Anti-PSMA antibodies for therapeutic and diagnostic purposes

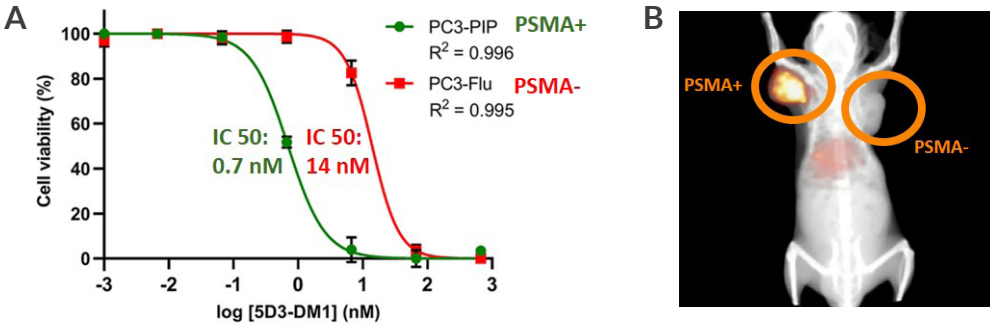
Reference No: B80048

CHALLENGE

Prostate cancer has the highest incidence and the second highest mortality among men in industrial countries. To improve prognosis a combination of precise diagnosis of tumor stage and specifically designed treatment plans is required. Prostate-specific membrane antigen (PSMA) is highly expressed on prostate cancer cells. Its specific presence in primary, high-grade and androgen-independent prostate cancer tumors as well as in metastases predetermines PSMA as a prime tool for prostate cancer imaging and therapy. So far, three PSMA-targeted small molecules have been approved for imaging purposes and the first PSMA-targeted radioligand-therapy gained approval by the FDA and EMA in 2022. Although progress has been made in the past years, there is a continuous high need for new prostate-cancer-specific applications, such as antibody-based therapies and diagnostics.

INNOVATION

Our humanized **anti-PSMA antibody 5D3** recognizes native human PSMA and is derived from the parent murine anti-PSMA antibody reported previously[1]. The therapeutic and imaging potential of 5D3 has been demonstrated in vitro and in vivo. It retains its superior properties, such as **sub-nanomolar affinity** and **high specificity** for native PSMA as well as **good thermal stability**. In addition, it has **low immunogenicity** as the murine antibody constant regions and V framework are replaced by human sequences. Anticipated liabilities were removed to facilitate various applications. Its excellent binding properties make 5D3 a superior candidate for conjugation to a therapeutic or an imaging agent.



A: In vitro cytotoxicity of an antibody-drug-conjugate (ADC)[2]. The 5D3-based ADC was cytotoxic for PSMA+ cells at 20 times lower concentrations than for PSMA- cells proving the targeting potential of 5D3. **B: In vivo imaging with 111In-DOTA-5D3**[3]

COMMERCIAL OPPORTUNITIES

The humanized anti-PSMA antibody 5D3 is suitable for **prostate cancer therapy or imaging** after conjugation with a therapeutic payload (a drug for ADC, radioligand for radiotherapy, photosensitizer for photodynamic therapy, etc.) or an imaging agent. “Sister” antibodies 1A11 and 3F11[1] are available for use in an immunohistochemistry companion diagnostic kit.

DEVELOPMENT STATUS

Optimized for developability, binding affinity and conformational stability *in vitro*

REFERENCES:

1. Novakova et al., The Prostate, 2017, 77(7):749-764
2. Huang et al., Mol Pharm. 2020 Sep 8; 17 (9): 3392-3402
3. Banerjee et al., J Nucl Med, 2019, 60(3):400-406

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