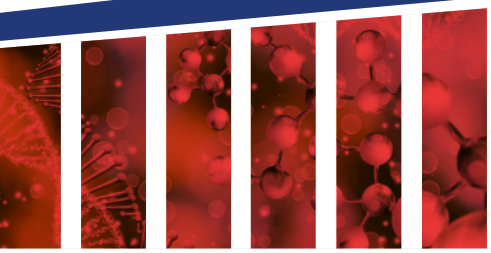

CD321-BASED METHODOLOGIES FOR ENHANCED DETECTION, QUANTIFICATION AND ISOLATION OF TUMOR CELLS AND CIRCULATING TUMOR CELLS

KEYWORDS

- Cancer diagnosis
- Circulating tumor cells
- Tumor markers

Collaboration type
License agreement
R&D collaboration

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THE TECHNOLOGY IN A NUTSHELL

The technology uses CD321 as a universal marker for more accurate detection and isolation of tumor cells and CTCs, overcoming limitations of traditional markers affected by EMT.

STATE OF THE ART

Current tumor cell detection methods predominantly rely on markers like EpCAM and Keratins. These methods are effective for certain cell types but can miss tumor cells due to marker variability or loss during epithelial-mesenchymal transition (EMT). Additionally, existing cell sorting techniques and imaging methods face challenges with sensitivity and specificity, particularly in detecting low-abundance circulating tumor cells (CTCs) and in accurately capturing cells with altered marker expression. Despite recent advances in alternative markers and imaging technologies, these methods still struggle with reliability and comprehensive detection.

THE INVENTION

The invention introduces a novel method for detecting, quantifying, and isolating tumor cells and circulating tumor cells (CTCs) using CD321 as a marker. Unlike traditional markers such as EpCAM and Keratins, which are limited by variability and loss during epithelial-mesenchymal transition, CD321 is widely and consistently expressed across various tumor types. This makes it a more reliable and sensitive marker for identifying tumor cells in biological samples. The invention enhances detection accuracy, improves the ability to isolate CTCs, and offers better tools for diagnosing, monitoring, and treating neoplastic diseases.

KEY ADVANTAGES OF THE TECHNOLOGY

- **Universal Marker:** CD321 is consistently expressed across various tumor types, overcoming limitations of conventional markers.
- **Enhanced Accuracy:** Improves detection and quantification of tumor cells and CTCs.
- **Sensitive Detection:** Remains reliable even during epithelial-mesenchymal transition (EMT).
- **Improved Isolation:** Facilitates more effective isolation of tumor cells and CTCs from biological samples.

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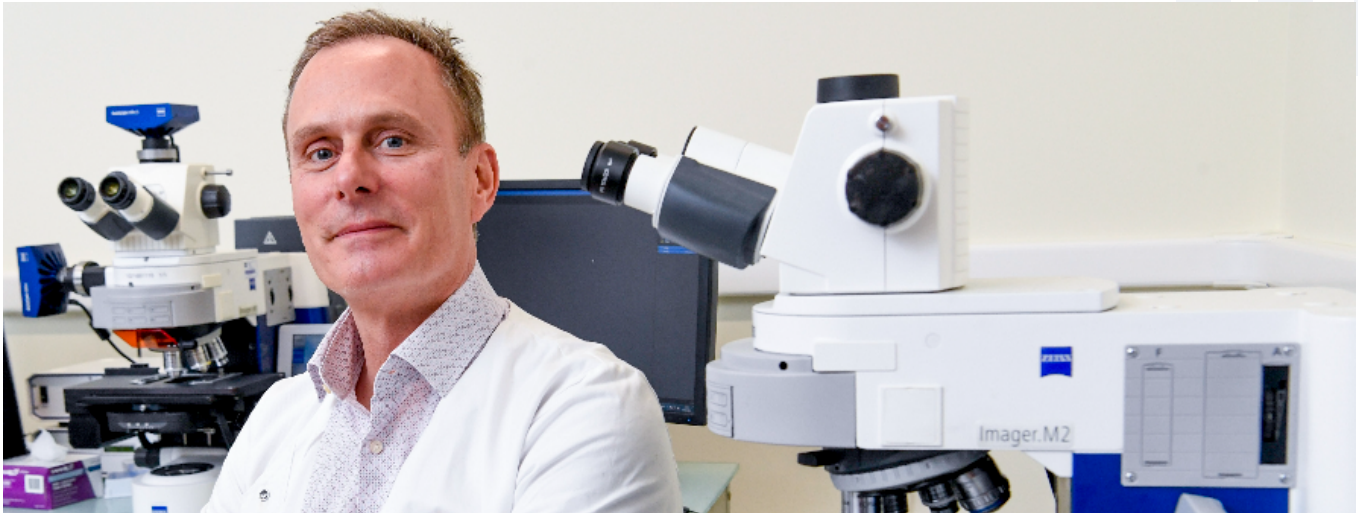
TECHNOLOGY READINESS LEVEL

1 2 **3** 4 5 6 7 8 9

TRL-3 Proof of concept of the technology on a preclinical model.

POTENTIAL APPLICATIONS

- **Cancer Diagnosis**: Accurate identification of tumor cells and CTCs for early and precise diagnosis of cancer.
- **Disease Monitoring**: Reliable monitoring of disease progression and response to treatment by tracking tumor cells and CTCs.
- **Prognosis Assessment**: Improved prognosis evaluation by quantifying and analyzing the presence of CTCs.
- **Treatment Efficacy**: Assessing the effectiveness of anti-cancer therapies by measuring changes in tumor cell and CTC levels.
- **Metastasis Detection**: Identifying metastatic potential by detecting and quantifying CTCs in patients.



THE LABORATORY

Funded in 2006 by **Prof. Cédric Blanpain**, the **Laboratory of Stem Cells & Cancer** of the **Université libre de Bruxelles (ULB)** uses lineage-tracing approaches to study the role of SCs during development, homeostasis and cancer. They uncovered the existence of stem cells and progenitors acting during homeostasis and repair of the epidermis and uncovered a novel paradigm of lineage segregation in the mammary gland and prostate. The lab was pioneered in using mouse genetics to identify the cancer cell of origin of epithelial cancers. They identified the cancer cell of origin and the mechanisms regulating the early steps of tumor initiation in skin basal cell carcinoma, skin squamous cell carcinoma and mammary tumors. They developed novel approaches to unravel the mode of tumor growth within their natural environment and to understand the mechanisms regulating cancer stem cell functions.

RELEVANT PUBLICATIONS

> Ievgenia Pastushenko, Panagiota Sotiropoulou, Cédric Blanpain. **Identification of the tumor transition states occurring during EMT and their implications for metastasis [abstract]**. In: **Proceedings of the American Association for Cancer Research Annual Meeting 2017**; 2017 Apr 1-5; Washington, DC. Philadelphia (PA): AACR; Cancer Res 2017;77(13 Suppl):Abstract nr LB-146. doi:10.1158/1538-7445.AM2017-LB-146

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