

The Italian oncology was born here



Fondazione IRCCS
Istituto Nazionale dei Tumori

Sistema Socio Sanitario



Regione
Lombardia



YESTERDAY, TODAY AND TOMORROW: INT FIRST AMONG ALL THE ITALIAN CANCER IRCCS*

Italian oncology was born at INT - *Istituto Nazionale dei Tumori di Milano* (National Cancer Institute of Milan) on 12 April 1928 and, due to the high quality of its research and therapeutic pathways, the Institute has always established itself as the leading Italian cancer center.

Thanks to the efforts of its 2,175 people – of whom over 650 are devoted to research – and to its 27 laboratories, today the Institute is a center of excellence for pre-clinical, translational, clinical-public health and organizational-management research activities. INT is a national and international reference center for both high-incidence and rare and pediatric cancers. The strong attention to technological innovation – which allows cutting-edge diagnostic and therapeutic services, capable of ensuring increasingly accurate and early diagnoses and personalized treatments – is one of the factors that helps the Institute play a prestigious role in today's healthcare landscape, by being the foremost oncology center in Lombardy and in Italy, the leading pediatric oncology center in Italy (and among the first in Europe), as well as the only Italian cancer center to be authorized for liver transplantation. Confirming its strong reputation within the national and international healthcare scene, the Institute attracts a constant flow of patients from all Italian regions, as well as from abroad, thanks to a passion for

a work that leads to the progress of science and to satisfy any legitimate healthcare expectations.

The Institute is classified as a Comprehensive Cancer Center, a recognition conferred by OEI (*Organization of European Cancer Institutes*); it is the coordinator of several European projects funded by the EU; it is a member of the *Cancer Core Europe* consortium, consisting of the seven main European Cancer Centers and OEI, a network that brings together over one hundred European cancer institutes.

Furthermore, as indicated by the World's Best Specialized Hospitals 2023, INT is in 17th place in the ranking of the best 300 Oncology Centers in the world; it ranks fourth among European hospitals; and holds the top position in Italy, where it is the first among national public hospitals.

To portray the constant dynamism of INT, it should be mentioned the project *Città della Salute e della Ricerca* ("City of Health and Research") of Sesto San Giovanni, which constitutes an important opportunity to develop a culture of excellence in healthcare and health training, as well as a big step forward towards a more advanced and accessible healthcare for everyone.

Without forgetting the urban and territorial benefit for the city, this project therefore leads to a leap in quality of research, treatment and care activities, representing an outstanding opportunity in terms of economic sustainability, scientific and technological potential, technical and scientific updating capabilities, relationship with the territory as well as with the international scientific context.

Marco Votta
President of Istituto Nazionale dei Tumori di Milano

*IRCCS = Istituti di Ricovero e Cura a Carattere Scientifico ("Institute for scientific research and care")

CARE, RESEARCH AND TRAINING AT THE BASE OF MODERN MEDICINE

The Foundation has always interpreted its role as a scientific hospitalization and care institution, whose peculiarity is the translation of research results into care, which is a tool that ensures patient the best treatment available.

Critical and indispensable principles for the Institute are the respect for the dignity of the human being and the protection of patients and their right to receive the most appropriate medical assistance and treatment, with a second opinion function for patients followed by other hospitals, or for more complex clinical situations.

Over the years, the Institute has made many advances in the fight against cancer, including the discovery of new treatments and the establishment of new standards of care, but its continued commitment to scientific research – which still helps to develop new therapies and improve the lives of patients – and its investment in innovative therapies, robotics, education and continuous training of healthcare and administrative personnel, are a guarantee of the medical and scientific excellence of the Institute, which therefore remains capable to promptly respond to present and future medicine modernization needs, for the benefit of the community. In an era of big technological challenges, INT has to deal with accelerated scientific progress, and competitiveness with the rest of the world – with particular reference to



Europe – requires strong territorial cohesion, great common goals, innovation and digital transition, characterization of skills and abilities to face the great health challenges of the coming years, aiming at the application of a modern “4P” Medicine: Personalized, Predictive, Preventive and Participatory.

The foundations for the application of this type of Medicine – capable of reducing risks, preventing or delaying the onset, evolution or progression of disease, and designing innovative and personalized lines of intervention – are based on an optimal use of the large amount of health data (big data), thanks to a powerful IT infrastructure base, on which to apply artificial intelligence technologies and tools.

The Institute has been at the forefront of the fight against cancer for 95 years and is determined to remain a leader in the research, treatment and prevention of this disease, while offering a wide range of services, from diagnosis to therapy, through research and prevention, in order to ensure a complete and personalized path for each patient.

Carlo Nicora
General Manager of Istituto Nazionale dei Tumori di Milano



CENTER OF EXCELLENCE FOR PRE-CLINICAL, TRANSLATIONAL AND CLINICAL- PUBLIC HEALTH RESEARCH

In the future, research will be more patient-oriented, less reactive and more pro-active. A research focused more on our ability to prevent and learn about cancer, the patient and their history. Therefore, particular attention will be given to primary and secondary prevention.

Although the proportion of tumors that we can actually cure and heal has increased, and survival has improved from about 50% to almost 65%, with some forms of tumors that are curable even in 80-90% of cases, in recent years an increase in the incidence of cancer has been observed. This is due to the presence of at least three distinct phenomena: our ability to diagnose early, often asymptomatic, tumors has increased; the population is aging – and the risk of getting cancer, a degenerative disease, increases with age; and, finally, the risk factors that cause cancer still persist (and are sometimes increasing), including environmental pollution and our bad lifestyle habits.

Today we have many strings to our bow: innovative diagnostic tools, smart immunological drugs working alongside traditional ones, and extraordinary surgical skills, that allow us to achieve different therapeutic goals according to the type of disease, stage and prognosis. Treatment and prevention are based on scientific research, which should proceed with methodological rigour, integrating basic research and clinical research. Clinical studies, increasingly of a translational type, are now designed to consider samples that are more and more

homogeneous with respect to their molecular profile. A correct translational approach also requires particular attention to the scientific evaluation of current practice, in order to be able to identify “signals” in the real population which can then be evaluated in a pre-clinical setting, to verify the biological basis of the clinical phenomenon observed. It's the *real-world evidence* field.

To implement new research flows, it is also essential to join forces, and this is the mission of FITT (*Fondazione per l'innovazione ed il trasferimento tecnologico*, “Foundation for Innovation and Technology Transfer”), which sees us as an active partner, together with *Fondazione IRCCS Cà Granda Ospedale Maggiore Policlinico*, *Fondazione IRCCS San Matteo* and *Fondazione IRCCS Istituto Neurologico Carlo Besta*. FITT, which will have its headquarters in the MIND (Milan Innovation District) area, has several objectives: to develop new technologies, devices and drugs by enhancing research results and attracting investors, large companies and small and medium-sized enterprises who wish to develop new products and services.

Giovanni Apolone
Scientific Director of Istituto Nazionale dei Tumori di Milano



OUR HISTORY

From its establishment in 1928 to date, the Institute has been protagonist of significant clinical and healthcare milestones and continues to be a point of reference in oncology research. The Institute carries out a public service characterized by a high level of diagnostic-therapeutic and research activities, always guided by the fundamental and essential principles of respect for the dignity of the human being and protection of the patients and their right to receive care and the most appropriate medical treatments.

FROM THE LABORATORY TO THE BEDSIDE AND BACK

The Institute carries out a translational research which follows two paths: *From the bench to the bedside* and back, combining data from clinical practice with evidence found in the laboratory. From the systematic evaluation of the effect of treatments outside clinical trials – the RWE, or real-world evidence – we obtain signals to be taken back to the clinical and laboratory activities. The Institute has research programs and projects in every area and phase of research: preclinical, clinical, epidemiological and public health. Studies are implemented through multidisciplinary teams, which allow to go both ways.

ACCESS TO INNOVATIVE MEDICINES THROUGH CLINICAL TRIALS

INT is the Italian coordinator of several national and international clinical trials, sponsored by the industry or promoted by public bodies, for some time now also with early phase studies. Being able to participate in clinical trials allows patients to contribute to research and to have access to otherwise unavailable therapies but, given the increasingly specific and personalized nature of drugs, it is also an opportunity for treatment. For this reason, access to studies is now considered a patient's right.

A PERSONALIZED APPROACH

A modern definition of precision medicine includes the personalization of drug therapy, but also of every aspect of medicine. We are able to offer the patient screening pathways, differential diagnosis, pharmacological and



non-pharmacological therapy (including surgical radiotherapy) and surveillance programs, personalized and aimed at the individualized profile and risk. We intervene in a personalized way on the tumor and on the microenvironment, interfacing the tumor and its host: it's a return to a more holistic view of the patient.

EPIDEMIOLOGY, PRIMARY AND SECONDARY PREVENTION

The institute is very active in secondary prevention, in the identification of prognostic-predictive profiles and in optimizing the use of new immunological drugs.

ONCOLOGY TRAINING AND EDUCATION

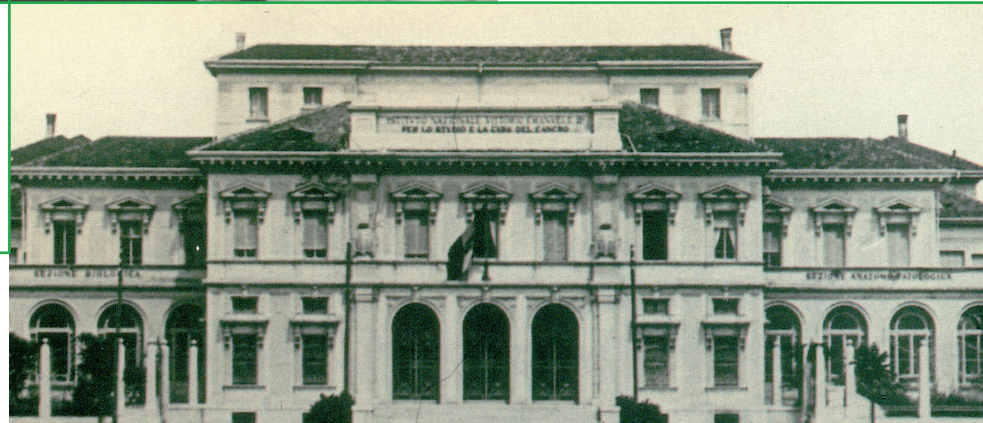
By hosting 280 university postgraduates, the Institute also deals with staff training and education, didactic activities formalized through partnerships and agreements with universities..

BETWEEN THE PAST
AND THE FUTURE
OF ONCOLOGY



The Princess of Piedmont Maria José
visiting the Institute – June 1939

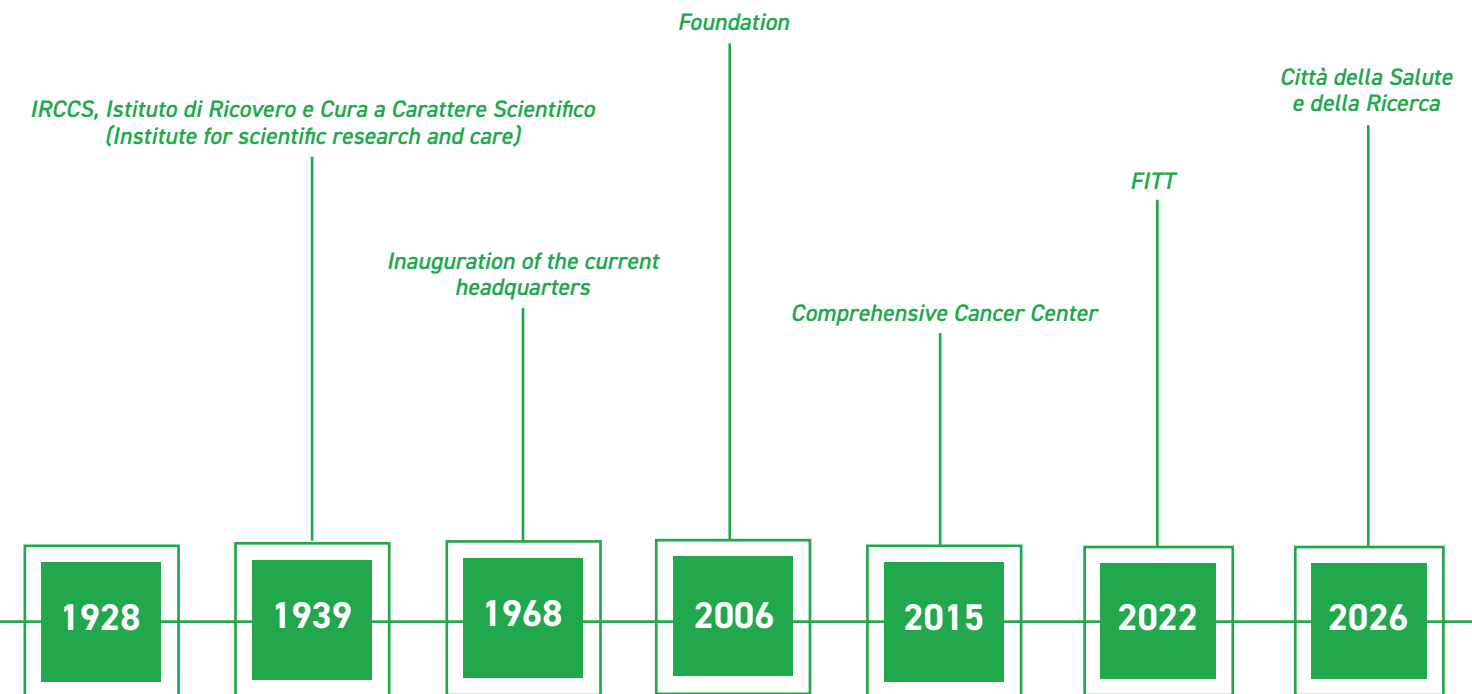
The Institute in the early 1930s



OUR PATH

In the early 1900s there were many diseases of significant social impact: tuberculosis, malaria, syphilis, typhoid, and among them cancer began to be counted, the diffusion of which was also becoming more evident following the industrialization process, which led to a change in the rhythms, lifestyles and work habits of millions of Italians. The first departments were inaugurated on April 12, 1928; in 1929, the library – which is still a source of pride today – had

over one hundred magazines on subscription. In 1939, INT received the recognition of IRCCS, *Istituto di Ricovero e Cura a Carattere Scientifico*. In 1968, the large current complex – the 12-storey single block, intended for surgical, radiological and research departments – was inaugurated. The teaching rooms and some hospital wards remained in the old site, suitably modernized. In 1978, on the occasion of the celebrations of the fiftieth



Inauguration of the Istituto Nazionale Vittorio Emanuele III per lo Studio e la Cura del Cancro ("Vittorio Emanuele III National Institute for the Study and Treatment of Cancer")

anniversary of its activity, INT was included in a circuit of global research institutions, and Corriere della Sera announced that "it has been fighting the war of the century for fifty years". On 27 April 2006, with the establishment of a new Board of Directors, INT changed its name and became a foundation under public law, the *Fondazione IRCCS "Istituto Nazionale dei Tumori di Milano"* (IRCCS "National Cancer Institute of Milan" Foundation). The words "study" and "care" – which nonetheless

continue to characterize the image of INT – no longer appear in the company name, but in fact it remains an Institute where the study of tumors, their pathogenesis and their treatment are the ultimate reason for everyone who works there. After several expansions and renovations, starting from the 1950s up to date, the Institute currently employs over 1,800 units, including doctors and experimental researchers, nurses, technicians and administrative staff. Numerous clinical trials characterized the Institute, where many milestones in the history of oncology have been placed and, even today, different therapy schemes and intervention techniques remain the only valid options for the treatment of some neoplasms. In more recent years, INT was the first Institute in Italy to conduct research on the biological and molecular characterization of tumors, which led to the identification both of the oncogenes causing thyroid cancer and of new biomarkers.

THE INSTITUTE IN NUMBERS:

17,068
HOSPITALIZATIONS

of which **12,511** in ordinary hospitalization and **4,557** in day hospital

460
BEDS

1,216,000
OUTPATIENT SERVICES

2,175
EMPLOYEES

Personnel and collaborators

DIAGNOSTIC TOOLS

- 3 MRIs at 1.5 Tesla
- 3 CATs (with 64 and 128 slices)
- 2 Direct digital mammography devices
- 1 Breast biopsy table
- 1 Digital angiographer
- 2 PET/TC
- 2 Radiochemistry laboratories
- 1 Gamma chamber
- 1 Spect/CAT
- 14 Differently dedicated radiological instruments
(9 for -graphy 5 for -scopy)
- 53 Ultrasounds

THERAPEUTIC EQUIPMENT

- 6 Linear accelerators (including three with Rapidarc)
- 1 CAT simulator
- 1 HDR brachytherapy equipment



RESEARCH

FROM THE LABORATORY TO THE PATIENT'S BEDSIDE

The Institute carries out an all-round research in all areas: in vitro, in vivo, clinical, epidemiological-public health, with a translational approach. INT employs over 650 people dedicated mainly to research, whose financial volume amounts to over 61 million euros. The 27 research laboratories are located in Via Giacomo Venezian, Via Giovanni Antonio Amedeo and Cascina Rosa. From a scientific point of view, in the field of cancer treatment and research INT is confirmed as a reference center for both the more frequent forms of cancer and the rarer ones, such as sarcomas, onco-hematological and pediatric neoplasms. In 2022, these activities made it possible to conduct 822 clinical studies, allowing more than 18,000 patients to enter research protocols. Twenty-seven international projects

funded by the EU are currently underway, of which 18 were approved in 2022. The number of scientific publications is constantly growing, and, in 2022, 850 studies appeared in important international scientific journals, of which 43% with an INT researcher as reference author.

With the explosion and wide availability of innovative technologies for the profiling of the biological-genetic and molecular aspects of cancer, in the fields of genomics, proteomics, transcriptomics and metabolomics, the Institute is present with leading laboratories, technologies, researchers and studies in the most advanced fields of biological-translational research.

INT portfolio has also 10 patents, and 5 are the Institutional Pathology Registers to determine the prevalence of conditions and evaluate their prognostic factors and the results of therapeutic choices.



RESEARCH DEPARTMENTS

The Scientific Direction coordinates the research activity carried out in the two departments of the Institute. The first, named **Experimental Oncology**, brings together and integrates the skills and goals of epidemiological, genetic, immunological and biological research in a coordinated and synergistic activity which – by responding to clinical and basic research questions and the needs of public health – contributes to the constant improvement of cancer patients' care and population

health. It is constituted of 8 structures which, by participating in joint multidisciplinary and cross-sectional oncology research activities, implement knowledge in some priority areas, which are: etiology of tumors, prevention and response to treatments with conventional or innovative drugs, survival and quality of life.

The second research department, **Epidemiology and Data Science**, is the interface with the Clinical Departments to facilitate the transfer of knowledge and information from preclinical to clinical research, and vice versa, and to make tools, resources and skills useful for this purpose available to pre-clinical and clinical researchers, developing technological and analytical platforms, with particular reference to genomics, epigenetics and transcriptomics; bioinformatics and integration of the information generated by omics studies; and isolation and characterization of cell subpopulations from tissue samples and liquid biopsies. It includes 4 structures engaged in research sectors concerning biomarkers, molecular pharmacology, medical statistics and biometrics. Furthermore, through a synergistic collaboration with the two Research Departments, thanks to the support of dedicated Structures and Offices, the Scientific Direction facilitates the conduct

of sponsored and non-profit clinical studies in the four Clinical Departments where the public health activity and the Foundation's clinical research are carried out.

DEPARTMENTS AND AREAS OF CARE

The Departments

The Department, in line with the strategic guidelines of the Institute, ensures and coordinates the healthcare, training and research functions assigned to its units, favoring the multidisciplinary approach of professional skills and the integrated use of all resources, in order to ensure quality healthcare and research services, according to criteria of effectiveness and appropriateness.

The pursuit of the strategic lines of the Institute – as well as the following medium-long term objectives – and the guidance of the complexity of the activities imply an organizational structure that allows to support the need for responsibility and governance in the various areas, such as healthcare, research and administrative.

Department of oncology surgery

The Department is responsible for building constantly updated care processes, inspired by the principle of patient centrality and always based on the best available scientific evidence, and for pursuing an intensity-based care model, where human and technological resources are managed with shared methods, also pursuing



the optimization of treatment pathways, starting from the pre-hospitalization setting, and developing surgical Day Hospital and Week Surgery activities.

Department of oncology and hematology

The Department aims to achieve excellence in the field of prevention, diagnosis and treatment of hematological neoplasms in the adult patient, solid and hematological malignancies in the child, and transfusion medicine, through organizational and managerial innovation and the development of clinical-scientific research in a context of constant attention to the quality of the service provided to the people treated.

Department of diagnostic imaging and radiotherapy

The Department is oriented towards the implementation of so-called biological imaging and the use of imaging for the optimization of radiotherapy. Within the Department, new radiopharmaceuticals are developed, which allow both the selective visualization of tumors and their treatment, as well as metabolic radiotherapy approaches. The activities



are the result of an intense collaboration of numerous experts, belonging to different fields: radiologists, nuclear doctors, radiotherapists, oncologists, physicists, chemists, radio-chemists, biologists, engineers, biometricians.

Department of services and advanced diagnostics

The Department provides the best diagnostic, prevention and treatment support for cardiovascular and respiratory complications of cancer patients hospitalized in the Foundation's structures, and is characterized by competence, timeliness, technology and integration. In an era of evidence-based medicine, the Department of Services and Advanced Diagnostics is a transversal entity that constitutes an essential operational step for any medical or surgical procedure.

Administrative and technical department

The Department coordinates the administrative and technical activities, and contributes to the achievement of the strategic and organizational objectives defined during the planning stage, activating the procedures and making operational and management tools available to support the activity of the entire Institute. In addition to administrative and general services for healthcare and scientific activities, the Department provides reception services, the acquisition of economic and financial resources and the procurement of goods and services and facilitates the sharing and integration of the processes of acquisition of human resources, their training and their evaluation.



The "Cascina Rosa" campus hosts the structures that deal with research in the field of epidemiology, prevention and public health



The Cascina Rosa Campus houses the Department of Predictive Medicine and Prevention, made up of different structures that mainly deal with research in the field of epidemiology, prevention and public health.

These are the complex structures of Epidemiology and Prevention, Analytical Epidemiology and Healthcare Impact, Clinical Epidemiology and Trial Organization, and the simple structures of Cancer Registry, Environmental Epidemiology, Evaluative Epidemiology. In Cascina Rosa there are also the departments of Medical Statistics, Biometrics and Bioinformatics of the State University of Milan, which support the Campus projects.

Unique of its kind, the Cascina Rosa Campus organizes several training initiatives, open to the public, on primary prevention, to raise awareness among healthy citizens as well as patients of the importance of adopting behaviors capable of avoiding or reducing the risk of developing cancer. The natural cooking courses organized by the Organizations operating in the Cascina welcome hundreds of people every year. Furthermore, the Campus allows participation in research projects for the prevention of age-related chronic diseases, such as diabetes, cardiovascular diseases and tumors. The products used in the different projects come directly from the synergistic vegetable garden created specifically in the Cascina six years ago.

Editorial coordination and graphic design

Noesis Communication - Milan

Presidency - Corporate communications and external relations office

Last update – March 2023