Electronic Supporting Information

Crystal Defect Induced Facet Dependent Electrocatalytic Activity of 3D Gold Nanoflower towards the Selective Nanomolar (*nM*) Detection of Ascorbic Acid

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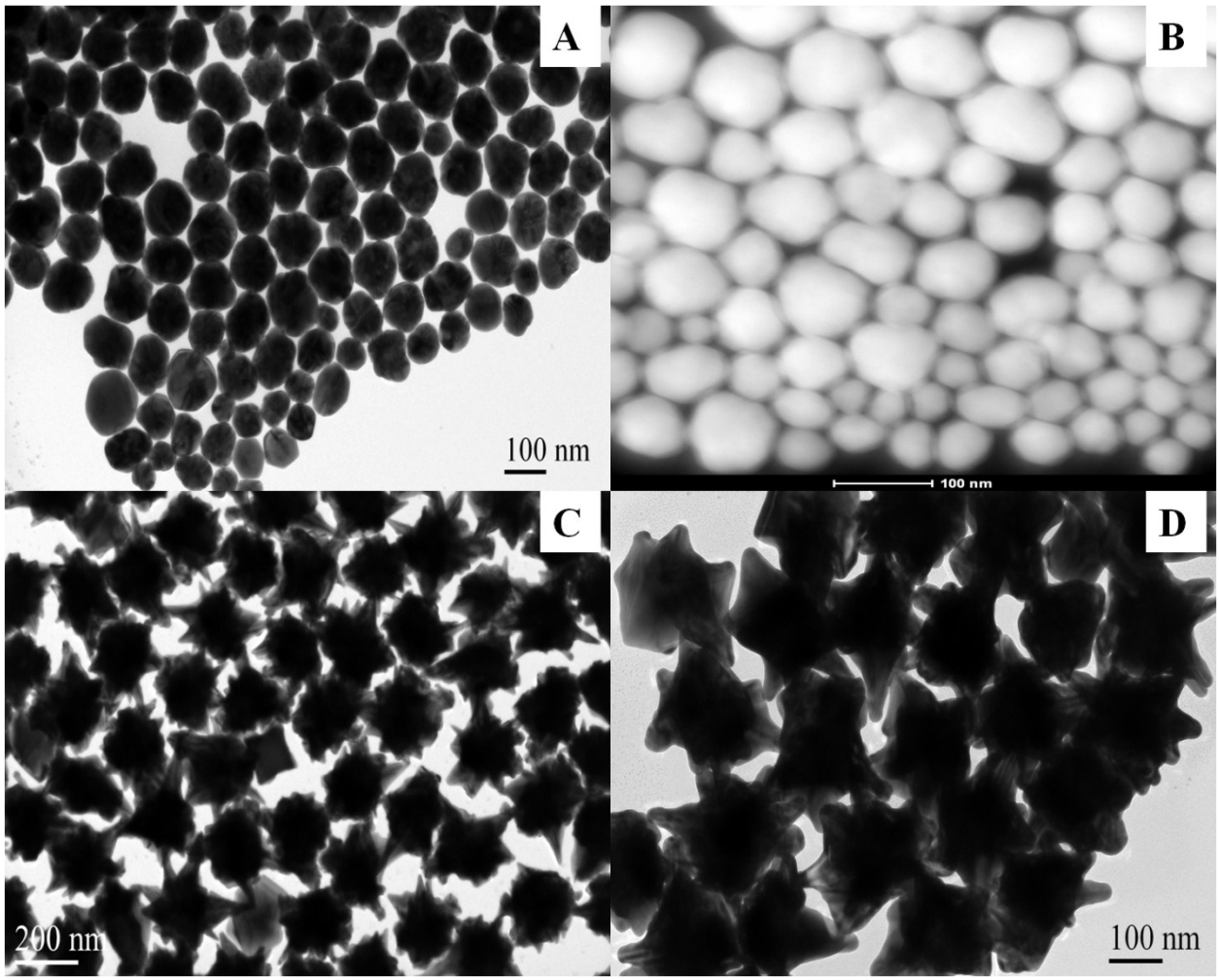

Figure S1: TEM images of AuNFs synthesized using (A) 2.8×10^{-4}M CTAB (bud shape), (C) 2.8×10^{-2}M CTAB and (D) 8.4×10^{-2}M CTAB. (B) HAADF image of same bud shaped AuNF shown in (A).

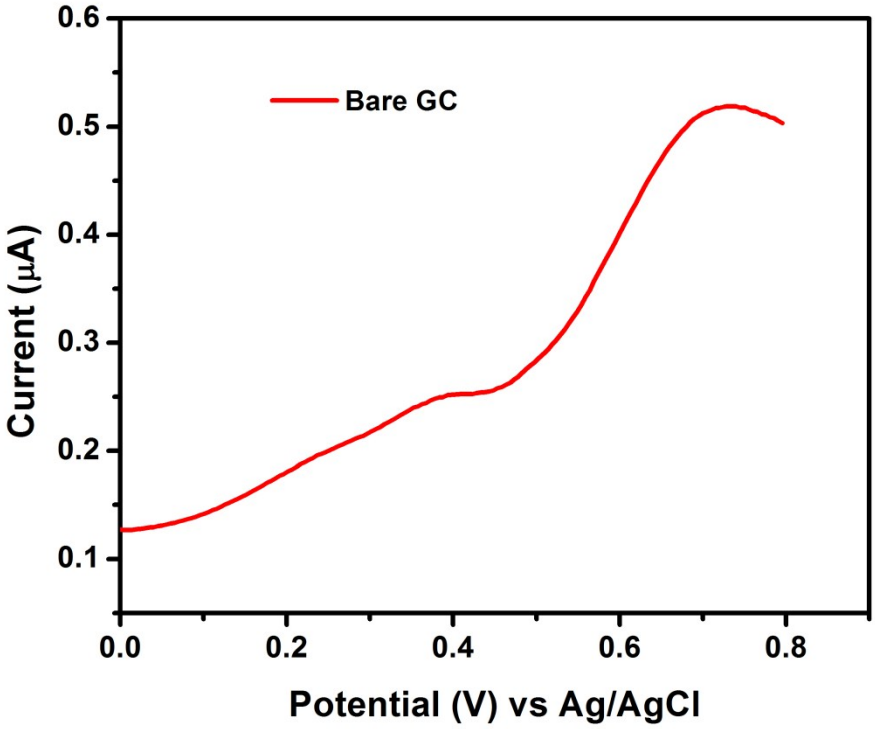

Figure S2: Differential pulse voltammogram of 4×10^{-4} M AA at bare GC electrode in 0.1M $HClO_4$ solution.

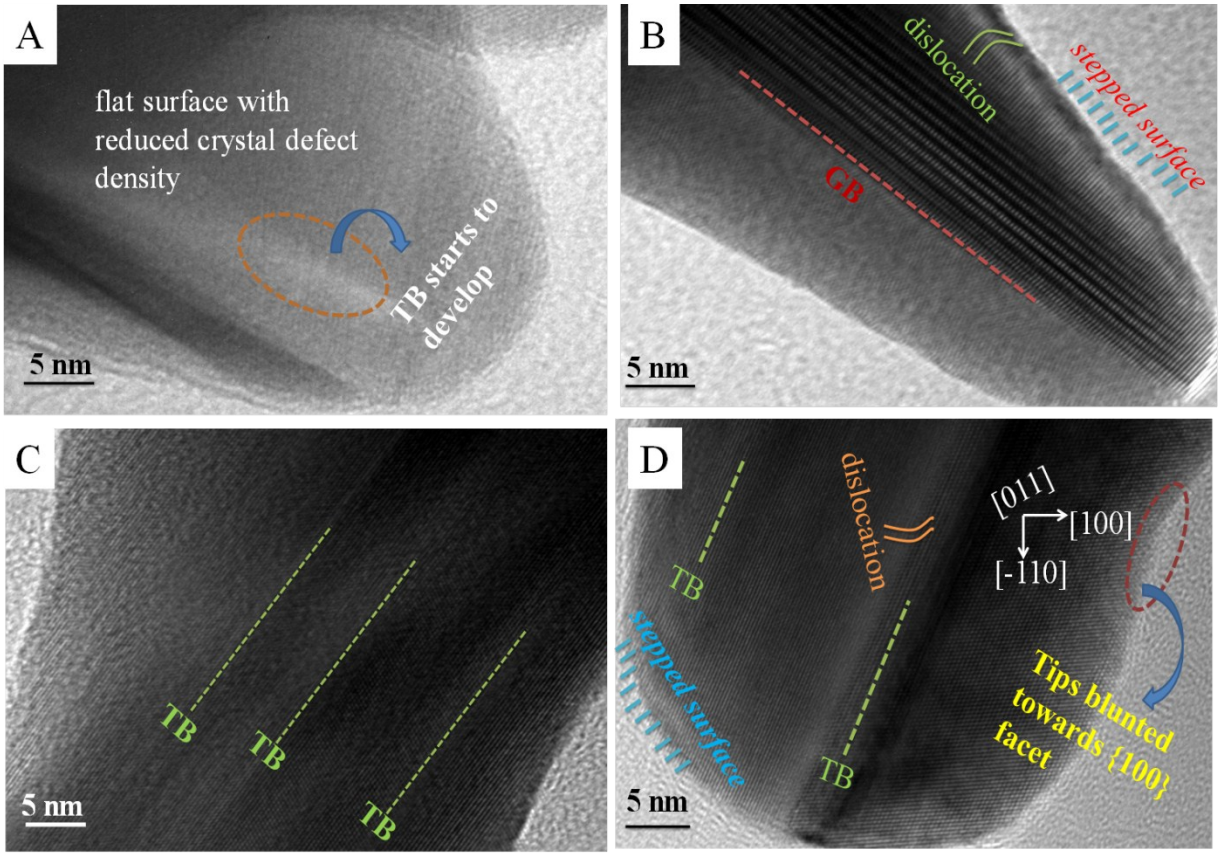

Figure S3: (A) AuNF synthesized at 2.8×10^{-3}M CTAB with reduced crystal defect density (B) AuNF synthesized at 2.8×10^{-2}M CTAB with enhanced crystal defects (C) Fully blossomed AuNF prepared at 5.6×10^{-2}M CTAB shows only Twin Boundary (TB) defects (D) Overgrown AuNF produced at 8.4×10^{-2}M CTAB exhibit blunted tips towards energetically unfavorable {100} facet.

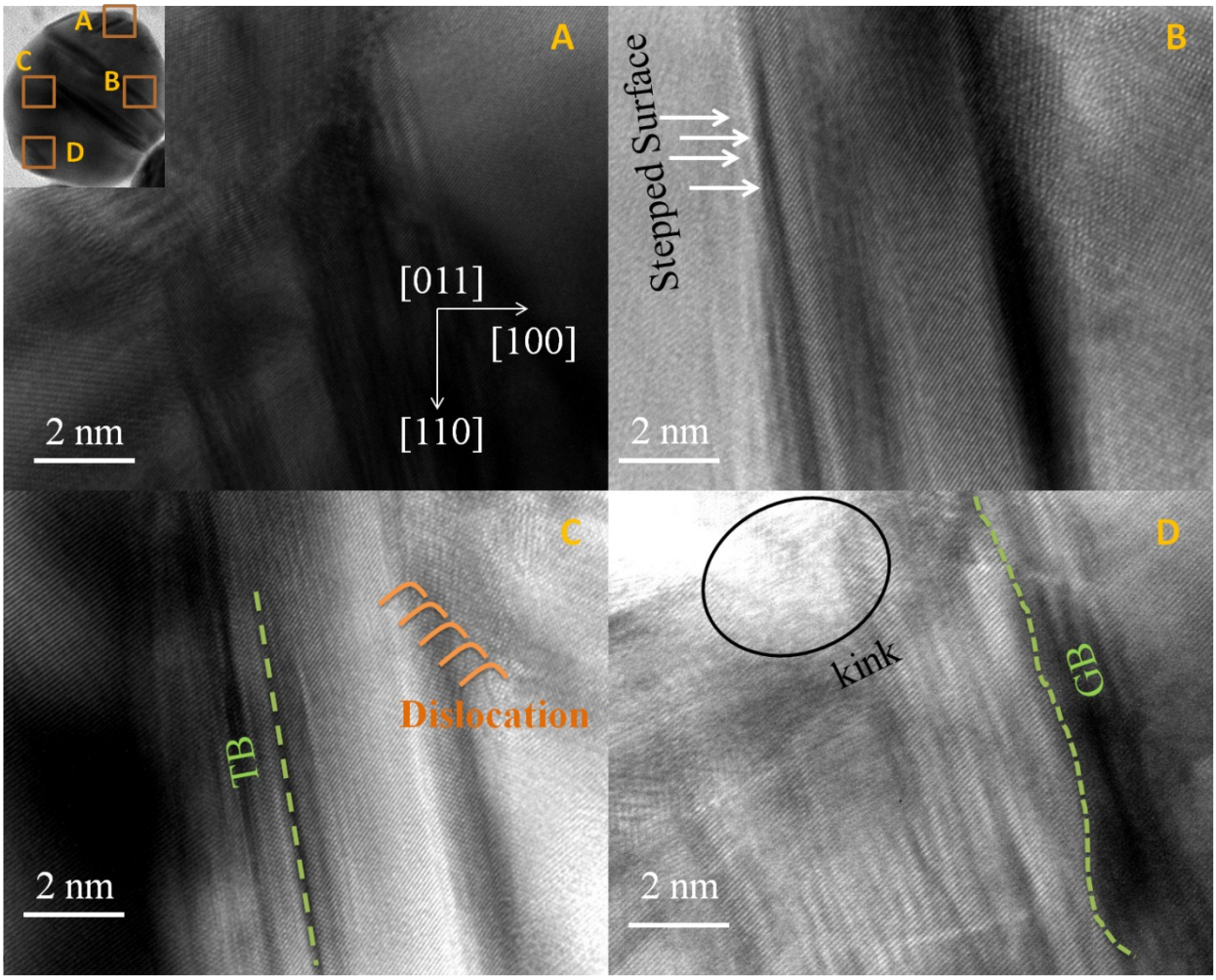

Figure S4: HRTEM image of the bud shaped AuNF. Different part of the bud structure is focused where (A) indicates direction of the growing tips towards {110},and (B), (C), (D) indicates the presence of multiple crystal defects like stepped surface, GB, TB, Dislocation, etc.

Table S1: Physical and electrostatic parameters of synthesized different flourishing stages of AuNFs.

AuNFs at CTAB concentrations (M)	AuNF core dia. (nm)	Individual average petal length (nm)	Average number of petals	Zeta potential (+mV)
2.8×10^{-4}	110	0	0	11.9
2.8×10^{-3}	140	15	15	18.1
2.8×10^{-2}	155	85	54	27.3
5.6×10^{-2}	140	105	68	31.9
8.4×10^{-2}	135	70	45	34.8