

Cancer research as a network challenge

IFOM 2020: the future directions for cancer research were set down in a public event held this morning at the Milanese institute founded by FIRC. The discussions, which were based on IFOM's experience over the past 10 years, were held between national and international, scientific and institutional partners. Their conclusions? The future and excellence of Italian research depends on its ability to overcome geographical, institutional and professional barriers, in order to promote synergy, interdisciplinarity and transnationality in research.

In the late 90s, the Italian Foundation for Cancer Research (FIRC), with remarkable foresight, came to the realization that the Italian cancer research scene lacked a fundamental element: a centre dedicated entirely to cancer research that focuses primarily on the study of the molecular mechanisms underlying the formation and development of cancer.

This vision of FIRC soon became reality with the creation of IFOM, the FIRC Institute of Molecular Oncology, which was the first – and remains the only - Italian research centre specialized in this scientific field.

The creation of IFOM was a bold choice considering that the results of basic research, by their very nature, are only the starting point. They provide the foundations for a long process that may, one day, produce solutions for the diagnosis and treatment of cancer.

"This was a very difficult decision to make, particularly as we are a charity," explains Piero Sierra, President of FIRC, in his welcoming talk at the public event held this morning. "We have always felt the responsibility of providing answers, solutions and knowledge to our donors, to society and to public institutions. We took the decision, however, because we firmly believe that acquiring knowledge is a necessary prerequisite for curing cancer."

Today, 10 years after the launch of IFOM's scientific program, FIRC's intuition was proven right. IFOM has currently 19 research programs investigating the most promising frontiers in cancer research, and publishes over 100 articles a year in the most prestigious, international scientific journals, such as Science, Nature and Cell. In the words of Tomas Lindahl, Director Emeritus of Clare Hall Laboratories, Cancer Research UK: "IFOM has already gained national recognition as a model for the development of new research strategies, based on advanced and specialized research laboratories. At international level, IFOM is now an established leader in the field of molecular oncology."

The Milan branch of IFOM, which was built on an ex-industrial site of 11,000 square meters, is a truly international hub: 25% of its 200 researchers are foreigners, coming from 25 different countries, some of which are the most competitive areas in the world for cancer research: Japan, Great Britain, USA, Malaysia, Germany and Canada. IFOM's Italian researchers, on the other hand, come from 17 (of 20) different regions in Italy. Many of these researchers, after completing their time at IFOM, go on to conduct research at some of the most prestigious, international, research institutions, where they gain skills and knowledge, which can be brought back to Italy. IFOM thus attracts international 'brains' and promotes the circulation of national 'brains', in net contrast with the much-discussed "brain drain" from Italy.

However, the goal of IFOM and FIRC at today's' public meeting, *IFOM 2020 - Cancer research of tomorrow: Synergic, Interdisciplinary, Transnational*, chaired by Carmen Lasorella and held in IFOM's lecture theatre, was not to pat themselves on the back for their successful vision, nor was it to celebrate the success of IFOM's first 10 years. Rather they wished to define the way forward for cancer research, one that will permit the Italian research system to become increasingly competitive at the international level, in terms scientific research and technological innovation.

Rather than blowing out the candles for its 10th anniversary, IFOM has ignited a challenge that it extends to other players in the Italian research system and in the international scientific community. "At the time of its foundation, in the post-genomic era, IFOM was faced with technological challenges," comments Marco Foiani, Scientific Director of IFOM since January 2009 and Head of one of the first research programs to be activated in 2000. "Now, we face an intellectual challenge." Based on this perspective, Foiani is now developing IFOM's directives, which were laid down by his predecessor, Pier Paolo Di Fiore.

The future directions proposed by the research institute are set out in the conference title and were discussed, in terms of their scientific and socio-economic implications, and their implementation, by Foiani. "The goals of cancer research are now very clear: to achieve the earliest diagnosis possible by identifying tumours with particular mutations; to identify and inactivate processes that 'keep cancer cells alive'; to develop strategies to target drugs specifically to the tumour." The keys to success in achieving these goals, according to Foiani, are synergy, interdisciplinarity and transnationality. "These are three faces of the same pyramid," says the researcher. "Synergy, from both a cultural and an economic perspective, was a founding idea in the creation of IFOM. One of its original aims was to form a network of scientists coming from the major Italian scientific institutions. This is increasingly our way of 'doing science' today: in collaboration with the best international and national scientific institutions."

"Interdisciplinarity," continues Foiani, "is the second key to success: scientific progress requires a diversity of ever-changing skills. In the future, answers will not come from isolated 'super-scientists', but rather from mixed, multidisciplinary teams that integrate technological expertise and complementary sciences to approach the problem from different perspectives."

Are there any examples of a combined synergistic and interdisciplinary approach to research? The recently established European Centre for Nanomedicine (CEN), which was represented at the conference by its president Adriano De Maio, is such an example. The CEN is a network created by IFOM along with 10 other prestigious public and private research centres that have agreed to share resources and scientific-technological expertise in the field of nanomedicine - the most promising frontier in biomedical research. The aim of the CEN is to develop innovative solutions for the prevention, diagnosis and treatment of cancer. "The real challenge in this field," states Foiani, "is the incorporation into educational programs of a common 'language' linking traditionally separate subjects, such as medicine, biology, physics, chemistry, computer science and engineering, thus forging a truly interdisciplinary state of mind."

The third key to success involves a long journey, metaphorically and geographically speaking: transnationality. "This is a familiar concept in economic and social fields," points out Foiani, "yet it is, perfectly suited to describe tomorrow's scientific community: free from geographical constraints and characterized by transnational partnerships based on common research goals, shared resources and technologies, educational exchanges, and the free movement of 'brains'."

"Only in this way," comments Piero Sierra, "can we enter into a global scientific debate, triggering a virtuous cycle that, in return, will give added value to Italy at the scientific, economic, educational and professional level."

If yesterday's challenge for scientific research was *translational*, i.e., the rapid transfer of results from laboratory to clinical practice, the conclusions of today's meeting have now pushed back the horizons, incorporating *translational* in the broader *transnational* context, as confirmed in Tomas Lindahl's talk; "For successful positive interactions, complementary personal interests and mutual respect are more important than geographical aspects. Using this networking model, IFOM is quickly establishing itself as a modern and remarkably successful international research unit."

A recent example of this is the agreement signed in 2009 between IFOM and A*STAR: the government agency for Science, Technology and Research in Singapore, a global leader in biomedical research. The agreement aims to promote research collaborations and exchanges of personnel and students. "Establishing strategic alliances with leading international institutions, such as IFOM," underlined Lee Eng Hin, Executive Director of the Biomedical Research Council of A*STAR, "is one of our key strategies for creating new scientific knowledge and for stimulating innovation within the biomedical sciences. Based on the shared goal of A*STAR and IFOM to translate research discoveries into biomedical applications that have important consequences for human health, we believe that this agreement will mark the beginning of a broader and more long-term partnership between Singapore and the Italian research community."

The agreement with A*STAR in Singapore is only the beginning of a transnational, collaborative strategy initiated by IFOM with centres of excellence in the Asian scientific community; agreements have recently been signed with the Medical School of Kyoto University in Japan and with the National Centre for Biological Sciences in Bangalore, India.

IN CHIUSURA: citazione conclusiva di UV tratta da conversazione con Carmen Lasorella