

## Supplementary information

# Electrostatic and covalent binding of an antibacterial polymer to hydroxyapatite for protection against *Escherichia coli* colonization

Sudip Chakraborty <sup>1</sup>, Georgio Katsifis <sup>2</sup>, Iman Roohani <sup>1,3,4</sup>, Cyrille Boyer <sup>5</sup>, David McKenzie <sup>2,3</sup>, Mark D. P. Willcox <sup>6</sup>, Renxun Chen <sup>1,\*</sup>, Naresh Kumar <sup>1,\*</sup>,

<sup>1</sup> School of Chemistry, UNSW Sydney, 2052, Kensington, NSW, Australia;

<sup>2</sup> School of Physics, University of Sydney, Sydney, NSW 2006, Australia;

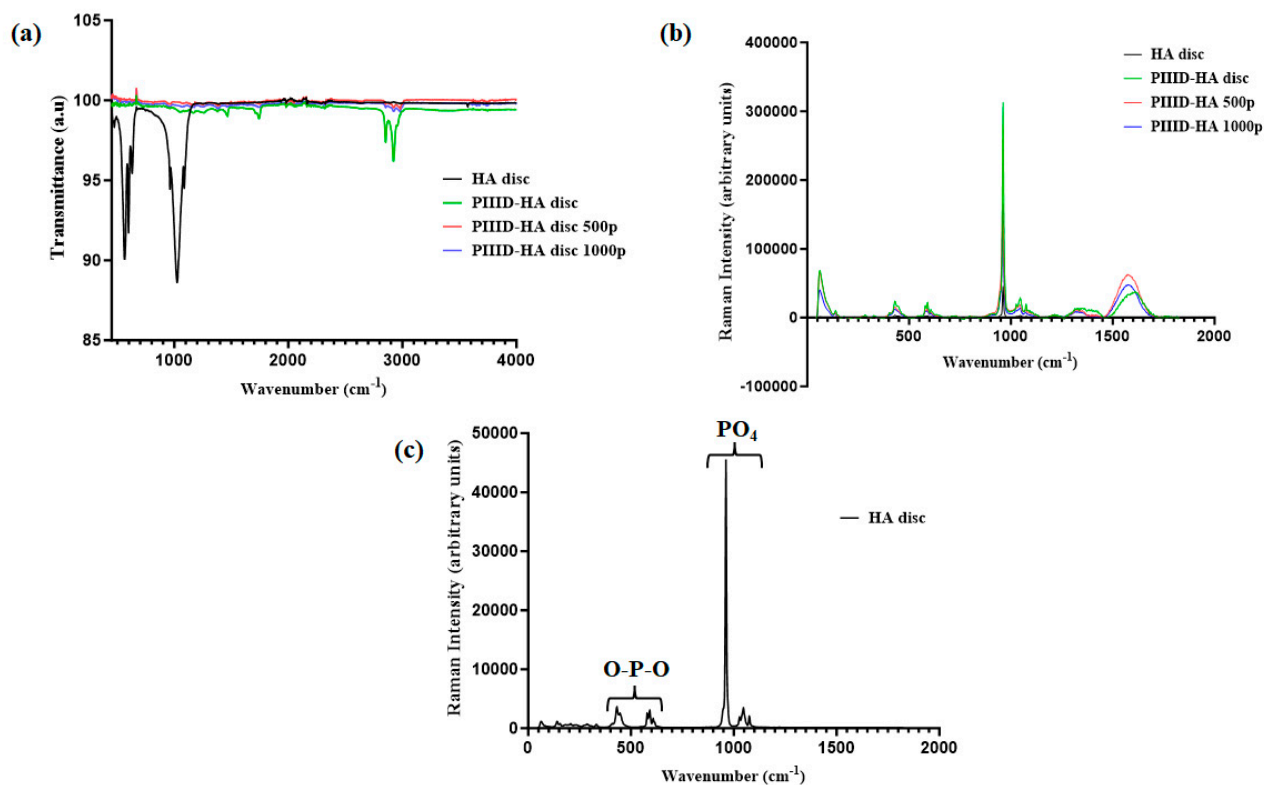
<sup>3</sup> Charles Perkins Centre, University of Sydney, Sydney, NSW 2006, Australia;

<sup>4</sup> School of Life and Environmental Sciences, University of Sydney, Sydney, NSW 2006, Australia

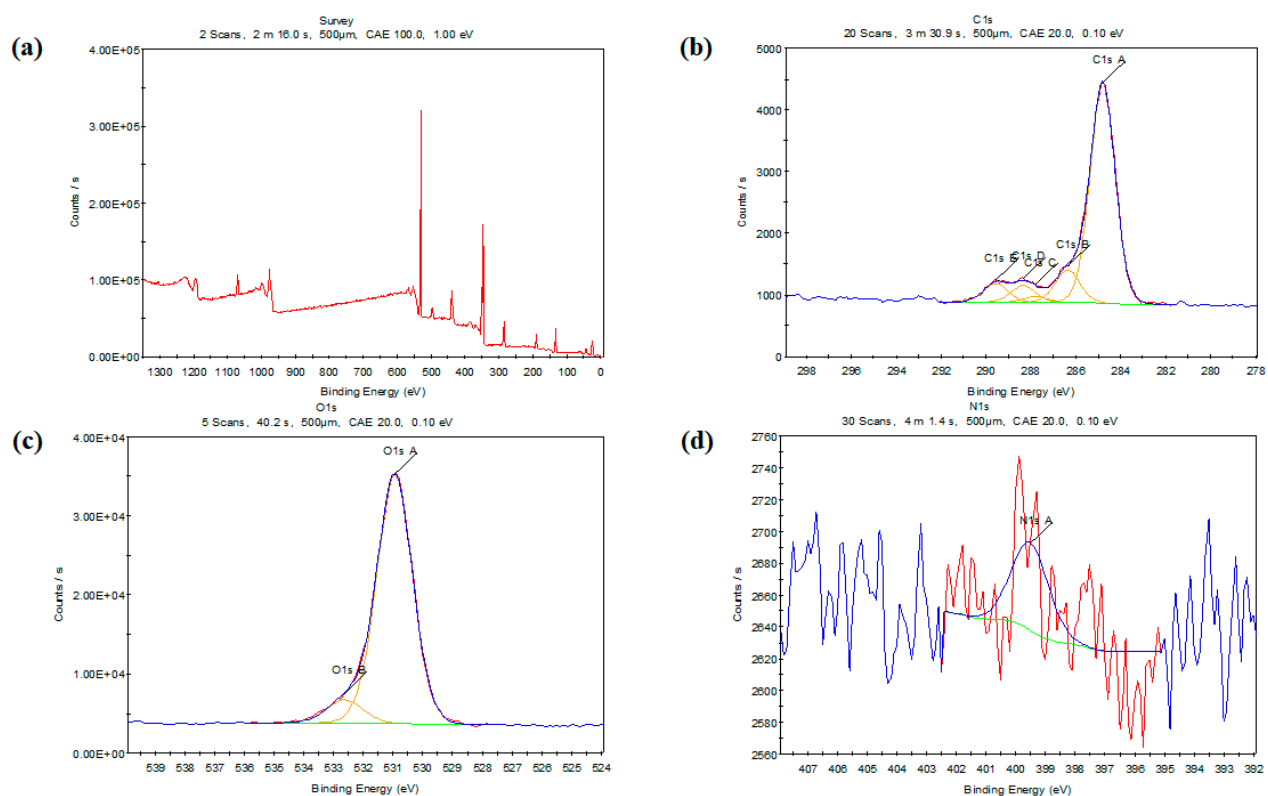
<sup>5</sup> School of Chemical Engineering, UNSW Sydney, 2052, Kensington, NSW, Australia;

<sup>6</sup> School of Optometry and Vision Science, UNSW Sydney, 2052, Kensington, NSW, Australia.;

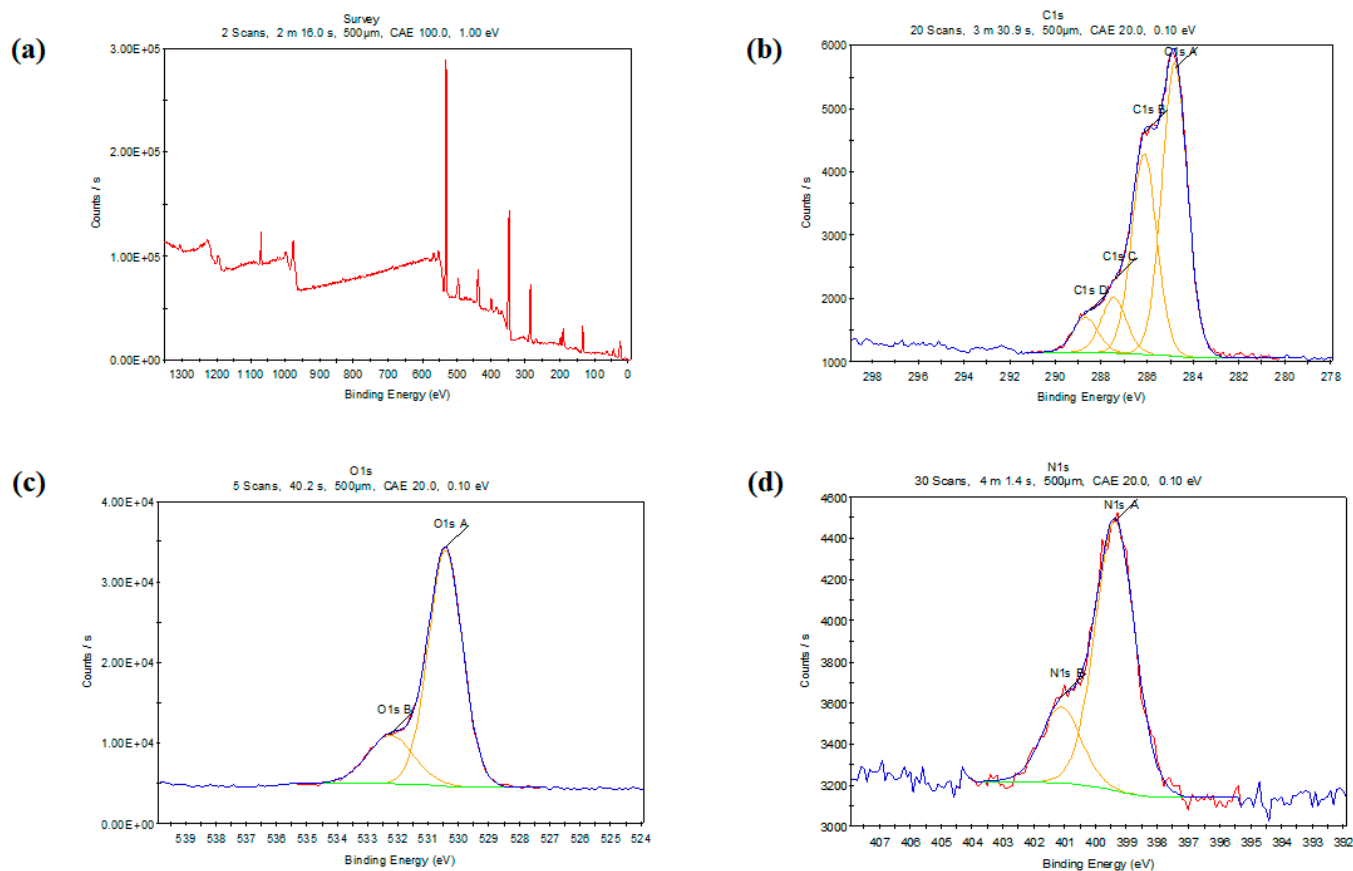
\* Correspondence: r.chen@unsw.edu.au (RC); n.kumar@unsw.edu.au (NK)



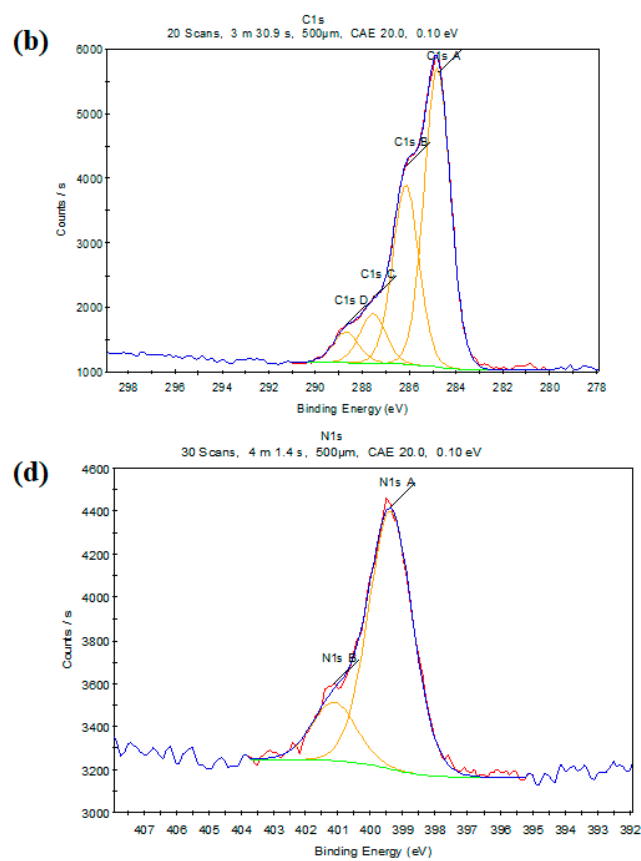
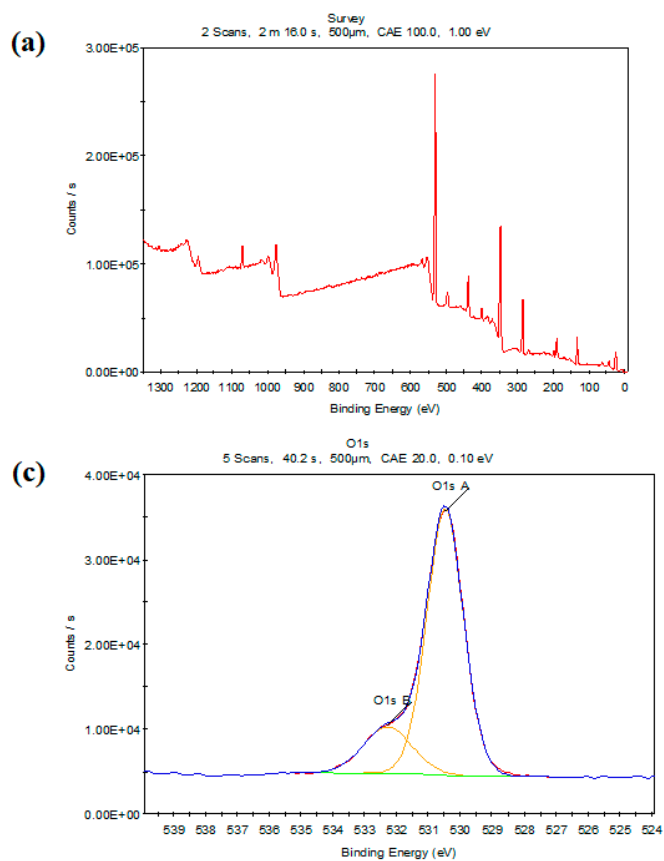
**Figure S1. (a) FT-IR spectra of HA disc, PIID-HA disc, PIID-HA 500p, and PIID-HA 1000p spanning the entire range of detection (45-4000  $\text{cm}^{-1}$ ), (b) RAMAN spectra of HA disc, PIID-HA disc, PIID-HA 500p, and PIID-HA 1000p spanning the entire range of detection (50-1800  $\text{cm}^{-1}$ ), (c) RAMAN spectra of pure HA disc spanning the entire range of detection (50-1800  $\text{cm}^{-1}$ )**



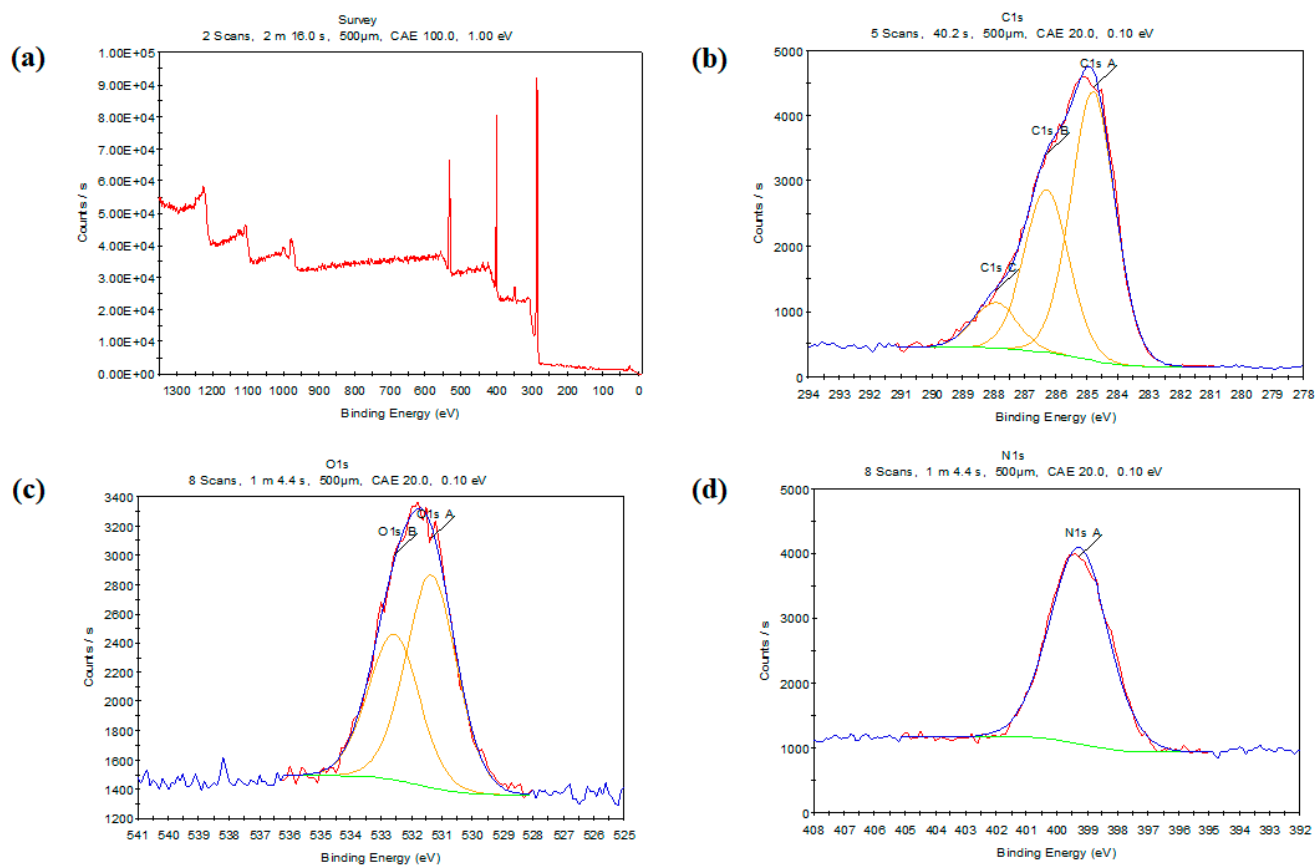
**Figure S2. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C1s, (c) O1s, and (d) N1s species of HA discs**



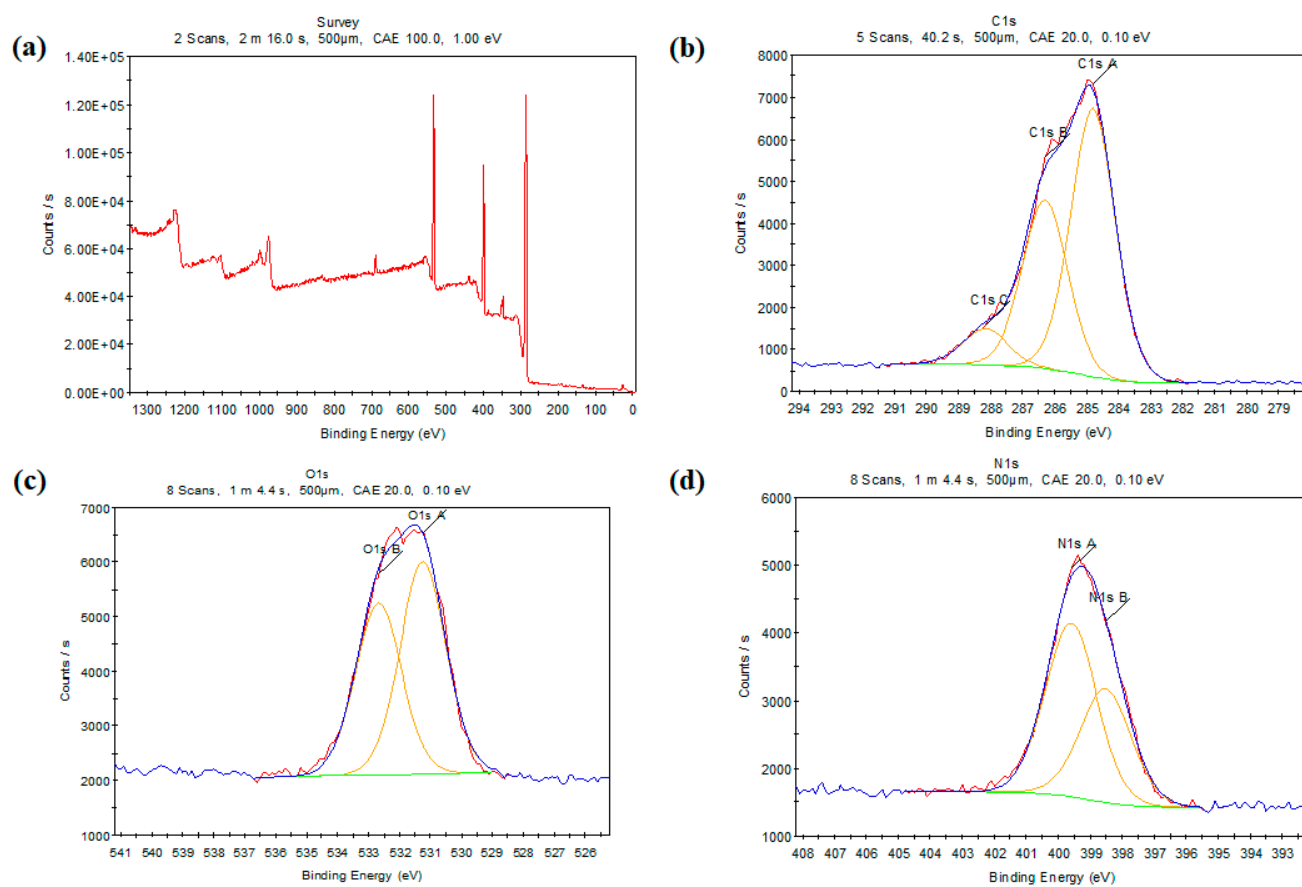
**Figure S3. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C1s, (c) O1s, and (d) N1s species of HA 500p**



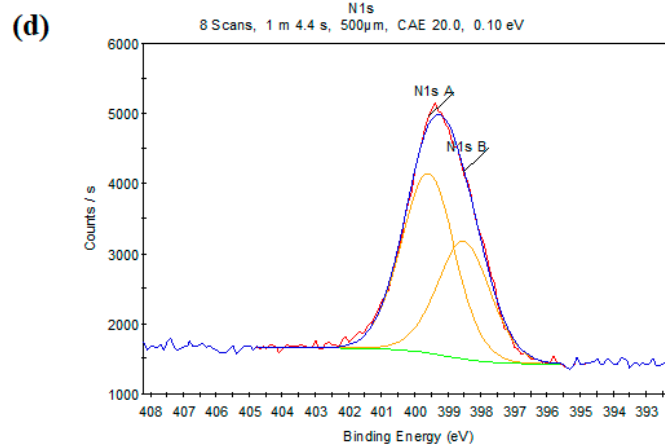
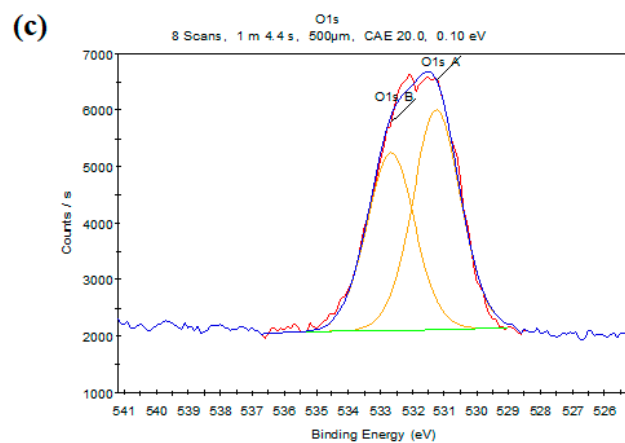
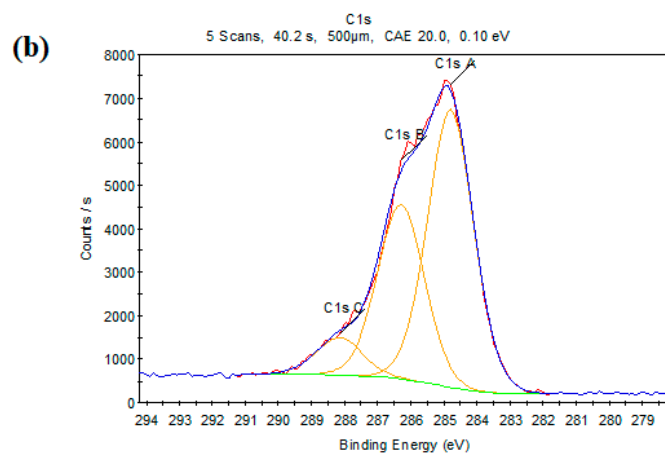
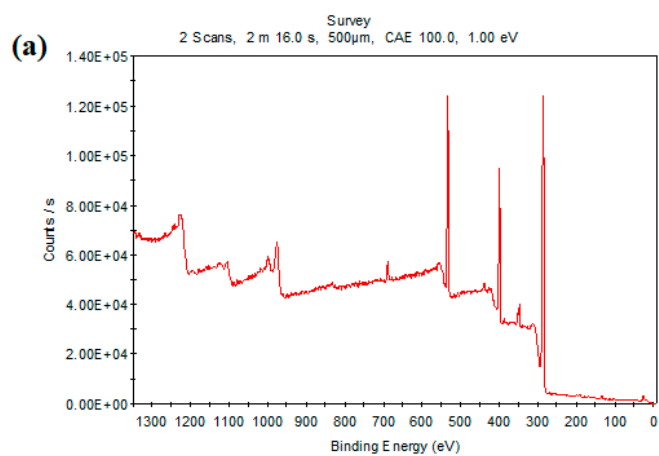
**Figure S4. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C1s, (c) O1s, and (d) N1s species of HA 1000p**



**Figure S5. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C1s, (c) O1s, and (d) N1s species of PIHD-HA discs**



**Figure S6. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C1s, (c) O1s, and (d) N1s species of PIID-HA 500p**



**Figure S7. (a) XPS spectrum and peak-differentiation-imitating analysis of (b) C 1s, (c) O 1s, and (d) N 1s species of PIID-HA 1000p**