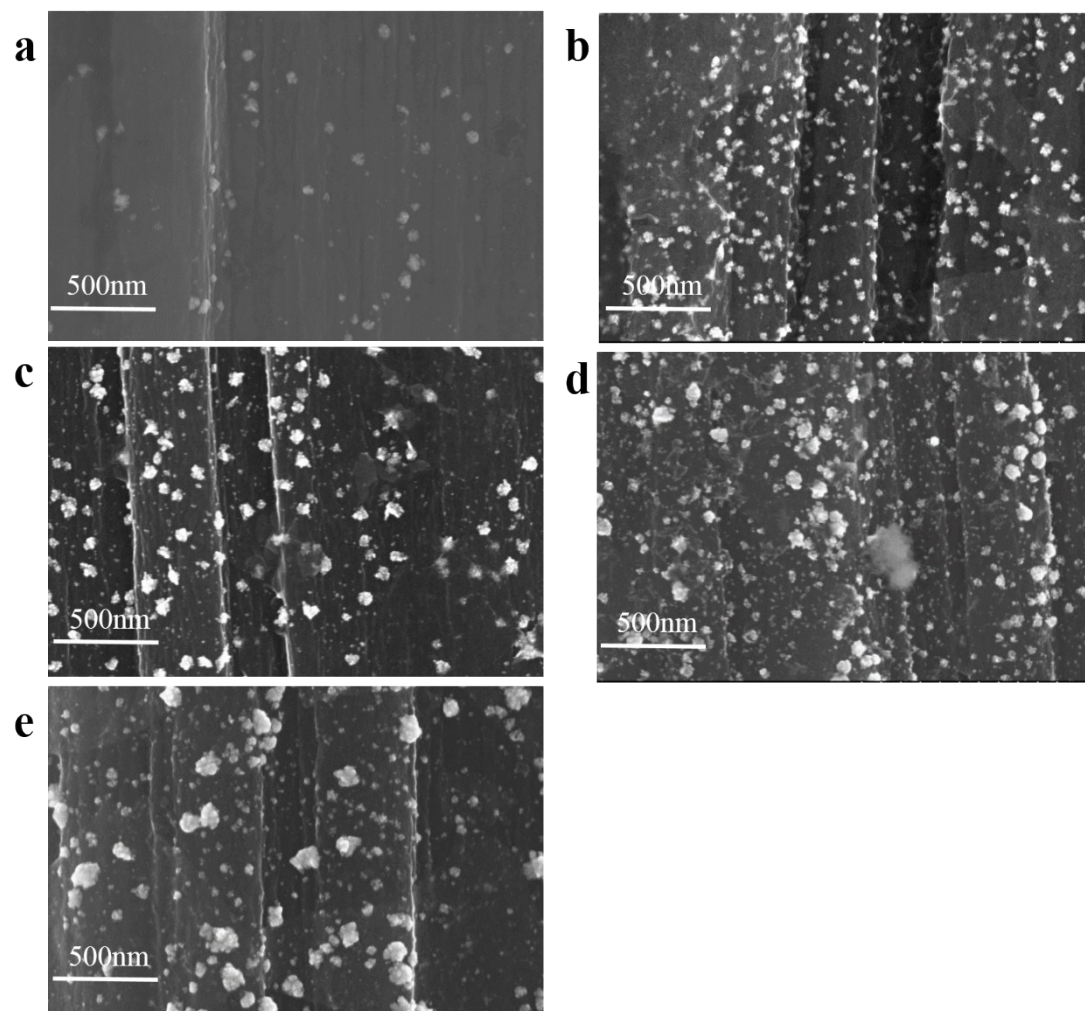


Fig. S3. (a)-(e)SEM of AuNPs on GO/PPy/CFP prepared with different scan number of CV(1, 3, 6, 9, 12 respectively).

Fig. S4

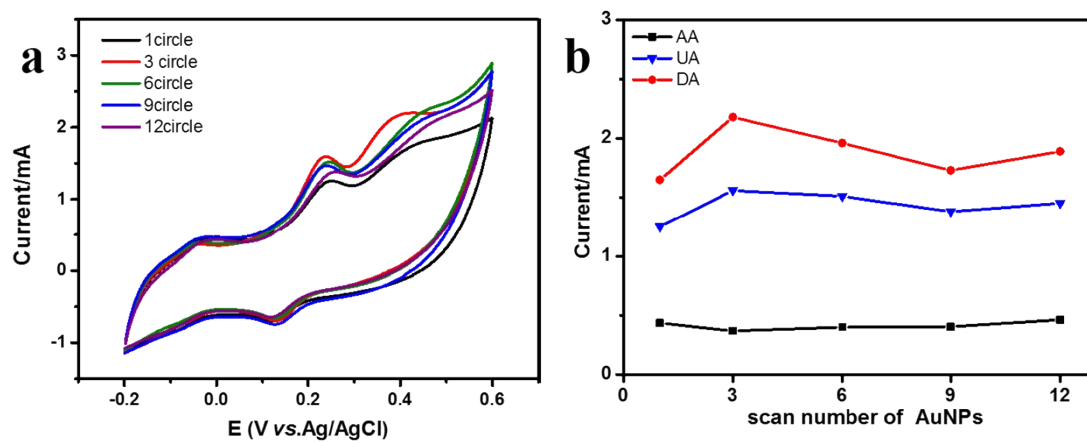


Fig. S4. (a) CV curves and of different AuNPs@GO/PPy/CFP prepared with various scan number of CV in 0.1 M PBS containing the mixture of 1mM AA 1mM DA and 1mM UA. (b) Peak current of CV curves.

Fig. S5

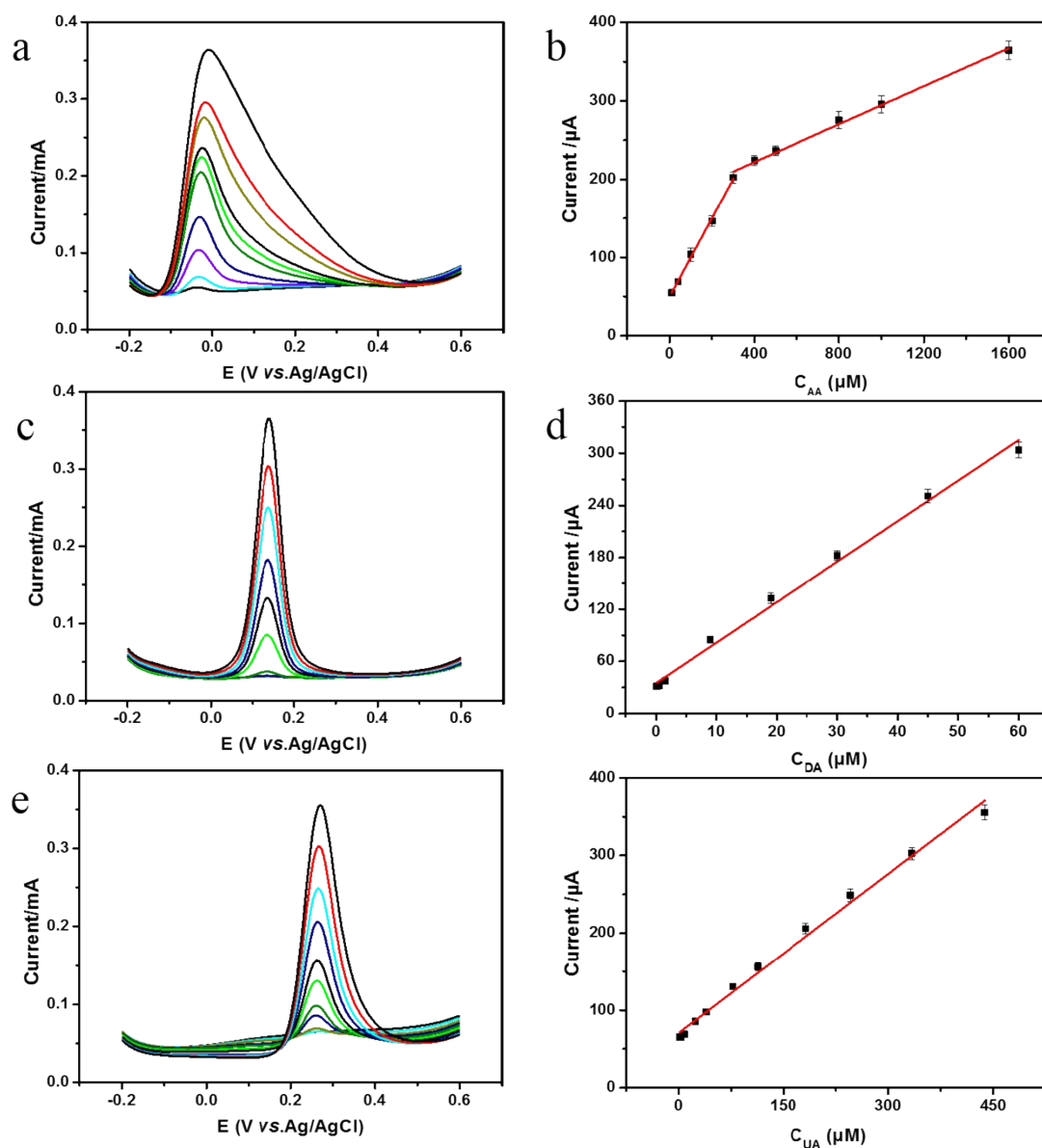


Fig. S5. DPV curves of AuNPs@GO/PPy/CFP in 0.1 M PBS (pH=7.0) with different concentrations of AA, DA and UA. (a) 10–1600 μ M AA, (c) 0.15–60 μ M DA, (e) 2–437.5 μ M UA. (b),(d),(f) Corresponding plots of the anodic peak current vs. concentrations for AA, DA and UA respectively. (n = 3)

Fig. S6

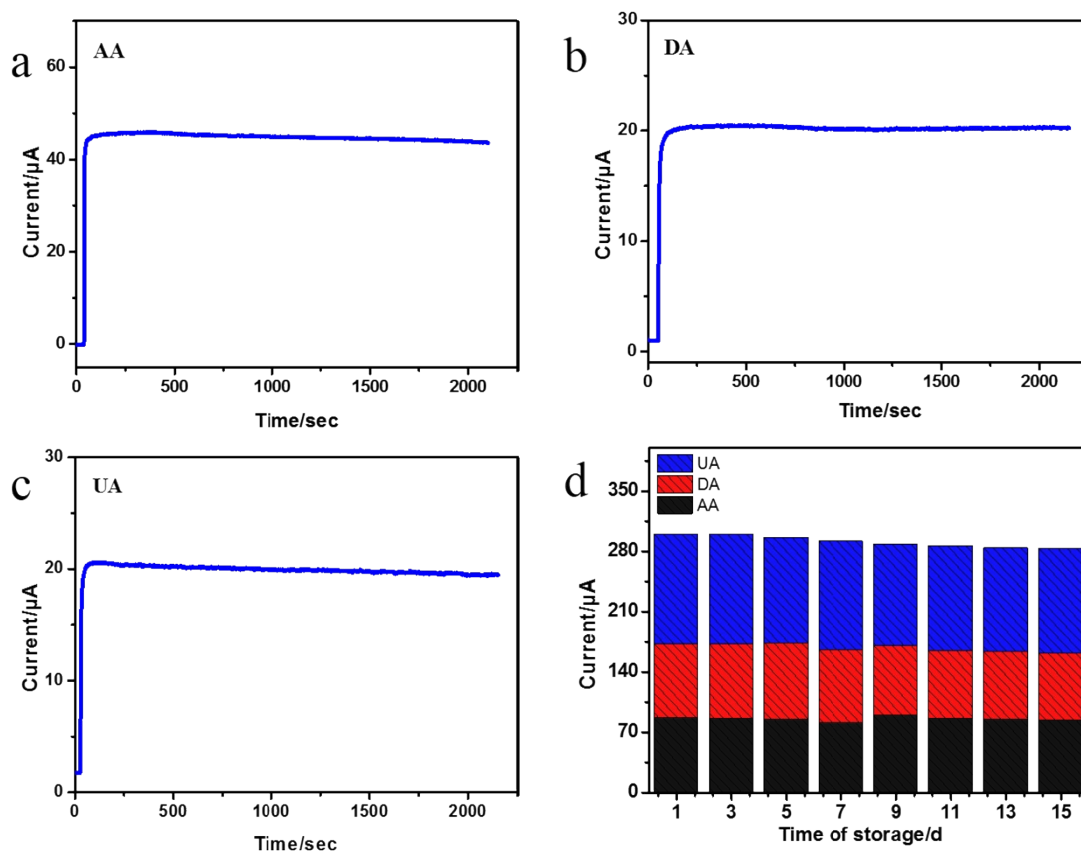


Fig. S6. Amperometric responses of AuNPs@GO/PPy/CFP in 0.1M PBS containing (a) 40 μM AA, (b) 20 μM DA and (c) 40 μM UA respectively for stability test. (d) Long term stability of AuNPs@GO/PPy/CFP toward 150 μM AA, 5 μM DA and 100 μM UA for two weeks.

Fig. S7

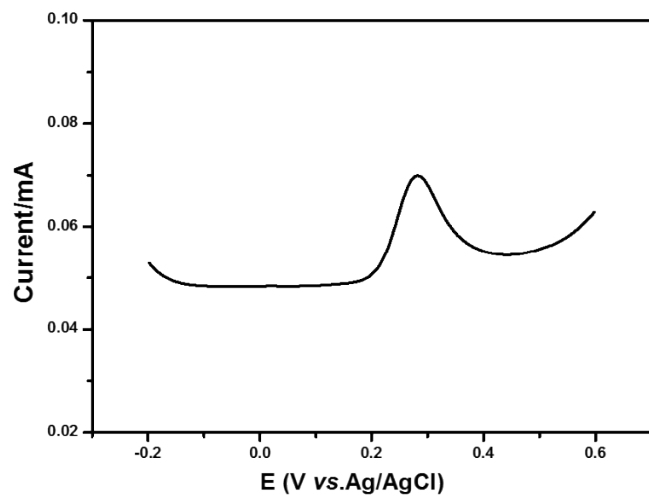


Fig. S7. DPV curve of AuNPs@GO/PPy/CFP in urine diluted 50 times (n = 3).

Table S1. Comparison of different modified electrodes for the selective detection of AA, DA and

UA.

Electrode	Linear range (μM)			Detection limit (μM)			Reference
	AA	DA	UA	AA	DA	UA	
RGO ^a /AuNPs	10-1000	0.1-100	0.1-100	5.7	0.69	2.2	1
ZnCl ₂ -CF ^b /GCE	0.05-200	2-2000	1-2500	0.02	0.16	0.11	2
PI _{mox} ^c -GO/GCE	75-2275	12-278	3.6-249.6	18	0.63	0.59	3
G ^d -30	5-1000	3-140	0.5-150	17.8	1.44	0.29	4
AuNPs-GO/Au-IDA ^e	4.6-193	—	2-1050	1.4	—	0.62	5
OPPy/ERGO ^f	—	2.0–160 0.4–517	—	—	0.5	—	6
CTAB- GO/MWCNT/GCE	5.0-300	5.0-500	3.0-60	1.0	1.5	1.0	7
H-GO/GCE ^g	1-100	0.5-40	0.5-50	0.3	0.17	0.17	8
AuNPs@GO/PPy/CFP	10-200 200-1400	0.2-55	2-412	3.03	0.083	1.82	This work

^a RGO: reduced graphene oxide

^b CF: kiwi skin-derived microporous carbons

^c PI_{mox}: overoxidized polyimidazole

^d G: graphene ink coated glass

^e Au-IDA: gold interdigitated microelectrodes array

^f OPpy/ERGO: overoxidized polypyrrole /reduced graphene oxide

εH-GO: hemin functionalized graphene oxide

Table S2. Determination of AA, DA and UA in human urine with AuNPs@GO/PPy/CFP (n=3)

Analyte	Detected (μM)	Added (μM)	Found (μM)	Recovery (%)	RSD (%)
AA	—	100	109	109	0.58
		200	208	104	1.04
		300	303	101	1.16
DA	—	2.00	1.94	96.8	0.73
		6.00	5.92	98.6	1.40
		10.0	9.81	98.1	0.87
UA	31.1	20.0	50.9	99.6	1.58
		40.0	73.2	103	2.02

Reference

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