

Fluorescent probe for bladder cancer detection

About technology

Bladder cancer is one of the ten most common cancers worldwide, afflicting both genders and being the 13th most common cause of death associated with cancer. A mixture of immunotherapy, chemotherapies, and surgery are currently used in its treatment. The management of early-stage bladder cancer contributes to a significant healthcare burden due to the high risk of recurrence, frequent monitoring of the disease, and high treatment costs.

Fluorescent probe described herein can be used as an effective diagnostic test for bladder cancer. It relies on synthesized internally quenched fluorescent substrate of the 20S proteasome. This peptide, 2-aminobenzoic acid (ABZ)-Val-Val-Ser-Tyr-Ala-Met-Gly-Tyr(3-NO₂)-NH₂, is cleaved by the chymotrypsin 20S proteasome subunit and displays an excellent specificity and **sensitivity and detection** limit of **32pM** and **5pM** respectively. These values clearly indicate that probe is hydrolyzed by proteasome with very high efficiency, at enzyme concentrations as low as 32 pM.

Consequently, the entire procedure of proteasome detection is very simple (involves mixing of 2 solutions), requires very small amount of biological sample (i.e. urine) and can be accomplished very quickly (within **60 minutes**). Positive result, signified by increase in fluorescence, marks proteasome 20S presence in urine, which gives the opportunity to **confirm the presence of cancer in short time**.



Research Team

UG Chemistry Department

prof. Adam Lesner
PhD Magdalena Wysocka
PhD Natalia Gruba
PhD Dawid Dębowski

IP Protection

The invention is the subject of patent protection:

- Pat.225341, UPRP

Implementation progress

TRL 4 –Technology validated in laboratory conditions

Cooperation opportunities

- Licensing agreement
- Transfer of ownership
- Spin off

