Supporting Information

Facile Aqueous Synthesis and Comparative Evaluation of TiO_2-Semiconductor and TiO_2-Metal Nanohybrid Photocatalysts in Antibiotics Degradation Under Visible Light.

Yuping Zhang[1,§], Shijie Ju[1,§], Yuping Zhang[1,§], Gregori Casals[2,3], Jie Tang [1], Yichao Lin[1], Xiaofang Li[1], Lihua Liang[1], Zhiyu Jia[4,*], Muling Zeng[1,*], Eudald Casals[1,*]

[1]School of Biotechnology and Health Sciences, Wuyi University, Jiangmen 529020, PR China

[2]Biochemistry and Molecular Genetics Department, Clinical and Provincial Hospital of Barcelona, Barcelona 08036, Spain.

[3]IDIBAPS Research Center, Barcelona 08036, Spain.

[4]Key Laboratory of Cluster Science, Ministry of Education of China, Beijing Key Laboratory of Photoelectronic/Electrophotonic Conversion Materials, School of Chemistry and Chemical Engineering, Beijing Institute of Technology, Beijing 100081, PR China

[§]Both authors contributed equally to this study.

Corresponding authors email:

Zhiyu Jia: jzy@bit.edu.cn

Muling Zeng: mulingzeng@163.com

Eudald Casals: wyuchemecm@126.com

Figure S1. Characterization of the single-component nanoparticles

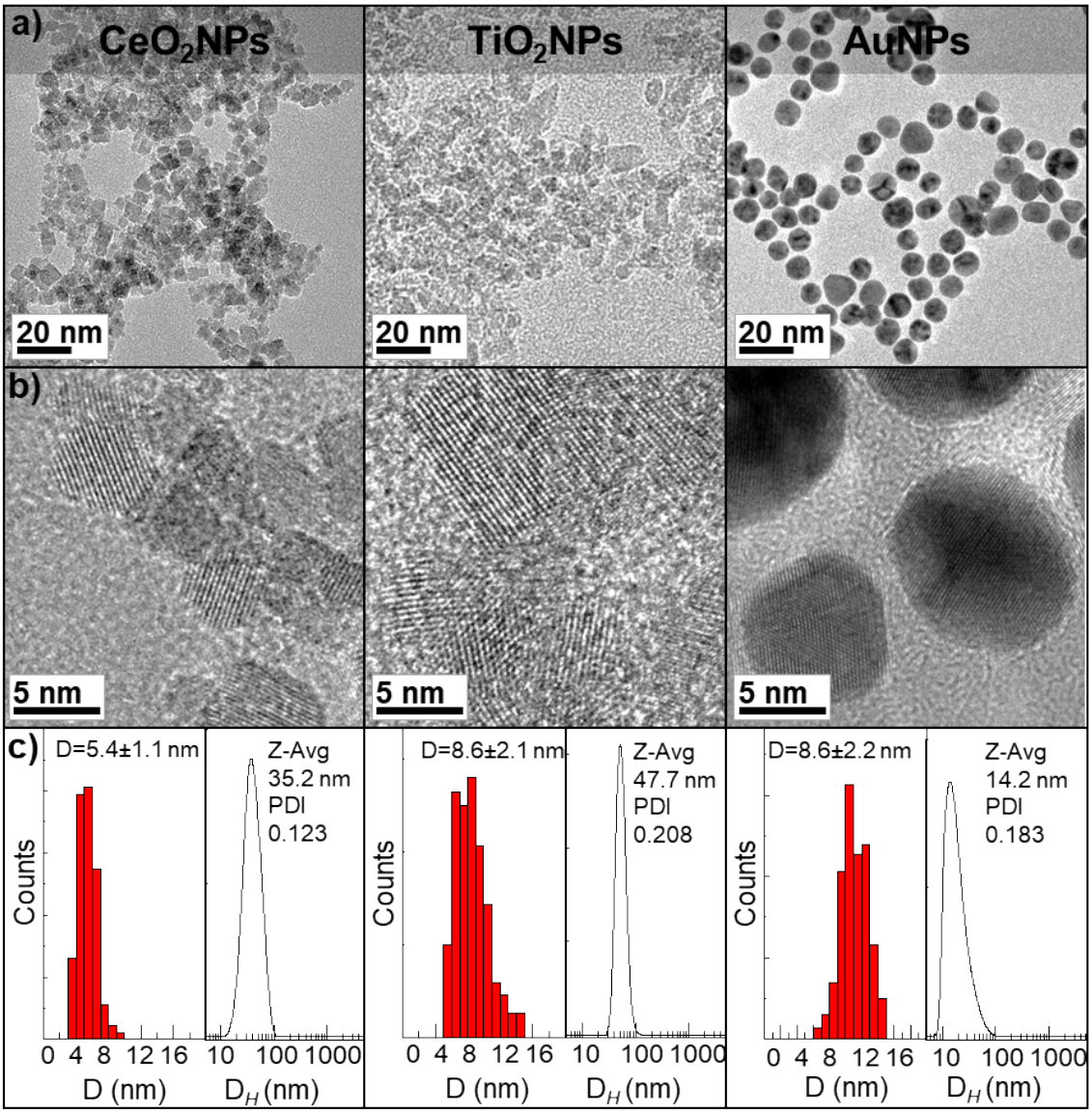

Figure 1. Characterization of the single component NPs used in this work. *a) TEM images at low magnification; b) HR-TEM images; c) TEM image analysis using image J software (left panels) and hydrodynamic diameters measured by DLS (intensity distribution).*

Figure S2. XRD characterization of the Au/TiO_2 hybrid nanostrucutures.

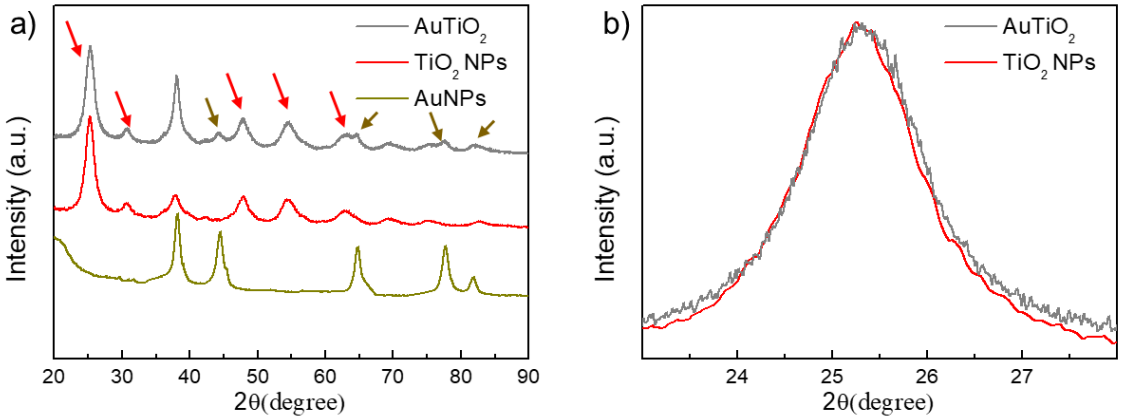

Figure S2. XRD characterization of the CeO_2/TiO_2 hybrid nanostrucutures. a) Two series of sets of diffraction peaks are present in the Au/TiO_2 hybrid, indicated with arrows with the same colour as the single component NPs. The peaks are assigned to the fluorite(cubic) TiO_2 phase (JCPDS No 21-1272; red line) and to the cubic Au phase (JCPDS No 04-0784; orange line). The diffraction peaks of the AuNPs are sharp and intense, while those of TiO_2NPs are broad and weak, which is in agreement with the small crystalline size of the TiO_2NPs. **b)** Detail of the (101) reflection of the TiO_2NPs and in the Au/TiO_2 hybrids which shows the similar crystalline size in both cases **(Table S1)**.

Figure S3. Effect of photocatalyst loading.

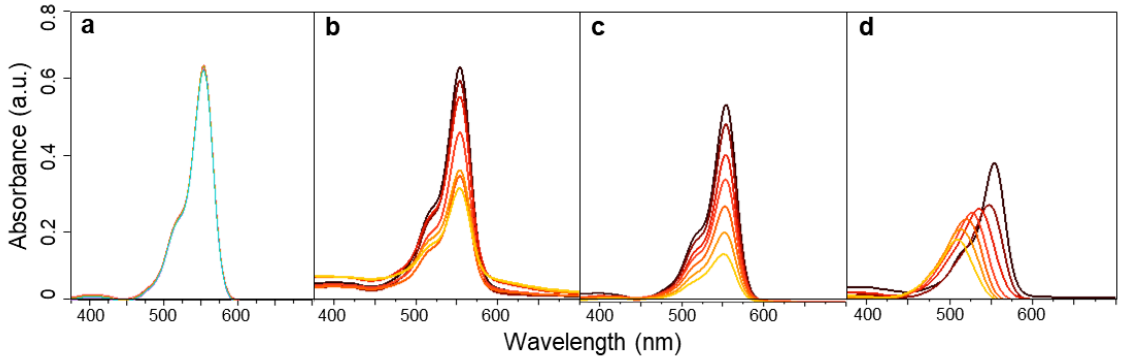

Figure S4. Effect of photocatalyst loading for the degradation of RhB. Initial RhB concentration is 2.5mM. Varying concentrations of TiO_2NPs are 0.005 **(a)** 0.05 **(b)** 0.5, **(c)**, and 5 mg/mL **(d)**.

Figure S4. Molecular structures of CIP and SMX.

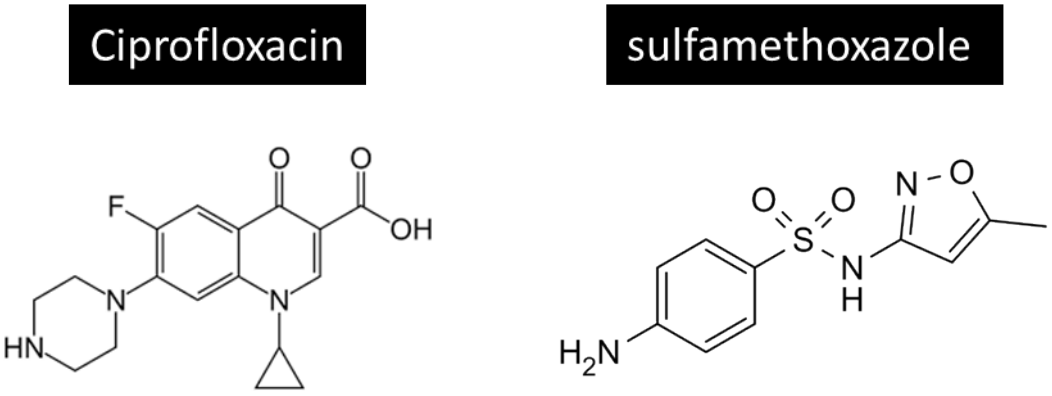

Table S1. Physicochemical characteristics of all nanomaterials employed in this work.

	Scherrer size *(nm)*	TEM size *(nm)*	DLS size *(nm)*	E*g* *(eV)*
Au	7.32	8.6	14.2	
CeO_2	4.81	5.4	35	3.55
TiO_2	6.08	8.6	47	3.52
Au/TiO_2	6.17		152	3.34
CeO_2/TiO_2	5.12		168	3.01