

**Whole genome sequence analysis reveals high genetic variation of newly isolated
Acidithiobacillus ferrooxidans IO-2C**

Anila Fariq^{1, 2}, John C Blazier³, Azra Yasmin¹, Terry J. Gentry², Youjun Deng²

1 Microbiology & Biotechnology Research Lab, Department of Biotechnology,

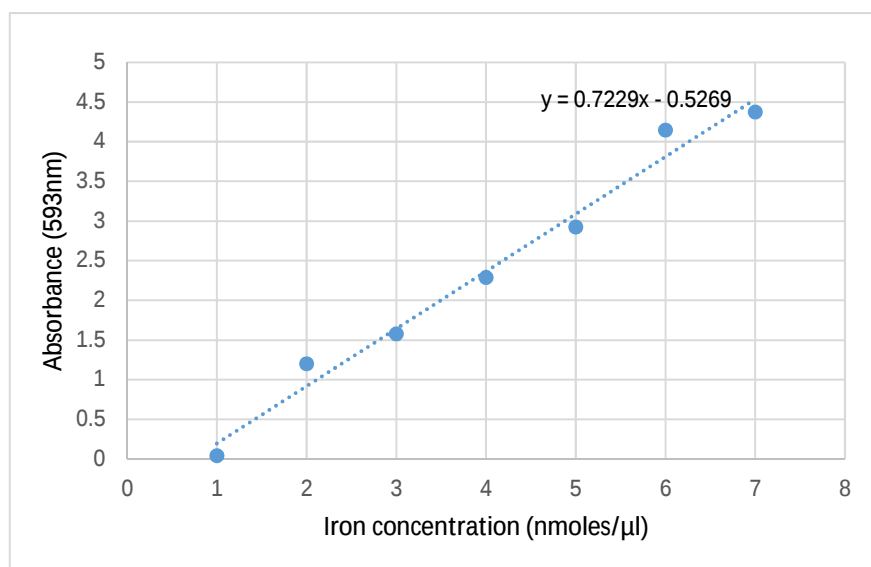
Fatima Jinnah Women University, Rawalpindi, 46000, Pakistan

2 Department of Soil and Crop Sciences, Texas A&M University, College Station, TX, 77843,
USA

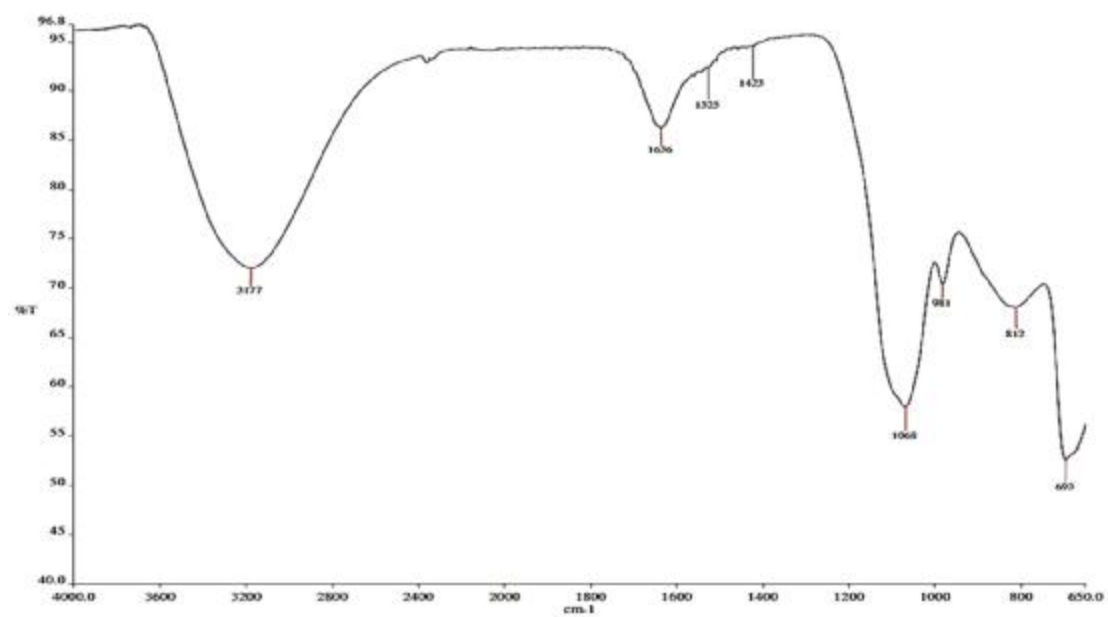
3 Texas A&M Institute of Genome Sciences and Society, Texas A&M University, College Station,
TX, 77843, USA

***Corresponding author**

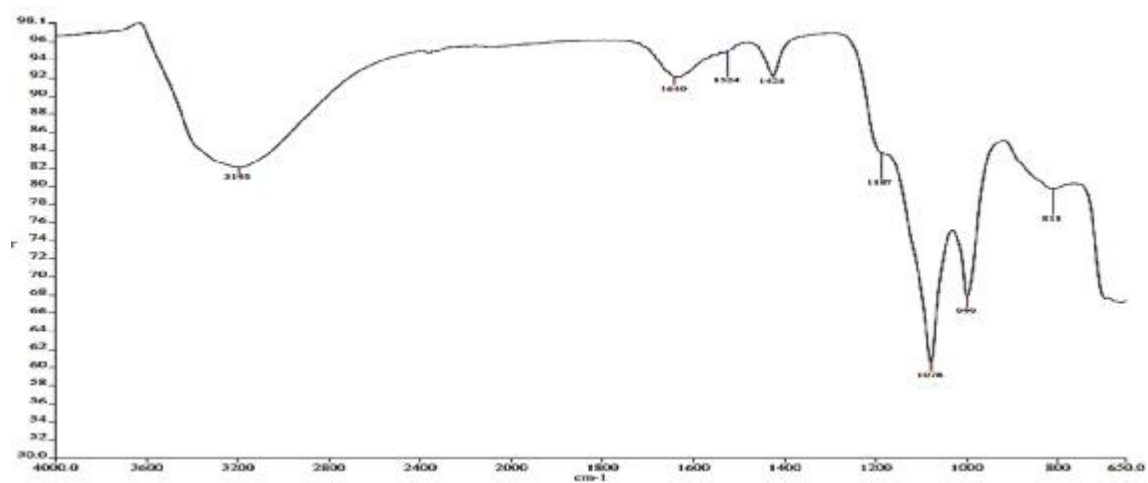
Email: azrayasmin@fjwu.edu.pk



Supplementary Fig. 1. Iron Standard Curve

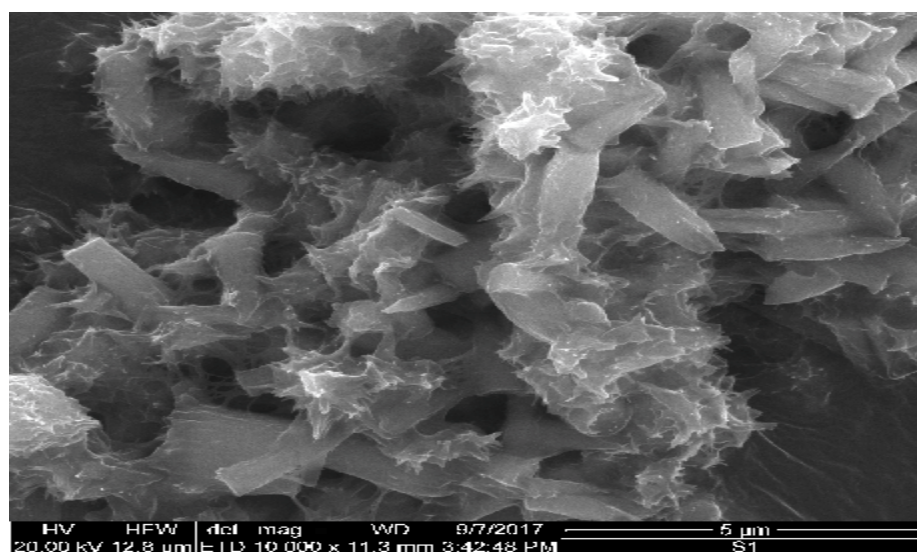


a)

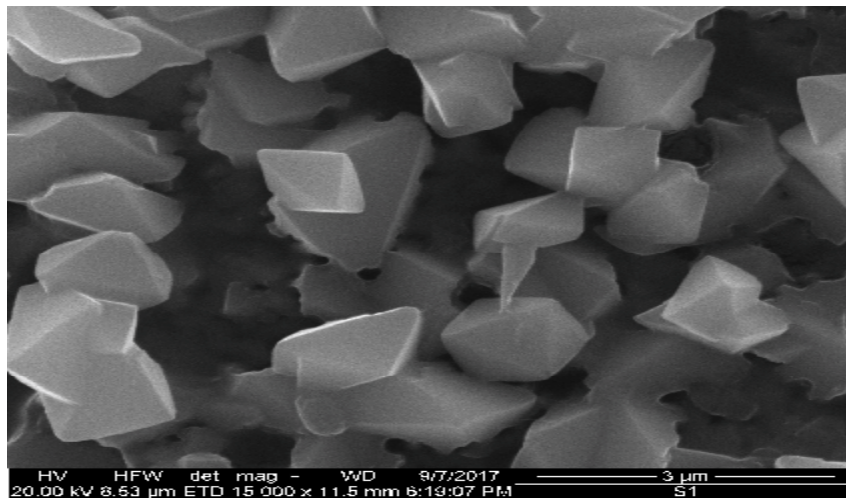


b)

Supplementary Fig. 2. IR spectra of iron oxides produced by *Acidithiobacillus ferrooxidans* IO-2C using a) FeSO_4 b) $\text{Fe}(\text{NH}_4)_2\text{SO}_4$ as substrates

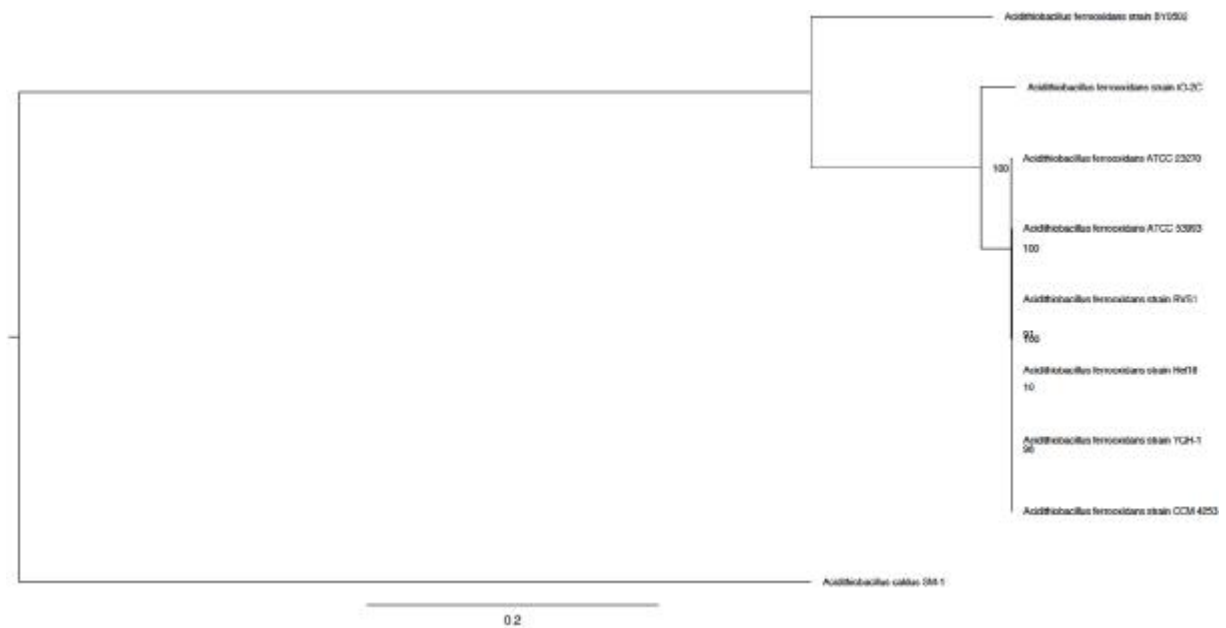


a)

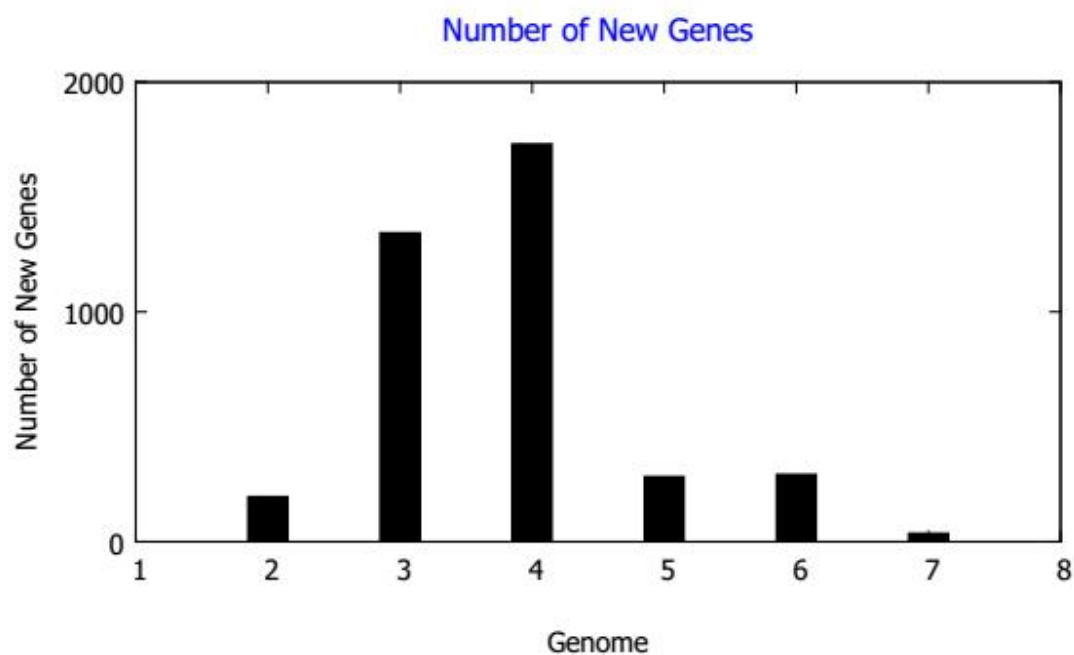


b)

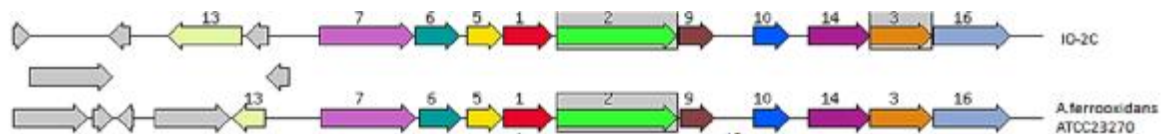
Supplementary Fig. 3. SEM images of iron oxides produced by *Acidithiobacillus ferrooxidans* IO-2C using a) FeSO_4 b) $\text{Fe}(\text{NH}_4)_2\text{SO}_4$ as substrates



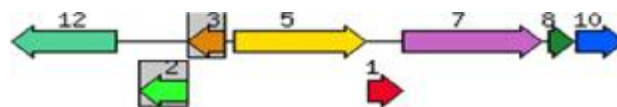
Supplementary Fig. 4. Phylogenetic tree of eight *Acidithiobacillus ferrooxidans* species and outgroup *Acidithiobacillus caldus*.



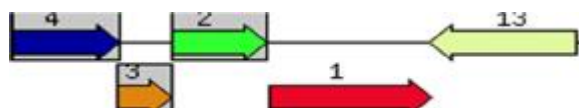
Supplementary Fig. 5. Number of new genes contributing to pan-genome



Supplementary Fig. 6. Assembly of iron oxidizing proteins in IO-2C and *A. ferrooxidans* ATCC23270. 10 rusticyanin related protein, 9 Cytochrome C oxidase polypeptide III, 14 Cytochrome C oxidase assembly factor, 3 CoX10-CtaB, 1 Cytochrome C oxidase polypeptide II, and 2 Cytochrome C oxidase polypeptide I



Supplementary Fig. 7. Organization of arsenic resistance determinants in IO-2C genome. 1 Arsenic resistance protein ArsH, 2 Arsenate reductase, 3 Transcriptional regulators, ArsR family, 5 Arsenic efflux pump protein, 7 Signal recognition particle, subunit Ffh SRP54, 8 SSU ribosomal protein, 10 16S rRNA processing protein 12 Membrane anchor protein YbhG



Supplementary Fig. 8. Determinants of copper resistance in IO-2C genome. 1 copper homeostasis protein CutE, 2 Magnesium and cobalt efflux protein CorC, 3 Metal dependent hydrolase, 4 Predicted ATPase, 13 TldE protein, 16 Zinc ABC transporter