

CRT Licensing Opportunity



MUC1 Naked DNA Vaccine

- MUC1 has been clinically validated as an exciting target for cancer vaccines
- Granted patents protecting MUC1 DNA based immunotherapy
- Well characterised MUC1 transgenic mouse model allows rapid and accurate pre-clinical evaluation

BIOLOGICAL THERAPEUTICS | *In Vivo* Proof-of-Principle

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Lead Inventors

Professor Joyce Taylor-Papadimitriou & Dr Joy Burchell (Cancer Research UK Breast Cancer Biology Group, Guy's Hospital, London).

Application

Mucin 1 (MUC1 or Polymorphic Epithelial Mucin, PEM) is a high MW glycoprotein expressed on the cell surface of epithelial cells. The increased expression and/or aberrant glycosylation of MUC-1 is associated with a variety of adenocarcinomas including those of breast, ovary, lung, liver, colorectal and pancreas. As a result, MUC1 has attracted considerable interest as a potential tumour antigen for development of anti-cancer vaccines. Indeed, clinical trial results (presented at ASCO 2005) have shown that vaccination with MUC1 peptide or virally delivered MUC1 DNA induces effective anti-tumour responses and extends survival time in selected groups of patients.

Non-viral DNA based vaccines have great potential for treatment of cancer in both prophylactic and therapeutic settings. The ease of manufacture allied with a usually excellent toxicity profile makes DNA based vaccines clinically and commercially attractive approach for cancer vaccination.

CRT is seeking licensees for a package of patents, materials and know-how for development of non-viral DNA based vaccination against the MUC1 tumour antigen.

The commercial package available for licensing includes:

- Exclusive license to CRT's MUC1 DNA related patent portfolio in the field of non-viral DNA immunotherapy
- Non-exclusive license to CRT's MUC1 transgenic mouse model
- Murine cell lines expressing human MUC1 and parental control cell lines for tumour challenge experiments.

Technology

Translation of preclinical proof of efficacy results into clinical responses has been hitherto a challenging obstacle in development of therapeutic cancer vaccines. As such, availability of a suitable animal model is imperative for preclinical validation and optimisation of tumour antigen based cancer vaccines. Induced immune reaction to human antigens in preclinical models is only physiologically meaningful if, as is the case with cancer patients, the animals are immunologically tolerant to the human antigen. The MUC1 transgenic mouse model, developed by Prof. Joyce Taylor-Papadimitriou's laboratory (1), expresses the human MUC1 transgene and retains the human tissue expression pattern. As in humans, the MUC1 transgenic mice are immunologically tolerant to human MUC1. This mouse model along with murine cell lines expressing human MUC1 have been the basis of a number of studies investigating and developing the potential of MUC1 as a tumour antigen (1, 2).

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Clinical validation of MUC1 as a promising target in combination with patents protecting MUC1 antigen plus availability of MUC1 transgenic mice makes this an attractive package for development of MUC1 DNA cancer vaccine.

Intellectual Property

MUC1

CRT owns granted patents protecting DNA based MUC1 immunotherapy in US (US6054438; due to expire in 2017), Canada (CA1339204; due to expire in 2014).

Commercial Opportunity

CRT is seeking a commercial partner for further development of MUC1 DNA based immunotherapy under exclusive license to CRT's MUC1 patents and MUC1 mouse model.

References

- 1 Carr-Brendel *et al.* 2000 Cancer Res. 60:2435-43
- 2 Heukamp *et al.* 2002 J Immunother. 25:46-56

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