

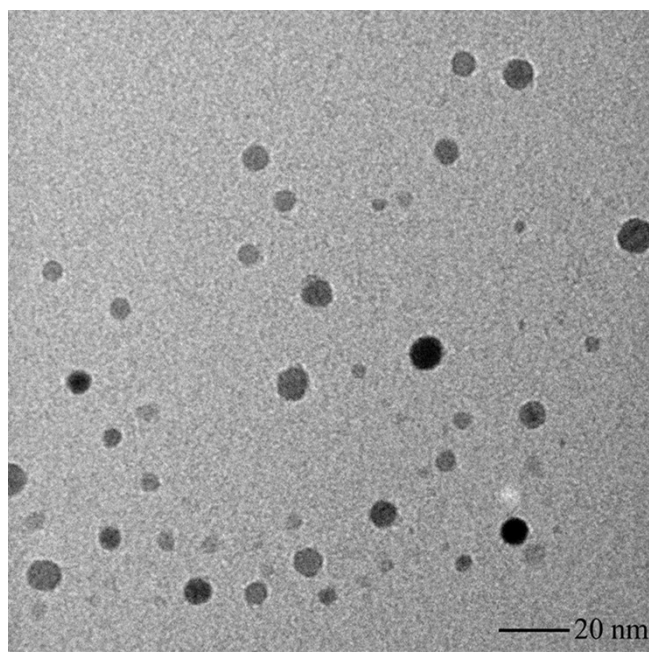
### Supporting Information

#### **Reactive oxygen species-mediated CuRuO<sub>x</sub>@HA hybrid nanozyme for Multidrug Resistant-Bacterial infections with synergistic photothermal therapy**

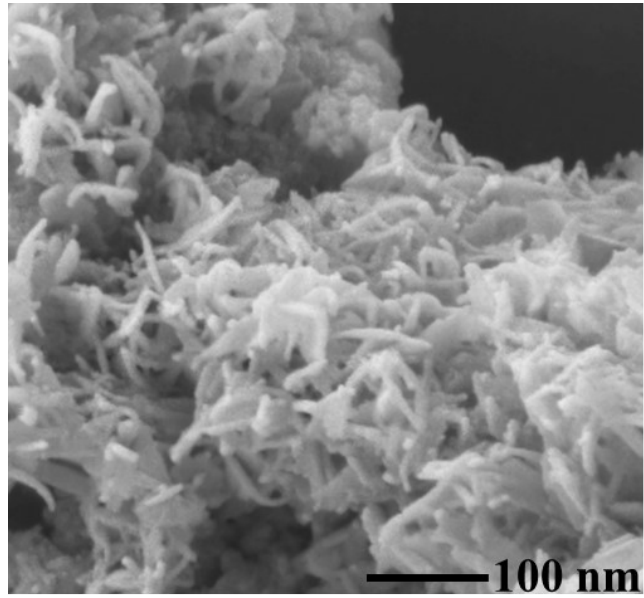
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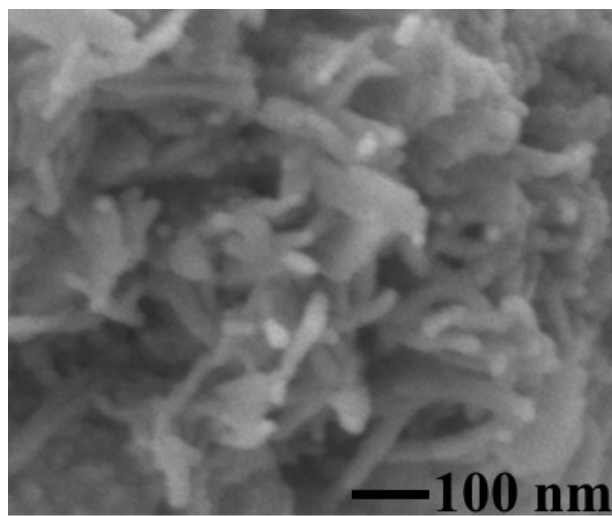
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**Fig. S1** TEM image of copper-containing oxide.



**Fig. S2** SEM image of  $\text{CuRuO}_x$  NPs.



**Fig. S3** SEM image of  $\text{CuRuO}_x$ @HA NPs.

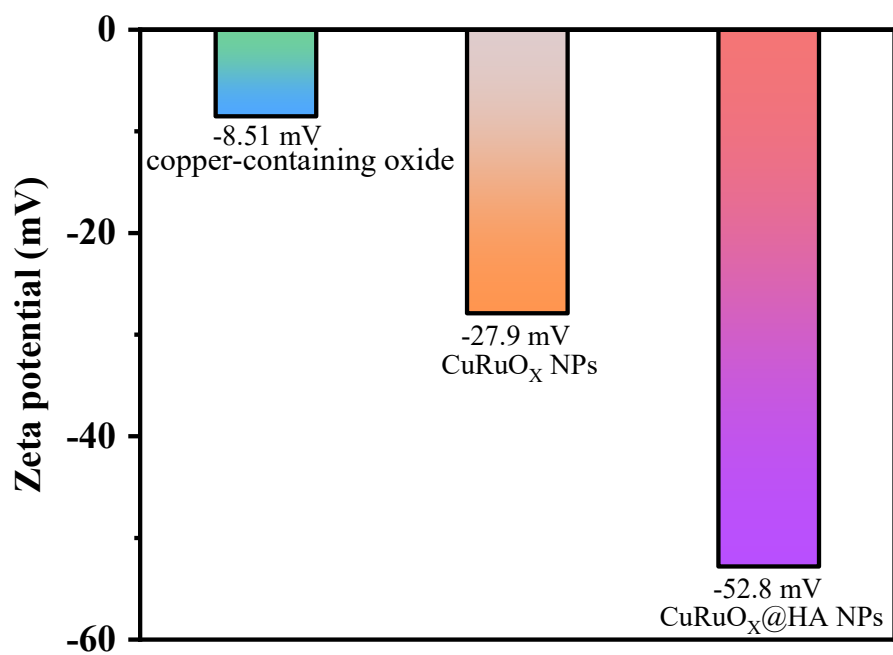


Fig. S4 Zeta potentials of copper-containing oxide, CuRuO<sub>x</sub> NPs and CuRuO<sub>x</sub>@HA NPs.

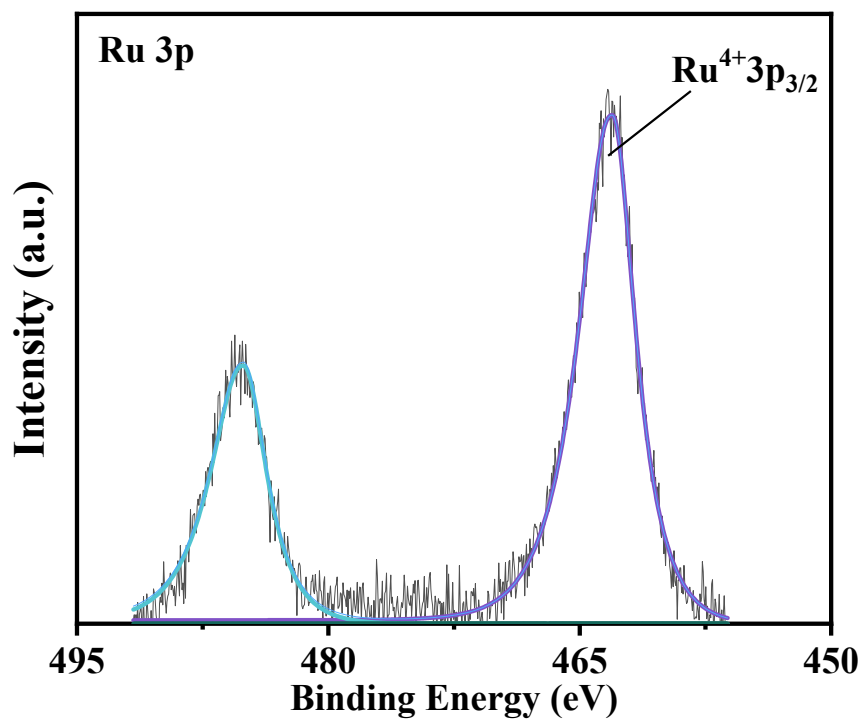
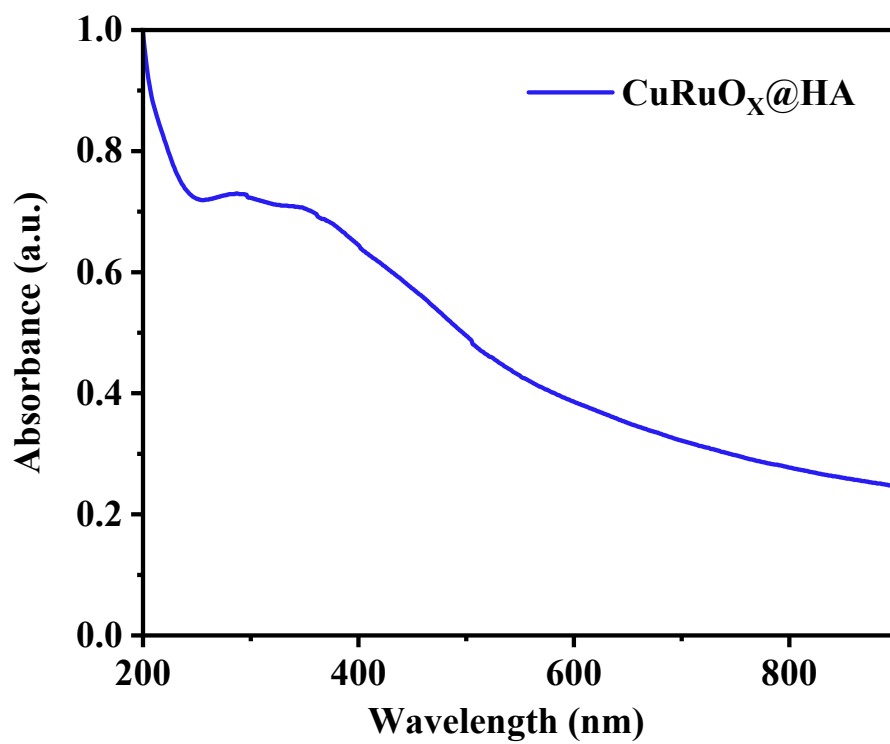
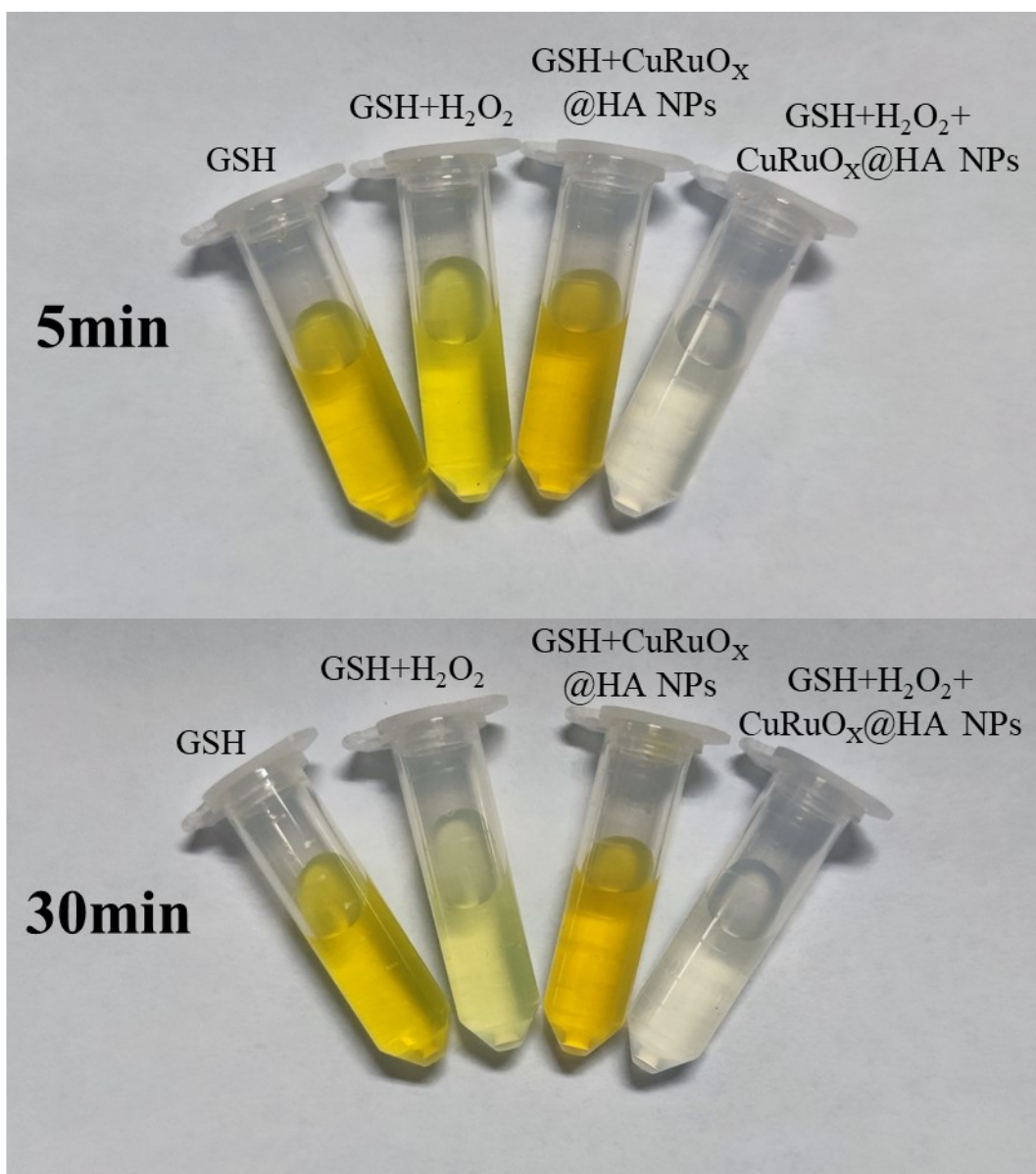


Fig. S5 Ru 3p XPS spectrum of CuRuO<sub>x</sub> NPs.



**Fig. S6** UV-vis-NIR spectrum of CuRuO<sub>x</sub>@HA NPs.



**Fig. S7** Digital photographs of GSH, GSH+H<sub>2</sub>O<sub>2</sub>, GSH+CuRuO<sub>x</sub>@HA NPs, GSH+H<sub>2</sub>O<sub>2</sub>+CuRuO<sub>x</sub>@HA NPs solutions treated by DTNB at different times.

Catalyst	Substance	$K_m$ (mM)	$V_{max}$ ( $10^{-7}$ M/s)	References
CuRuO <sub>x</sub> @HA	H <sub>2</sub> O <sub>2</sub>	0.35	3.66	This work
CuRuO <sub>x</sub> @HA	TMB	0.14	4.18	This work
HPR	H <sub>2</sub> O <sub>2</sub>	3.7	0.871	1
HPR	TMB	0.434	1	1
MnCo <sub>2</sub> S <sub>3</sub> .1Se <sub>0.9</sub> /NF	H <sub>2</sub> O <sub>2</sub>	8.3	5.55	2
MnCo <sub>2</sub> S <sub>3</sub> .1Se <sub>0.9</sub> /NF	TMB	3.36	1.16	2
HA@MRuO <sub>2</sub> -Cip/GOx	H <sub>2</sub> O <sub>2</sub>	0.13	0.364	3
HA@MRuO <sub>2</sub> -Cip/GOx	TMB	0.08	0.422	3
QCS-RBT@RuO <sub>2</sub>	H <sub>2</sub> O <sub>2</sub>	0.11	1079	4
QCS-RBT@RuO <sub>2</sub>	TMB	0.146	1720	4
CuO	H <sub>2</sub> O <sub>2</sub>	19.76	0.65	5
HM-CuO	H <sub>2</sub> O <sub>2</sub>	0.0608	0.04605	6

**Table S1.** Comparison of the kinetic parameters of CuRuO<sub>x</sub>@HA NPs with other reported nanozymes.  $K_m$  is the Michaelis-Menten constant, and  $V_{max}$  is the maximum reaction velocity.

### References

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