# California Institute of Technology Develops Catheter with Shark-Fin Spikes to Combat Urinary Tract Infections



Researchers at the California Institute of Technology have developed a new catheter designed to significantly reduce urinary tract infections in hospital patients. This catheter features thousands of tiny shark-fin-shaped spikes on its interior surface, which hinder bacteria from traveling up the catheter into the urinary tract. The spikes, nearly invisible to the naked eye, are oriented to trap bacteria, which are then flushed out by the flow of urine.

Urinary tract infections are a common issue for patients with catheters, with an estimated 50,000 incidents annually in NHS hospitals, costing around £200 million per year to treat. These infections occur as bacteria form a slimy film inside the catheter, ultimately reaching the bladder. Current catheters often incorporate antibiotics or metals like silver to combat this issue, but bacteria are increasingly developing resistance.

The shark-fin spikes emerged as a solution from AI-driven research, where different surface textures were simulated to determine the most effective at preventing bacterial spread. The prototype, tested using a 3D printer against E. coli bacteria, showed a bacterial build-up of less than 1% compared to traditional catheters over a 24-hour period. The findings were published in the journal Applied Sciences, and clinical trials are expected to commence soon.

Despite the positive outcomes, Chris Eden, a professor of urology at the Royal Surrey County Hospital, expressed caution, noting that some bacteria might behave differently than the E. coli used in tests and might not be as effectively managed by this new design.