# INDRA CREATES A SMART PROTOTYPE TO HELP PERSONALIZE ONCOLOGY TREATMENTS

- **TradionP has been created as a support tool for medical decisions thanks to its ability to add different types of information about individual patients and to recognize common patterns**

- **The project, carried out in a consortium with Althia and Lorgen, has created a retrospective database of nearly 1,000 patients in Granada with lung, breast and colorectal cancer**

- **The consortium, which is led by Indra and includes ERA7 and Máster Diagnóstica, is currently working on OncoExpert, an evolution of TradionP that includes hospitals of the Andalusia Health Service (SAS in Spanish) from other provinces and more advanced techniques for detecting molecular alterations**

The creation of a new, comprehensive oncology patient management standard to guide multimode therapy (surgery, radiotherapy and chemotherapy) in a personalized and effective manner is now a reality thanks to TradionP. This R&D&i project, developed by Indra in a consortium with Althia and Lorgen, has resulted in the design of an expert system prototype that, through artificial intelligence techniques, allows modeling oncology diseases and selecting specific therapies for each patient.

The pilot was funded by the CDTI and the European Union's Technology Fund (FEDER), and it has been carried out with the collaboration of Virgen de las Nieves Hospital and Sancecilio Clinical Hospital, both in Granada. It has also involved a number of public organizations such as the Granada Cancer Registry, the Andalusia Tumor Bank, and the GENYO Genome Center.

The system feeds from a retrospective database that is open to new data and has been created as part of the project with restricted access through the use of passwords given to health system professionals. It houses information about nearly 1,000 patients with breast, lunch and colorectal cancer (half treated with biological therapies and the other half with chemotherapy) that integrates clinical and morphological parameters, family history, radiology images, biomarkers and genetic sequences. It also includes applications for presenting, conveying and extracting information (individualized phenotypes and tumor modeling) using the database, as well as algorithms for designing individualized treatments by integrating different types of data. The database currently contains nearly 700,000 markers to be analyzed, including more than 15,000 clinical and image data elements, approximately 400,000 of methylation (inactive "good" genes) and more than 200,000 of genotypes.
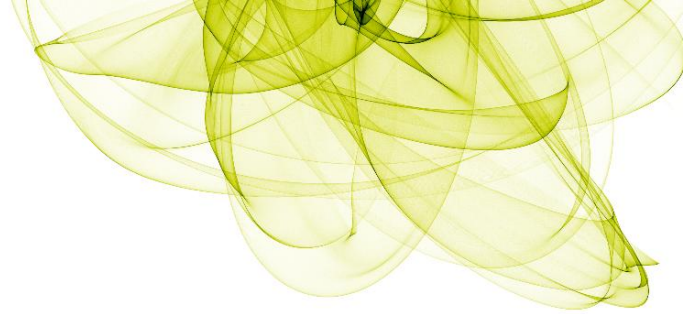
The main innovation of TradionP is its ability to add different types of information about individual patients and to recognize common patterns in order to offer a more precise and effective response prediction and tumor evolution. In other words, doctors are able to study new patients in a more structured manner thanks to the possibility of combining the information they gather with global information on what has been done with similar patients and what the expert system offers. As a result, a patient with breast or colorectal cancer will be similar to one of the patterns that have been studied in the project, and so if a small group of variables are collected from the patient, the doctor can choose the best therapy or predict the patient's evolution. In summary, the system allows concluding whether a therapy is more or less effective, and how that effectiveness is correlated to the molecular data of the patient and the tumor.

Less exposure to aggressive treatments

Its main objective is to become a tool that helps oncologists establish a diagnosis that is more precise and treatment for the illness that is more appropriate. This will also have a positive effect on the lives of patients since it will be possible to reduce their exposure to aggressive treatments that are not effective for certain types of patients and to avoid the risk of side effects.

TradionP also allows professionals to ask questions regarding patient survival or a tumor's recurrence by entering clinical data that the expert system will process according to selected variables. As a result, it can create graphs with estimated survival or recurrence probabilities as certain time periods are surpassed. It also includes data mining technologies that help establish patterns by combining the information collected in the database (e.g., mortality of patients who received palliative biological therapy with an advanced condition at the time of diagnosis).

Other benefits include rationing healthcare expenses to avoid unnecessary therapies, or creating an integrated oncology history of patients for doctors and healthcare professionals. It will be available in a cloud format with all the benefits of Cloud Computing models, allowing any registered professional to receive the survival and recurrence probabilities for a patient at any location by providing the data requested by the system, and with all the security measures offered by Indra's cloud.

A constantly evolving system

The new consortium led by Indra is currently working on OncoExpert, an evolution of TradionP that includes five new hospitals of the Andalusia Health Service (Juan Ramón Jiménez, in Huelva; Virgen del Rocío, in Seville; Reina Sofía, in Córdoba, Virgen de la Victoria, in Málaga and Ciudad de Jaén) as well as 200 breast and colorectal cancer cases. The aim is to extend the study to other geographic areas in Andalusia with the goal of including the peculiarities that these pathologies may present in different regions so as to validate the system as a whole.

It also includes new, more advanced techniques for detecting molecular alterations, such as the complete exome analysis (an analysis of all the genes that are transcribed to proteins), the study of new tumor markers and detecting the presence of the tumor's stem cells as indicators of the cancer's evolution.
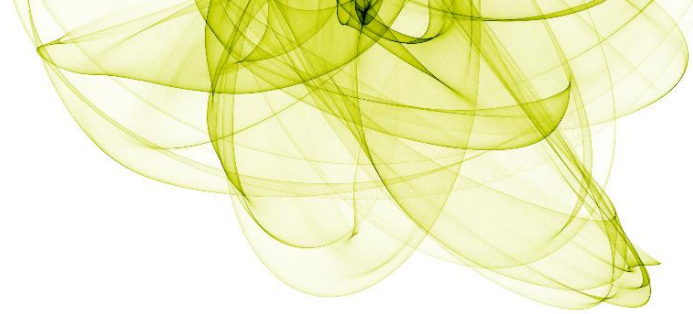
Indra

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