



Scientific Research at San Raffaele University Hospital



**I.R.C.C.S. Ospedale
San Raffaele**
50 anni di Ricerca.



UniSR

Università Vita-Salute
San Raffaele

*Scientific research is the best tool we have to ensure a future increasingly free from **disease**. Indeed, our experience of recent years shows us that **there is no cure without research**.*

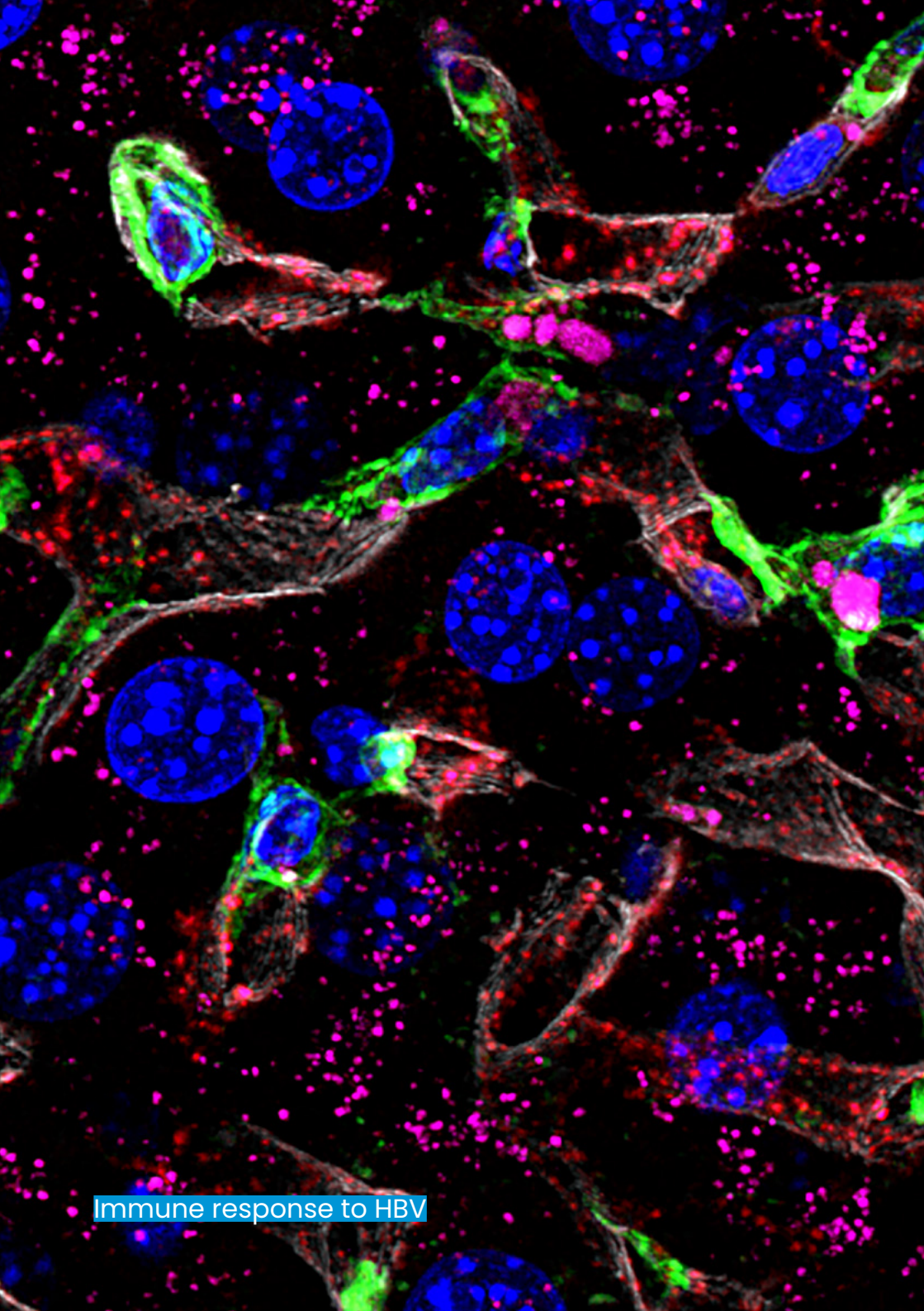
San Raffaele University Hospital, home to world-renowned doctors and researchers, has always made biomedical scientific research its raison d'être. Over the years, many discoveries have allowed us not only to live healthier lives, but also, most importantly, to fight and defeat diseases considered incurable in the past.

*To make sure we can continue making invaluable medical advances **we need your support**, we need you to continue believing in our research and to fight by our side, certain that **only together can we truly hope for a future free from diseases**.*



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Immune response to HBV

The campus

The **San Raffaele Campus** reflects its triple identity: a place where research, clinical practice, and training interact every day, promoting new ideas and shared projects.



The Campus covers an area of 290,000 mq and includes the clinical wards and research laboratories of the **San Raffaele Hospital** along with areas dedicated to research and advanced training of the **Vita-Salute San Raffaele University**.

The Hospital and the University, both facilities of **Gruppo San Donato**, work together in synergy. The collaboration between both institutions, ensures mutual enrichment and produces excellent results which are recognized worldwide.

Clinical units and research groups at San Raffaele Hospital

San Raffaele Hospital, established in 1971, is capable of offering specialized care for the most complex medical conditions.

In 1972, the hospital was officially recognized as a research hospital (Istituto di Ricovero e Cura a Carattere Scientifico, IRCCS), and in 2012 it became part of Gruppo San Donato.

With over 60 clinical units and 100 research groups, **San Raffaele combines both clinical and scientific activities** through a translational approach whereby discoveries made in the laboratory inform clinical practice and research is driven by clinical needs.

1800

People
dedicated to
research

100

Research Groups

60

Clinical Units



Advanced teaching and research: Vita-Salute San Raffaele University

Established in 1996, Vita-Salute San Raffaele University is today one of Italy's most prestigious universities, and the top ranking academic institution for the quality of its scientific work.

The University comprises 3 Faculties: Medicine and Surgery, Psychology, and Philosophy, which offer Bachelor's and Master's degrees, postgraduate courses, and doctoral research and masters programs.

Since its foundation, Vita-Salute San Raffaele University has distinguished itself by its close ties between teaching and research in its various aspects: biomedical, philosophical, and social. The mission of the University is to answer the question "*Quid est homo?*", in the belief that a human being is biologically, psychologically, and spiritually unique.

5000

Students enrolled

19

Three-year
Bachelor's degree
and Master's degree
programs

1st

University in Italy for
medical science





Our mission



At San Raffaele, research and care are two faces of the same coin: laboratory discoveries are turned into new therapies as quickly as possible, so research activities are driven by the patient's needs. All this is made possible thanks to the teamwork of our researchers and clinicians, whose knowledge and skills, personal involvement, and passion contribute to scientific advancements.

Understanding Preventing Treating



What we do

- **We study** the biological and molecular mechanisms of diseases
- **We design and test** increasingly effective therapeutic strategies
- **We develop new methods** for early diagnosis to enable a timely intervention

The diseases we study

- Infectious
- Neurological and psychiatric
- Autoimmune
- Oncological
- Genetic and rare
- Cardiovascular
- Metabolic

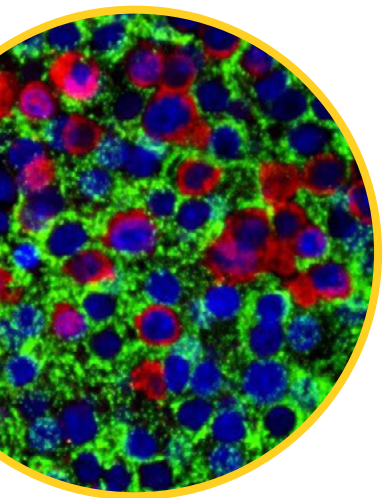
San Raffaele University Hospital also aims to develop new technologies in the fields of genomics and imaging, essential for supporting **increasingly personalized medicine**.

A history of excellence



The 50 years of research of San Raffaele include discoveries that have made the history of medicine in recent years. Many of them have already become part of clinical practice, saving patients' lives.

Nerve cells isolated from a portion of the hippocampus



The first transplant of pancreatic islets in patients with type 1 diabetes

1990

Invention of the Alfieri Stitch, a suture technique used in the treatment of tricuspid valve disease

1991



1995

First case of gene therapy in humans

1997

First infusion of genetically modified lymphocytes to increase the success of bone marrow transplants in leukaemia

1999

First corneal stem cell transplantation



2001

First cases of robotic surgery in urology

2004



First helical tomotherapy in Europe for precise radiotherapy cancer treatments

2012

Implanted one of the first full artificial hearts in Italy

2016

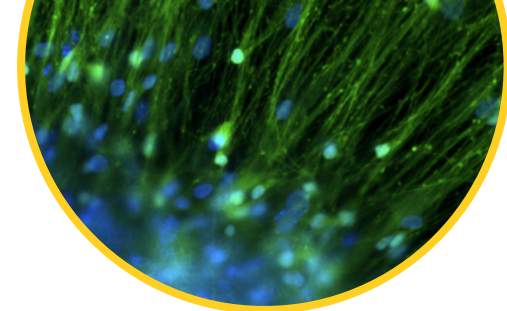
Approved the first lifesaving gene therapy for children with a rare immune disease (ADA-SCID)

2017

First clinical study with infusion of brain stem cells in patients with progressive multiple sclerosis

2020

Launched the clinical trial with CAR-T cells developed in the laboratories of San Raffaele



Research organization



4 Divisions
4 Institutes
4 Advanced Technology Centers
8 Clinical Research Centers

Cytoskeleton of a tumour cell

4 Divisions
cover the main
biomedical
investigation areas
of San Raffaele
University Hospital
through a clinical
and basic approach
to research

Neuroscience

The brain and the mind

We study the nervous system to find new treatments for neurological and psychiatric conditions

Genetics and Cell Biology

The mechanisms of healthy and diseased cells

We investigate basic cell functions to identify weaknesses in diseases such as cancer and to reveal potential therapeutic targets

Immunology, Transplants and Infectious Diseases

Our defence system

We study the immune system and the way it fights tumours in infectious and autoimmune diseases

Experimental Oncology

Our fight against cancer

We promote molecular, genetic, and cellular cancer research as well as clinical approaches to treatment

4 Institutes focus
on specific
conditions with
translational
approach

SR-Tiget

San Raffaele Telethon Institute for Gene Therapy

World-class center for the development of advanced cell therapies

DRI

Diabetes Research Institute

Excellence for the study, prevention, and treatment of diabetes

INSPE

Institute of Experimental Neurology

One of the major European institutes on research in Neuroscience

URI

Urological Research Institute

Focused on the study of prostate, bladder, and kidney cancer, and on sexual and reproductive system disorders

**4 Advanced
Technology
Centers work
to develop
cutting-edge
technologies
and methods
in genetics,
bioinformatics,
imaging, and IT**

COSR

Center for Omics Sciences

CIS

Experimental Imaging Center

CTASB

Center for Advanced Technology in Health and Wellbeing

CAST

Center of Advanced Services for in-vivo Testing



8 Clinical Research Centers endeavor to promote the “*bench to bedside*” model, with clinicians and research experts working hand in hand to expedite the discovery of new medical advances.

CANCER CENTER

Cancer Research Center

CARDIO CENTER

Cardiovascular Research Center

CARE

Center for Research in Anesthesia and Intensive Care

GASTRO CENTER

Center for Diagnosis, Treatment, and Research in Diseases of the Upper Digestive Tract

PANCREAS CENTER

Center for Clinical and Translational Research

LIVER CENTER

Center for Clinical and Translational Research

ODONTO CENTER

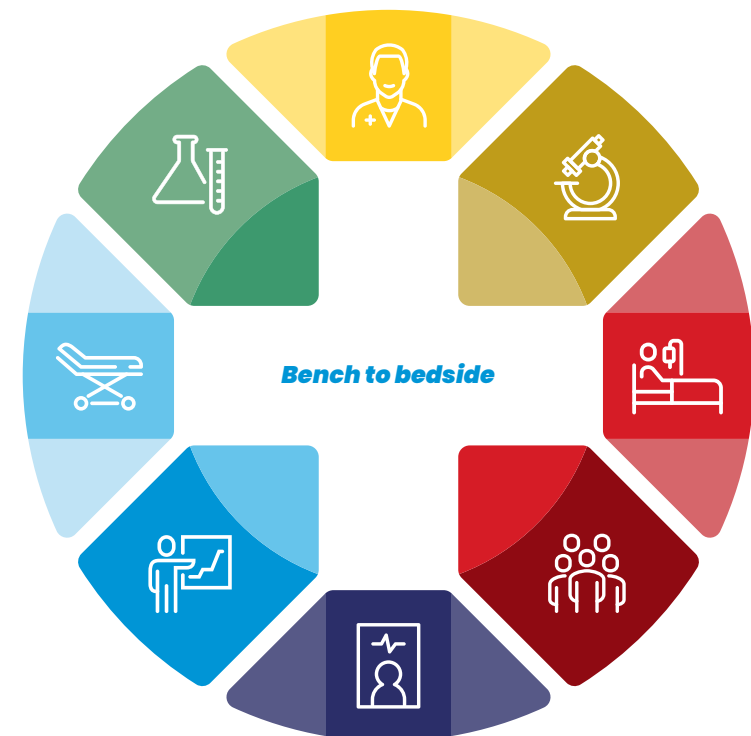
Research Center for Oral Pathology and Implantology

CERMAC

Center of Excellence for High-Field Magnetic Resonance Imaging

The dual scope of these Clinical Research Centers ensures the highest level of care now and in the future by **guaranteeing that patients have access to state of the art diagnostic techniques, surgical procedures, and pharmacological cures** while providing a fertile research environment that facilitates the discovery of new cures and medical solutions for the future. Our emphasis on translational research also allows us to offer increasingly more personalized treatments to our patients.

Moreover, the centers provide the structure and organization that permits San Raffaele to participate in countless national and international Clinical Trials, giving our patients priceless access to cutting edge treatments.



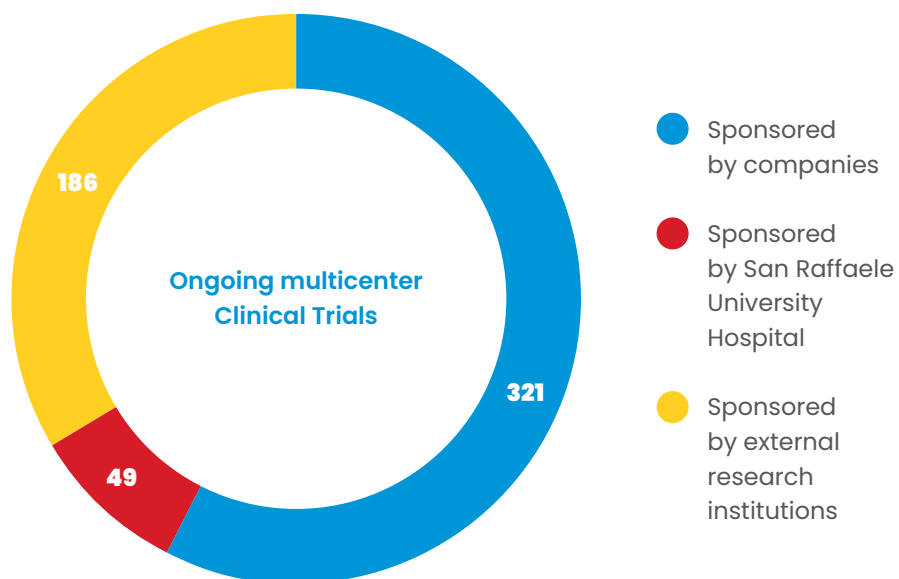
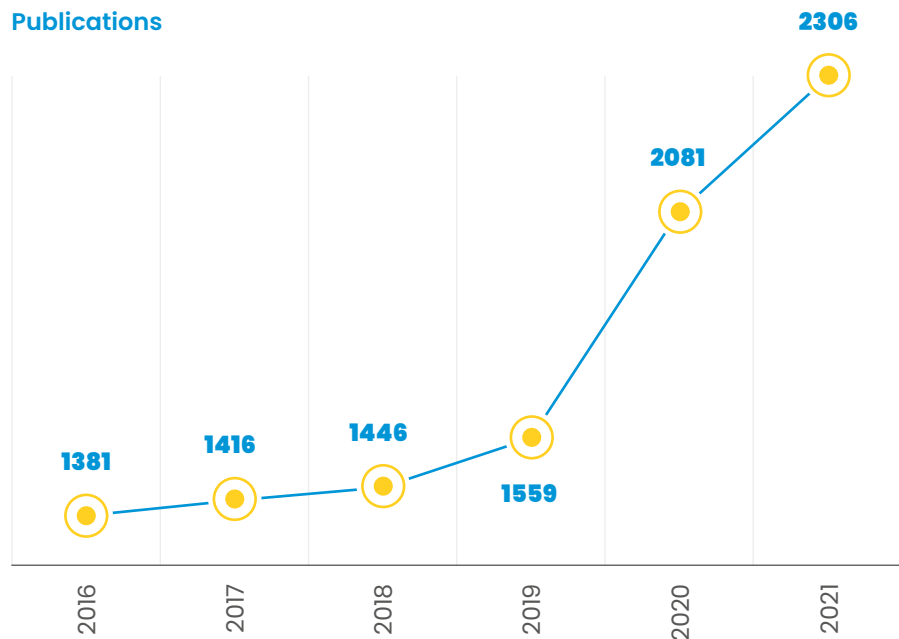
Research in numbers



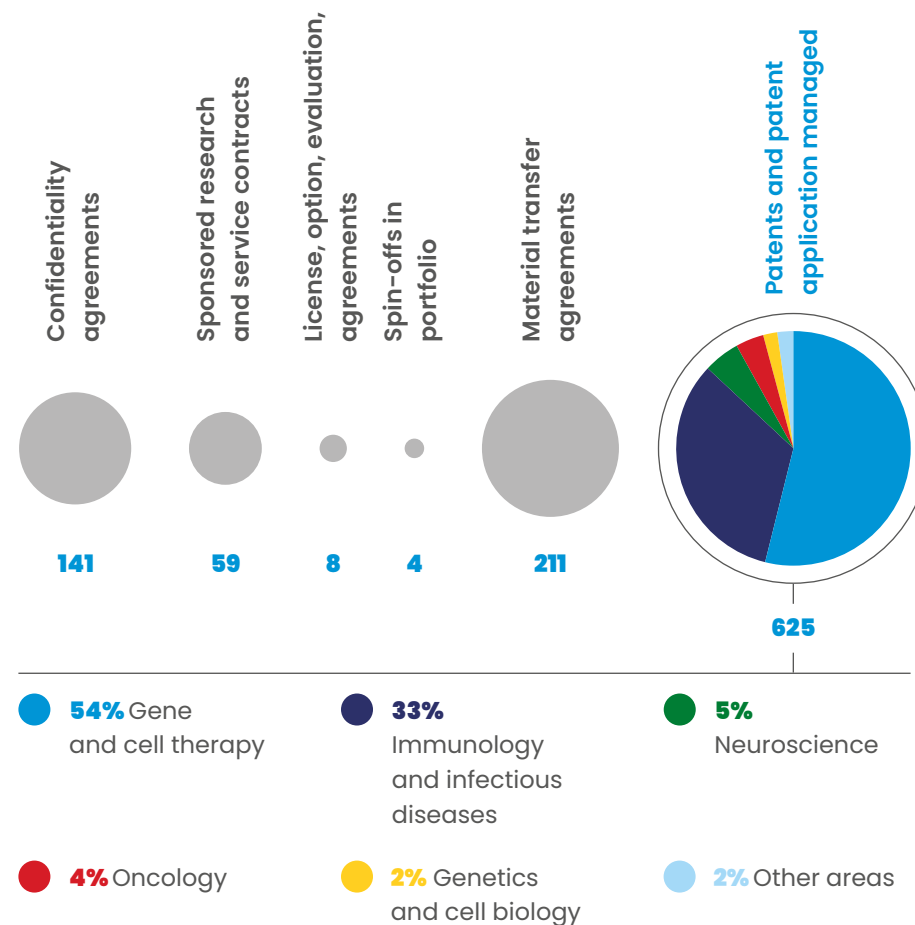
The **quality of research** conducted at San Raffaele University Hospital is confirmed each year by the number of publications in prestigious international scientific journals and the number of clinical trials approved by the Ethics Committee and conducted at the Institute.

Transplantation of stem cells for muscle regeneration

Publications



Knowledge produces value for society at large. Every year the discoveries made by San Raffaele scientists leave the laboratories and produce innovation in the real world, a success demonstrated by the number of intellectual property patents and their use.



San Raffaele holds 625 patents worldwide

These steadily growing numbers are underpinned by the passion and daily commitment of our researchers and staff.

Research is teamwork

The results of San Raffaele University Hospital are the work of



over
1800
people dedicated to
research



in over
100
laboratories



and more than
60
clinical units

A multidisciplinary team of specialists – biologists, doctors, IT engineers, chemists, and biotechnologists – share a passion for science and want to make a difference.



Since 2014, San Raffaele has won over
700
competitive grants, more than
1/3
of which were awarded by international
funding agencies

The social responsibility of research

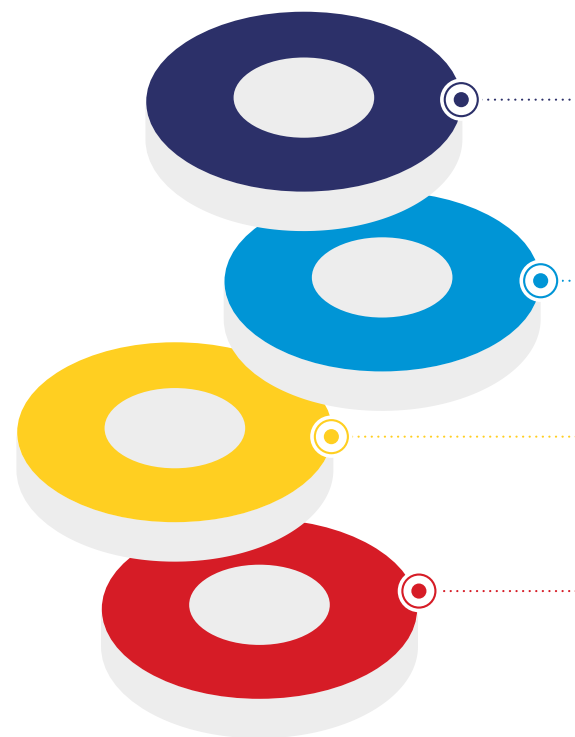


The social responsibility of research

San Raffaele University Hospital has always been committed to **ensuring research integrity** in terms of scientific accuracy, intellectual honesty, and social responsibility.

For this and other reasons, in 2017 San Raffaele was Italy's first research institute to establish a dedicated Research Integrity office.

A system of regulations and best practices ensures consistently high quality standards, and the Institute's activities are guided by the key principles of the *European Code of Conduct for Research Integrity*.



Reliability

in ensuring the quality of research in terms of design, methodology, analysis, and use of resources.

Responsibility

for the research conducted, from concept to publication, for its management and organization; for training, supervision, and tutoring of young scientists; and for its wider impact on society.

Honesty

in developing, initiating, reviewing, reporting, and communicating research in a transparent, fair, comprehensive, and impartial manner.

Respect

for colleagues, research participants, society, ecosystems, cultural heritage, and the environment.

Science outreach



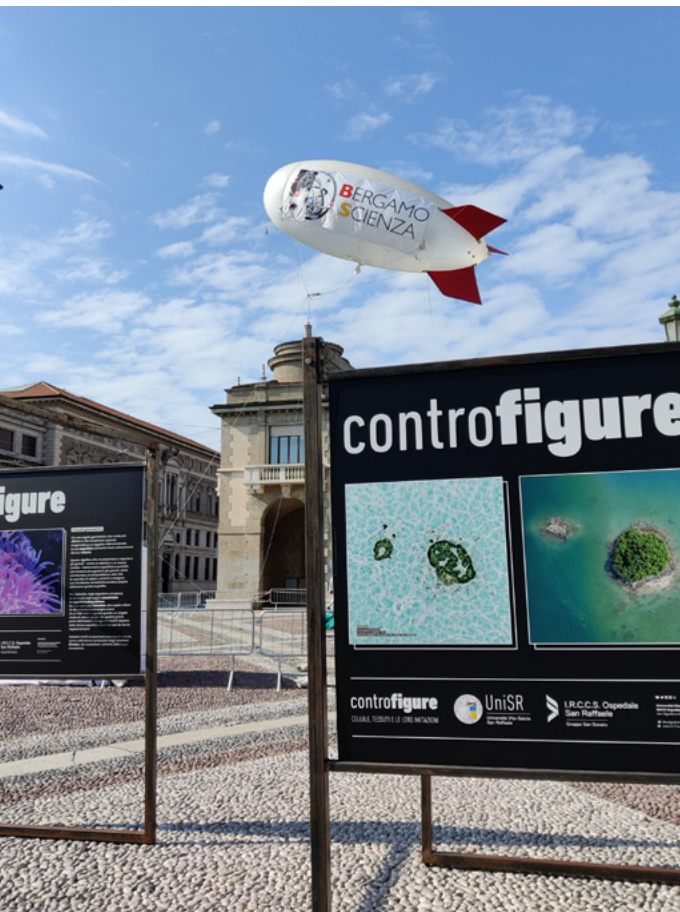
San Raffaele University Hospital has always been committed to sharing its **scientific activity and results** with the public: communicating research – thus reducing the distance between science and society, for the benefit of both – is a fundamental duty.

Cultured embryonic kidney cells

Activities in schools

San Raffaele University Hospital addresses the new generations to change the way society looks at science and interacts with it.

Each year, San Raffaele doctors and researchers meet with hundreds of students, taking their tools of the trade, their passion, and their stories to the classrooms.



Fairs and events

San Raffaele participates in the most important science fairs and informative events in Italy.

Our scientists are regularly invited to conferences to speak about their research activities. And our researchers design and run **interactive laboratories** and exhibitions aimed at involving the public on major topics in science.

Among them, *Virus. A contagious experience* and *Body doubles. Cells, tissues and their imitations*, produced jointly with Vita-Salute San Raffaele University.



Committed to accuracy in popular science

San Raffaele is committed to promoting daily information and education on **prevention and health** through its channels and through local, national, and international media.

The aim is to popularize health topics and raise public awareness on the extraordinary collective value of **biomedical research**.



Supporting research

Research requires time and financial investment. **Supporting the scientific research of San Raffaele University Hospital** is an all-important decision, particularly today. Every day, doctors and researchers endeavor to **find a cure** for diseases that are still incurable.

Our future discoveries may bear your name.
Support our clinicians and researchers.

Contact us

Fundraising Office

San Raffaele University Hospital

E-mail: donazioni@hsr.it





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