CHIMERIC COMPLEX AND ITS THERAPEUTIC APPLICATIONS IN CANCER AND METASTASIS TREATMENT

TECHNOLOGY READINESS LEVEL (TRL): 4

UNIVERSITÀ DEGLI STUDI DI TORINO

Team Delegate Daniela Taverna
Patent number 102019000015806
License INTERNATIONAL

CHALLENGE

Cancer usually leads to patient death because cells can detach from primary tumors and form metastases in distant organs, which are responsible for about 90% of deaths. In 2018, 18.1 million cancer cases were diagnosed around the world and 9.5 million people died because of cancer. It has also been anticipated that by 2040, the number of new cases will rise to 29.5 million with the consequent death of 16.4 million patients. Therefore, it is important to develop new therapies in order to block or control tumour progression. Chemotherapy and radiotherapy are not always sufficient to block tumour spread and they also result very toxic for the patients. So, it is necessary to develop targeted therapy to specifically hit cancer cells, thus reducing the side-effects.

TECHNOLOGY

The molecule object of the present invention is a chimeric complex, in other words a macromolecular complex which comprises molecules of different nature and characterized by different actions. In particular, this chimeric complex is composed of an aptamer which targets a specific tyrosine kinase receptor (AXL) and a microRNA, called miR-148b, characterized by an anti-metastatic activity. The aptamer is able to bind specifically to the AXL receptor, known to be expressed on the surface of many cancer cells. By doing so, miR-148b is specifically conveyed to cancer cells, where it exerts its anti-metastatic activity. The chimeric complex, indicated as axl-148b, does not target non-tumour cells, that do not express the AXL receptor. Therefore, this chimeric complex is proposed as a therapeutic treatment for malignant solid tumours with are able to form metastases. We already know that axl-148b functions well in vitro and in vivo on breast cancer and melanoma cells and in vitro on lung cancer cells, a big killer among all the malignancies. Since both axl and miR-148b levels are also altered in other kinds of tumour, axl-148b chimeric aptamer may be used to inhibit metastasization also in other neoplasia. Furthermore, axl-148b may be combined with other therapies such as monoclonal antibodies, immunotherapy, hormonal therapy and chemotherapy.

DEVELOPMENT STATUS

Stabilized compound is available, and valued as a competitive market alternative for cancer therapy. Currently, we are characterizing the molecule to conclude pre-clinical studies and developing another structure of axl-148b with the goal of obtaining a highly stable molecule that will allow us to administer axl-148b to patients with a reduced number of administrations. Pre-clinical studies will be conducted in order to assess the toxicity, pharmacokinetics, pharmacodynamics and biodistribution of axl-148b in mice and other animal models.

COMMERCIAL OPPORTUNITY

Seeking pharmaceutical companies working to collaborate and push development to clinical trials.

Contact the team via Knowledge Share