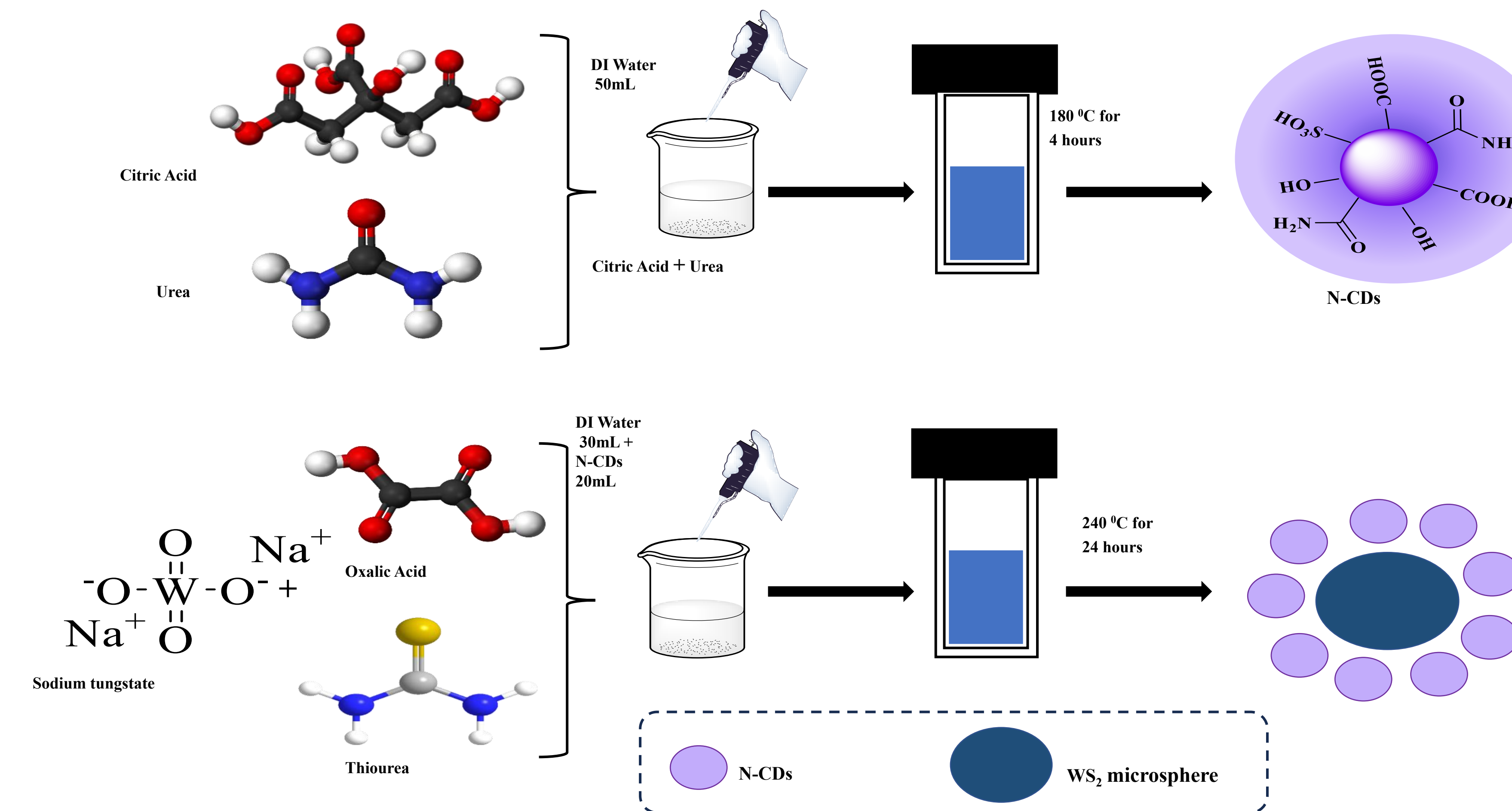


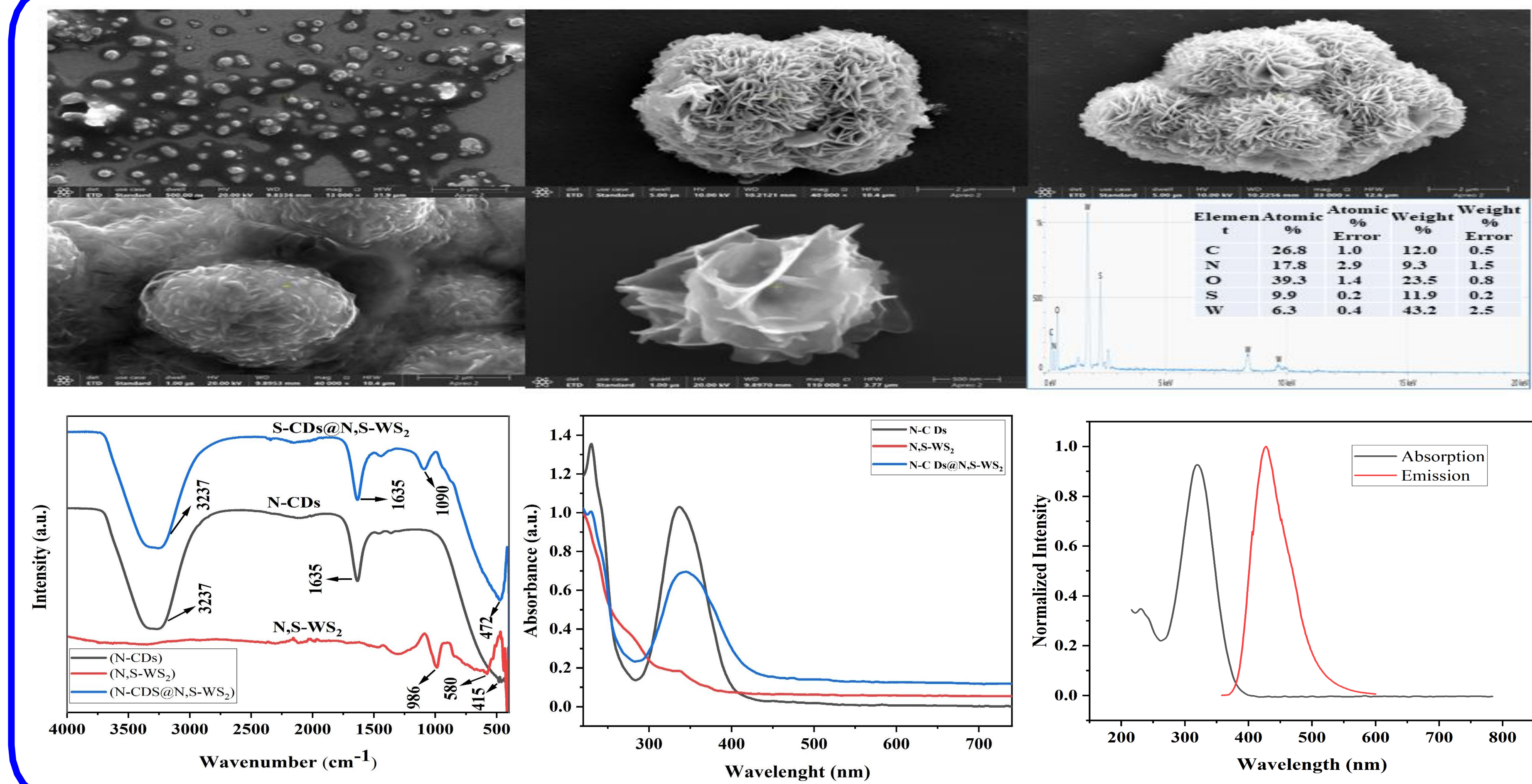
Background

- Antibiotics play a crucial role in treating bacterial infections and improving global health.
- Secnidazole, a second-generation nitroimidazole, is highly effective in treating bacterial vaginosis, amoebiasis, and giardiasis.
- Traditional analytical methods (HPLC, GC-MS, spectrophotometry) are expensive, time-consuming, and require expertise.
- A rapid, cost-effective, and user-friendly detection platform is needed for secnidazole analysis.
- First-ever development of an N-CDs@N,S-WS₂-based fluorescent sensor for secnidazole detection.
- Microfluidics paper device assisted Smartphone detection for real-time, point-of-care monitoring.

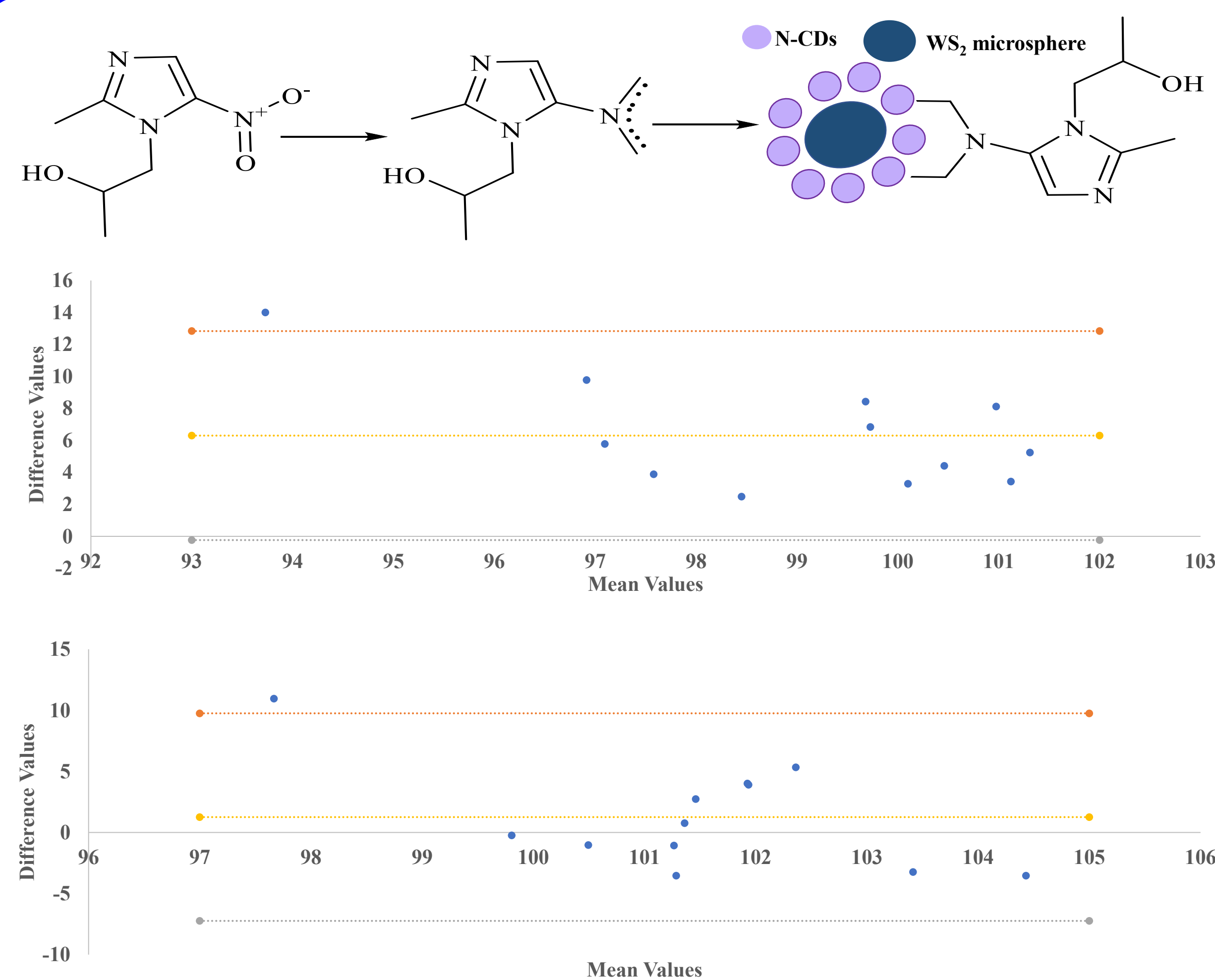
Strategy



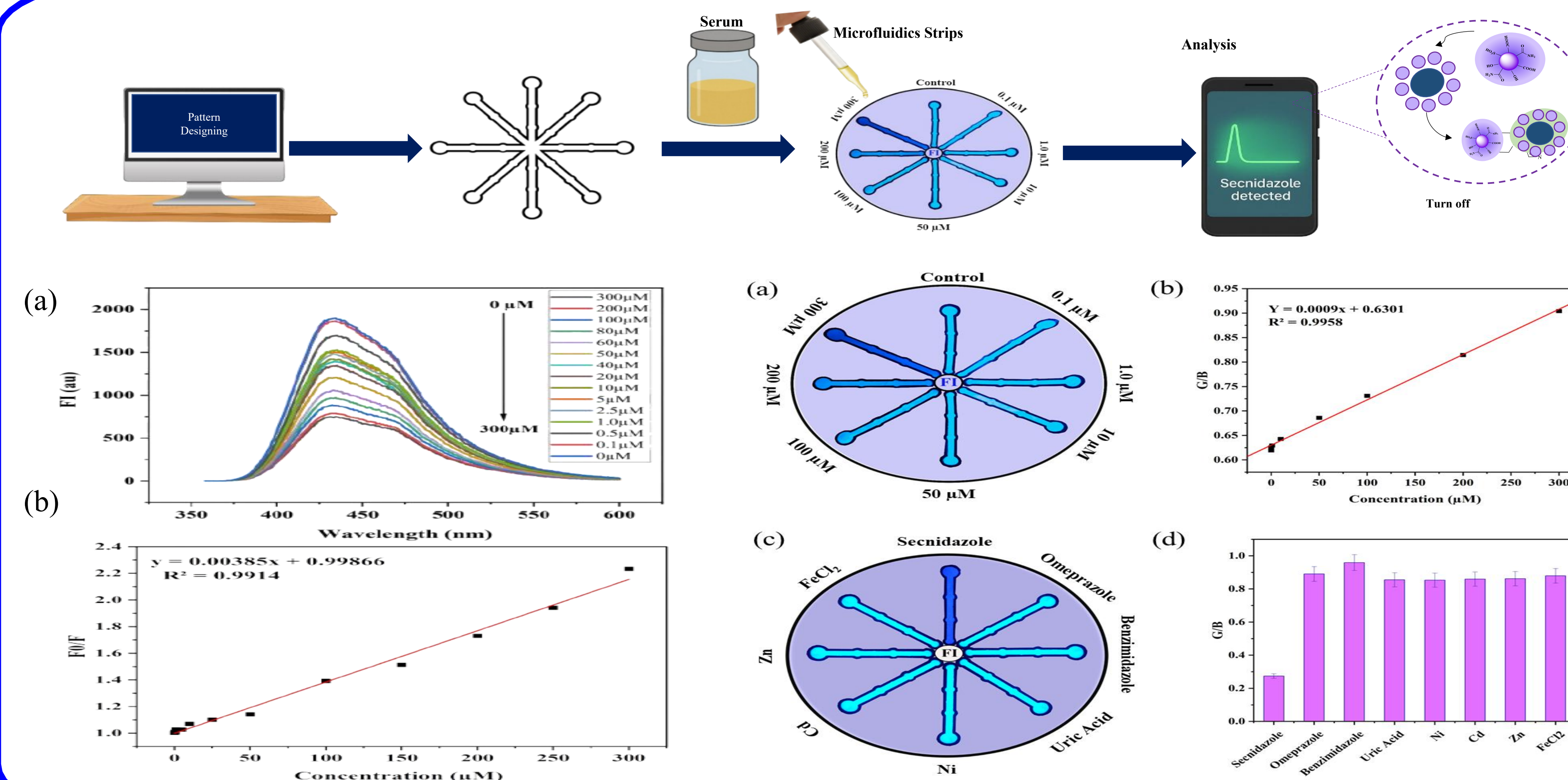
Morphology and Characterization



Sensing Mechanism and Method Validation



Smart Phone Assisted μ PAD for Onsite Detection



Outcomes

- A microfluidic paper-based device integrated with a smartphone sensing platform was successfully developed.
- Enables real-time, onsite, and instrument-free detection of secnidazole with high sensitivity.
- The N-CDs@N,S-WS₂ composite demonstrated a strong fluorescence quenching effect in the presence of secnidazole.
- Limit of Detection (LOD): 0.117 μ M (117 nM) and Limit of Quantification (LOQ): 0.3573 μ M (357 nM).
- The sensor effectively detected secnidazole in human serum, demonstrating real-world applicability.
- The detection efficiency of the N-CDs@N,S-WS₂-based fluorescent sensor was validated using UPLC and LCMS.

References

- S Arif , SG Musharraf, dilshad hussain--- Biosensor and Bioelectronics 2025
- S Rasheed, K Hussain, S Arif, AR Umar, SB Anwar... - Food Chemistry, 2024.
- S Rasheed, MA ul Haq, N Ahmad, D Hussain - Food Chemistry, 2023.