**Aim: Synthesis of Carbon quantum dots from garlic peels:**

**Materials required:** Garlic peel from agro-waste was purchased from various vegetable dealers in Uttar Pradesh, India, Double distill water ……………..………

**CQDs Synthesis.** CQDs were synthesized by a hydrothermal process that was carried out in a normal laboratory setting.The garlic peel was thoroughly washed in double-distilled water to remove any impurities. The washed peel was then dehydrated at 60˚ Celsius in a hot air oven until completely dried. Nest, the dried peels were ground into a powder after being given a blast of liquid nitrogen. Following sonication, 15 ml of the precursor was transferred to a 40 ml stainless steel autoclave that has been lined with Polytetrafluoroethylene PTFE. The autoclave is then heated at 180 °C for four hours under autogenous pressure. After cooling down, the resulting cake (c), which had a dark black hue and was a crude product, was washed with deionized water and filtered through several grade Gooch crucibles. The obtained filtrate was sonicated for two hours and subsequently dried in a hot-air oven to produce CQDs. Synthesis parameters were optimized by varying temperatures and time points.

**Antibacterial Assay**

**Preparation of bacterial suspension:**

E. coli (MTCC 1302) and S. aureus (MTCC 96) were purchased from CSIR-IMTech, Chandigarh, India. E. coli (gram negative) and S. aureus (gram positive) stock cultures were sub-cultured separately onto plates and kept for overnight incubation at 37 °C. After incubation a single bacterial colony was inoculated into 5 mL sterile Luria Bertani (LB) broth and incubated at 37°C overnight. Later the overnight bacterial suspension was adjusted to the 108 CFU/mL with sterile LB broth.

**Preparation of test sample extracts:**

The sterilized powder (5 mg) of HS and AHS were dissolved in 5 mL of LB broth at kept at 37 °C in incubator shaker. After 48 h, the hydrogel particles were removed with the help of a sterilized spatula and remaining solution underwent filter sterilization utilizing a 0.22 μm syringe filter.

**Evaluation of antibacterial activity of test samples:**

To demonstrate the inhibition effects of the HS and AHS extracts against E. coli and S. aureus, we adopted spread plate method by counting the colony forming units (CFU) of bacteria grown in agar plates. Both the bacterial cells were cultured in LB broth till the OD600 value reaches 0.06 (108 CFU/mL). Cells were adjusted to 106 CFU/mL and then mixed with serially diluted test sample extracts (100 – 12.5 μg/mL) and incubated for 12 h at 37 °C. Dilutions were performed in triplicates in glass tubes for each test samples. After incubation 100 μL cells from each tube were spread on LB agar and plates were further incubated for 16 h at 37 °C. CFUs counted from untreated cells were measured 100% and decrease in CFUs for HS and AHS-treated cells at serially diluted concentrations were presented.