GluCAB™

– improved cancer treatment through two-stage direct targeting

What are radiopharmaceuticals?

Radiopharmaceuticals are popularly used as tracers in medical imaging and therapy for many types of cancer. In recent years, however, radiopharmaceutical cancer research started to focus on imaging and radiotherapeutic methods which directly target tumours with minimal side effects or damage to healthy cells.

The Necsa technology

GluCAB™, a new two-stage direct targeting radiopharmaceutical compound currently being developed by the South African Nuclear Energy Corporation SOC Ltd (Necsa), is set to significantly increase the market share of therapeutic radiopharmaceuticals.

The need and gap

The global radiopharmaceutical market continues to grow at a steady pace, and is expected to increase from around US$4 billion to reach US$6 billion in annual sales by 2017 (Research and Markets Report). Therapeutic radiopharmaceuticals capture only 10% of the current market, leaving considerable opportunity for growth.

The Necsa value proposition

The numerous advantages of GluCAB™ over conventional cancer diagnostics and therapeutic procedures will include improved bio-distribution that will significantly lower pharmacological toxicity and side effects. This will not only have an impact on individual cancer patients and their families, but promise to become a socio-economic driver in healthcare systems around the globe.

Benefits of GluCAB™

- Improves bio-distribution, which will significantly reduce pharmacological toxicity. There will therefore be fewer side effects and less damage to healthy cells
- Improves diagnosis and treatment of cancer
- Reduces healthcare costs for patients
- Reduces patient recovery time and increases survival rates
- Growing demand for radiopharmaceutical therapeutic products such as GluCAB™

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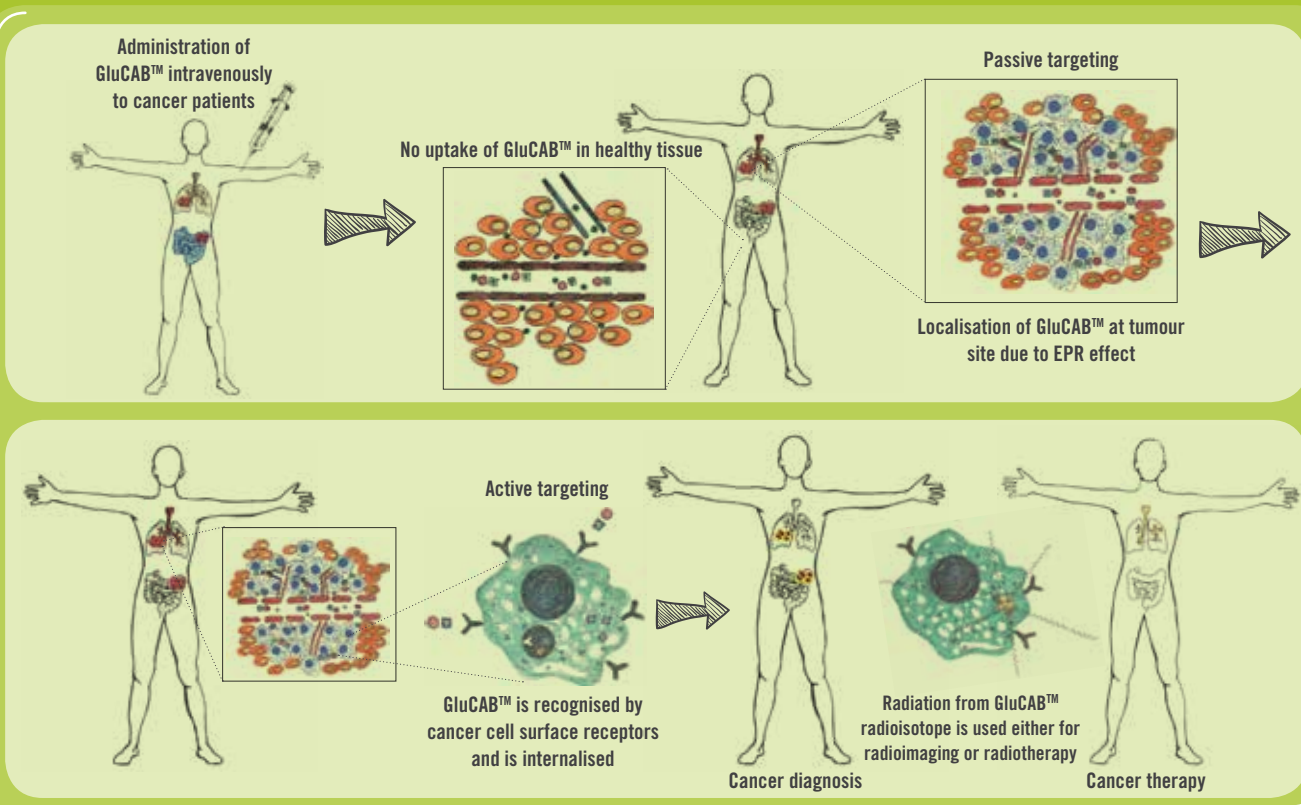
Two-stage direct targeting process (proposed mechanism of action)

STAGE 1:

The GluCAB™ compound localises in the regions of the tumour through its passive targeting sub-system via the enhanced permeability and retention (EPR) effect.



STAGE 2:

Once at the targeted area, the compound uses its active targeting sub-system to attach itself to a specific receptor on the surface of the cancer cell and delivers a radioisotope into the tumour cell. The delivered radioisotope tracer makes it possible to image and diagnose cancer through CT scanning. The tracer can also be used as a therapeutic treatment to destroy the cancer cells.

Theranostics, when an agent used for diagnosis (to determine the uptake of the radiopharmaceutical) via imaging or therapy, depending on the radioisotope used, is fast becoming the norm in personalised medicine. The GluCAB™ radiopharmaceutical agent described here is an example of this.

Technology readiness level (TRL) and intellectual property protection

- TRL Level 4 – Laboratory Testing/Validation of Component(s)/Process(es)
- UK application 1417067.4 filed with assignees Necsa (50%) and UCT (50%)

Become a partner in this technology

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About Necsa

Nuclear technology plays a fundamental role in day-to-day life. Applications such as medical isotopes, used in cancer treatment, and fluorochemicals, used in petroleum manufacturing and in items such as LCD screens and cellphones, enhance more than 10 million lives every year.

Necsa is at the forefront of nuclear energy and radiation science research and development (R&D) on the African continent. NTP Radioisotopes SOC Ltd, a Necsa subsidiary, is one of the top three producers of nuclear medicine in the world, while Pelchem SOC Ltd, another Necsa subsidiary, is the only fluorochemical production, sales and distribution company in the southern hemisphere.

The Radiochemistry Group at Necsa performs research and development in all fields of radiochemistry and radiopharmaceuticals. This includes, amongst others, the labelling of new identified pharmaceutical compounds for preclinical or clinical studies to determine the *in vivo* biodistribution and the development of new radiopharmaceutical agents for diagnostic imaging or the therapeutic treatment of malignant tumours.

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