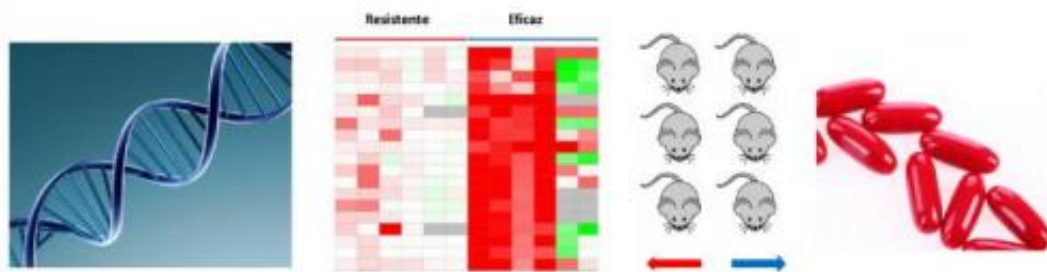


Team presents a new strategy to personalise cancer therapies

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This shows personalized therapies in advanced cancer patients according to tumor genetic analysis and avatar mice. Credit: Elena Garralda (CNIO)

Tumour cells can accumulate hundreds or even thousands of DNA mutations which induce the growth and spread of cancer. The number and pattern of mutations differs according to the type of tumour, even among those that are classified as part of the same type of tumours. This complexity, which researchers were not aware of just a few years ago, calls for new tools to filter relevant genetic information for the implementation and development of personalised therapies targeted at specific characteristics within each individual tumour.

Researchers led by Manuel Hidalgo, Vice-Director of Translational Research at CNIO, have developed a new strategy to personalised medicine in advanced [cancer patients](#) with a poor prognosis. The study has been published in the journal *Clinical Cancer Research*. Applying this

new tool, the treatments induced clinical responses in up to 77% of patients, either through the stabilisation of their condition or through a partial clinical response.

During the first phase, the authors analysed the genetic signature of the tumours –specifically, the hundreds of millions of letters that make up the exome; the part of the genome whose information produces proteins– in 23 patients suffering from advanced cancers, such as pancreatic adenocarcinomas and [colon cancer](#). By using whole exome sequencing and bioinformatics analyses, researchers picked out mutations that could play an important role in the growth and spread of tumours.

The second part of the study involved the use of Avatar mice to study potentially effective treatments according to the patient's genetic signature. As Elena Garralda, predoctoral researcher from Hidalgo's Group, points out, avatar mice are "one of the key aspects of our research."

Avatar mice: a testing ground for drugs

Avatar mice are used as a testing ground, with each patient having their own equivalent animal, in order to study the effectiveness of drugs under real conditions: if the drug works in the avatar, the likelihood of it also working in the patient is very high.

Therefore, the treatments that worked best in the avatar mice were the ones given to patients. The results showed clinical benefit, either the stabilisation of the disease or a partial clinical response, in up to 77% of patients.

"We have demonstrated that it is possible to apply our personalised cancer treatment strategy to the clinic", says Garralda, adding: "as we

learn more about the genetic information obtained from cancer exome sequencing, future clinical trials will allow for the inclusion of patients with specific genetic alterations, and therefore a better access to cancer drugs."

Future assays on pancreatic cancer

Currently, one the main objectives for the team is to study the efficiency of the procedures in a larger number of patients with advanced [pancreatic cancer](#), thereby comparing them to standard treatments.

Pancreatic cancer often has a [poor prognosis](#), with survival rates of less than 1 year. It is a complex and heterogeneous disease, meaning that the personalised study of the most relevant mutations in tumour growth (driver mutations) could be a promising strategy in the search for new treatments.

More information: Integrated Next Generation Sequencing and Avatar Mouse Models for Personalized Cancer Treatment. Garralda E, Paz K, López-Casas PP, Jones S, Katz A, Kann LM, López-Ríos F, Sarno F, Al-Shahrour F, Vasquez D, Bruckheimer E, Angiuoli SV, Calles A, Diaz LA, Velculescu VE, Valencia A, Sidransky D, Hidalgo M. *Clinical Cancer Research* (2014). [DOI: 10.1158/1078-0432.CCR-13-3047](#)

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