

# New material with controllable antibacterial effect



## CUTTING EDGE TECHNOLOGY

- Unique nanocomposite material, polymer /carbon quantum dots (CQDs), characterized by a controllable antibacterial effect that is activated by the action of blue light (e.g. using a conventional blue LED diode),
- After irradiation of this material with a conventional blue LED diode, singlet oxygen molecules are produced which effectively disrupt bacterial membranes in a short time.

## COMPETITIVE ADVANTAGE

- **Lower production costs** of the material compared to antibacterial agents based on silver or titanium,
- **Controllable antibacterial activity** of the material,
- **Non-degradable, stable material over a long period of time** (does not create chemical compounds with atmospheric gases or molecules present in biological fluids),
- **High resistance** of the material **to photobleaching**,
- **Solubility** of used CQDs **in organic solvents** conventionally used to dissolve polymers,
- **Insolubility** of the material **in water or biological fluids** (urine, blood, sweat).

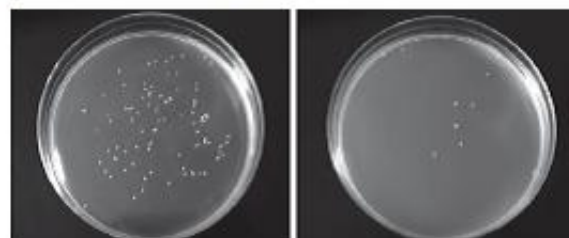
## INDUSTRIAL APPLICABILITY

- Flooring, roofing, wall covering, window covering (e.g. in hospitals), coated fabrics, flexible films for food packages, foils and sheets for antibacterial catheters, fibers for antibacterial sutures on body surface and other applications where antibacterial activity is needed, mainly in medical applications and in industries such as food production and pharmaceutical production.

**THE INVENTORS ARE LOOKING FOR AN INDUSTRIAL PARTNER FOR LICENSING THE TECHNOLOGY.**

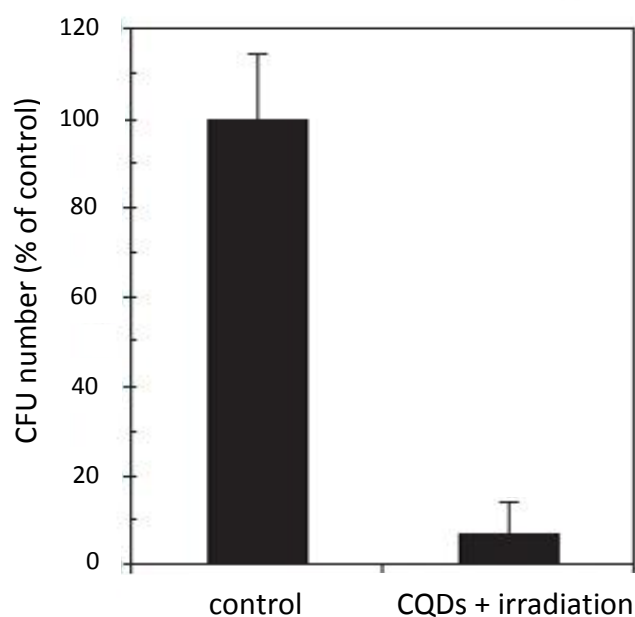
## ANTIBACTERIAL EFFECT OF CQDs

### *S. aureus*



control

CQDs + irradiation



## STAGE OF PROTECTION AND DEVELOPMENT

- Granted European patent (EP 3589682),
- Granted Slovak patent (P 288876),
- TRL 6 → system/subsystem model or prototype demonstration in a relevant environment.

## FOR MORE INFORMATION PLEASE CONTACT

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*The inventors use services of the Technology Transfer Office of Slovak Academy of Sciences to market their invention.*