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Mini Review

# Innovation and Technology: For the Treatment of Cancer

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## Abstract

The evaluation of new technologies continuously and quickly adopts those that can improve their ability to select the right compounds for future projects or that can be used to create new and better diagnostic tests.

New technologies and research areas are the basis of current and future medicine. Some of them have emerged only recently.

**Keywords:** Innovation; Technology; Cancer

### RNA-based therapies

Through the alliance with Alnylam, access to new classes of therapies based on ribonucleic acid (RNA) was recently acquired. With the global investment in the Center of Excellence in RNA Therapies in Kulmbach, Germany.

A currently is aimed at the discovery and development of therapies that use the principle of RNA interference (RNAi) for the treatment of oncological, respiratory and metabolic diseases. Many diseases are the result of the expression of undesirable genes (viral infections), mutants or overexpression of genes (many oncological diseases).

Through the iRNA domain, the white genes can be silenced before the production of the corresponding harmful proteins. In principle, by using RNAi it is possible to silence any gene in the genome, including target genes that are still "not treatable with drugs". IRNA technology allows the identification of the disease in a much shorter time than with existing technologies.

Collaboration with Noxxon regarding Spiegelmers. Spiegelmers are unnatural (D-RNA), biologically stable and non-immunogenic molecules that bind with great affinity and specificity to an extracellular target, much like antibodies. Other therapeutic approaches based on RNA are also being studied.

### Innovation and Technology

### Biological markers - Key to Personalized Medicine

Biomarkers are objective indicators that are used to evaluate the normal biological processes of the disease or analyze the response to a drug or treatment. In the process of R and D of a drug, many different biomarkers are used for various purposes.

The different types and applications of biomarkers cover a broad spectrum of the health area:

- The biomarkers for risk assessment allow to calculate the risk of an individual to develop a certain disease.
- Biomarkers for a precocious and specific indication of the toxicity of a compound.
- Prognostic biomarkers, which provide information about the probable course of the disease.
- The biomarkers for stratification according to the probable response to the drug allow physicians to determine the best option for the treatment of a patient.
- Biomarkers for therapy monitoring provide information at an early stage, and this allows to evaluate if the treatment is working or if the disease is reoccurring.

Examples: Blood pressure is a marker of hypertension.

(Trastuzumab), for example, was developed as an effective treatment for patients with breast cancer whose tumor is positive for HER2, a specific molecular trait.

In the case of patients with HIV, monitoring the viral load, that is, the amount of virus in the blood, is an effective biomarker. It is accepted by health authorities as an important parameter in clinical trials of new drugs, such as (Enfuvirtide), which fights HIV before entering healthy cells. The combination of an effective drug with a good biomarker is especially important for patients with limited therapeutic options.

The markers can be discovered, developed and validated through various innovative and promising technologies, ranging from genomics and proteomics to imaging techniques. These tools are used widely and consistently in all divisions and for various functions.

Part of the strategy is its systematic approach to Personalized Medicine, a field in which biomarkers are essential. The most cited example of Personalized Medicine is the use of (Trastuzumab) and its combined diagnostic test to identify the HER2 biomarker.

The same name, different diseases.

Simultaneously, great leaps were made in the field of molecular biology and genome sequencing. These findings represented great progress in understanding the molecular processes and alterations that lead to the growth and spread of neoplasms.

In the area of lung cancer, the researchers quickly understood that they were facing a multitude of diseases covered by the same umbrella. It was possible to know precisely the cellular mutations that, although they were expressed by tumors in the same place (the lungs), had their origin in different genetic alterations. So far, at least 12 different types of lung cancer have been identified.

This knowledge gave scientists the possibility of identifying new targets to which to point the medication. They focused on epidermal growth factor receptor (EGFR), anaplastic lymphoma kinase (ALK), or Kirsten rat sarcoma (KRAS) genes, among others, to improve outcomes in patients with lung cancer.

Thus, the previous approach that proposed "the same solution that fits all" began to be left behind, to give rise to personalized medicine. If the tumor of a patient is due to a certain genetic alteration, the treatment does not necessarily have to be the same as that of the patient who has another genetic alteration, although the result of both alterations is lung cancer.

In clinical practice, genetic tests are key, as they allow doctors to better understand and identify those patients who could benefit most from certain treatments. In addition, they provide more in-depth information about the prognosis of patients. The beginning of the "genomic era" led to the discovery of several mutations in lung cancer, which in recent years were used to predict who are more likely to respond to certain treatments.

Another great leap forward in cancer care was the discovery of how the immune system can stop the growth and spread of cancer cells, at least in their early stages, since then the tumor cells learn to hide from the immune system. These investigations allowed the creation of immunotherapies for cancer, which take advantage of the innate power of the immune system to fight against tumor diseases.

In oncology, the mission is to develop medicines that save lives, and diagnostic tests that allow doctors to choose the most effective treatment regimen for each patient with lung cancer. We are committed to advancing molecular biology and genomic sequencing to shore up the next generation of cancer drugs [1-5].

## Conclusion

Technological advances are of paramount importance to patients; but it is the medical criterion who must discern when and how to apply it. With all the possible evidence.

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