

# ANNUAL REPORT 2022



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### 2022 RETURN TO NORMALITY

After the disruptions of the past years, the AGORA Cancer Research Center's activities are back on track since March 2022. And what's more, this return to normality has added momentum to the implementation of our goals.

In order to support translational cancer research, the ISREC Foundation has decided to launch a program for projects co-led by scientists and clinicians. This so-called TANDEM program is part of the ISREC Foundation's efforts to foster collaborations among researchers from different backgrounds. The first call for proposals met with resounding success. In 2022, the Foundation hence allocated 3 million CHF to collaborative projects involving clinicians and biologists dedicated to basic research. To do so, it relied on its Scientific Board and Management, both of which worked untiringly to evaluate close to thirty applications addressing oncological questions of direct clinical relevance from two different angles: that of understanding the molecular mechanisms involved, and that of directly improving cancer patient care.



## Prof. Pierre-Marie Glauser President

The six selected research teams, in which women and men are equally represented, are located in Zurich, Bern, Lausanne and Geneva. The focus is on inter-institutional projects, as the grant recipients collaborate from bench to bedside (page 30).

The second call for TANDEM projects was launched in the fall of 2022, and many applications were received, which goes to show that such collaborations are very popular.

In January 2022, Prof. Hall took over the presidency of the Foundation's Scientific Board from Prof. Franco Cavalli, who had been its president for close to 15 years (page 23). Prof. Hall, a member of the Scientific Board since 2016, is a renowned scientist who specializes in basic research and biochemistry. A professor at the faculties of biology and medicine of the University of Basel, and a member of the Biozentrum in the same institution, he is the author of numerous scientific publications and has received many awards recognizing his research.

During the past year, several members of the Foundation's bodies received prestigious awards. Our scientific

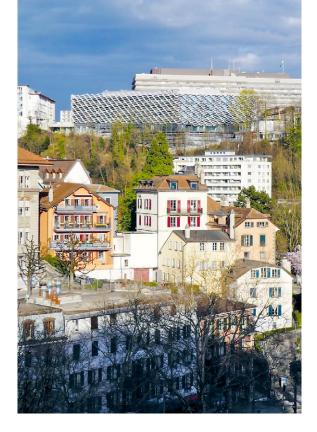
director, Prof. Susan Gasser, was awarded an honorary doctorate degree by the University of Geneva in recognition of her exceptional commitment to scientific research (page 24). A number of scientists supported by the ISREC Foundation also distinguished themselves through their scientific achievements (page 23). These distinctions honor the ISREC Foundation as well, as they underscore the scientific excellence to which it aspires.

On the occasion of our annual conference dedicated to the issues and challenges of cancer research, we had the privilege of welcoming Federal Councillor Guy Parmelin. This event was an excellent occasion to emphasize the strength of Swiss research and the fundamental importance of private foundations. The conference also offered an opportunity to discuss the challenges that our country must face to maintain its strong position in the field of research. Councillor Parmelin, like all the other participants, was invited to visit the AGORA Cancer Research Center and to interact with young scientists (page 26).

In 2022, the ISREC Foundation announced the creation of the Circle of Friends and Patrons of the Foundation (for details, see page 8). The purpose of this program is to give our most loyal donors the opportunity to join our activities based on the extent of their support, and to keep them informed about the projects they help finance. It is indeed essential that we stay in close touch with the people whose generosity allows us to move forward in cancer research.

Today, the ISREC Foundation plays a key role in the field of oncology in Switzerland, particularly in the Frenchspeaking part of the country. Thanks to its dynamism, its close connections with the academic institutions present in the AGORA building, its competences and the support of its Scientific Board, the Foundation can guarantee its donors a selection of innovative and promising projects, and a rigorous monitoring of the financing of these enterprises.

Many thanks to our loyal donors, whose generosity enables all these activities. Your support is greatly appreciated !



## THE FOUNDATION'S MISSIONS

#### **Funding Translational Oncology Projects**

The ISREC Foundation identifies, selects and supports projects that promote knowledge transfer and collaborations between basic research and clinical applications. The aim is to establish novel diagnostic and therapeutic approaches, in order to study cells and their interactions with their environment and to be able to act on the causes of dysfunctions leading to cancer.

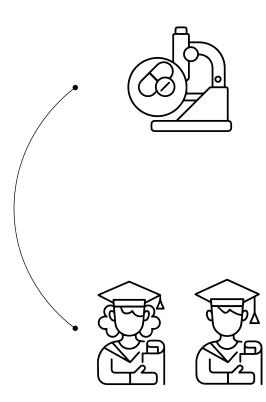
## Supporting Young Scientists and Clinicians in Switzerland

The ISREC Foundation grants scholarships to students, PhD candidates and scientists working in the fields of biology, technology or medicine, and whose research is focused on immunology and oncology.

Founded on June 18, 1964, the ISREC Foundation is a private non-profit foundation. In the last 59 years, approximately 150 personalities from Switzerland and abroad, including five Nobel Prize winners, have served on the various boards of the ISREC Foundation. The Foundation has financed significant research projects and discoveries, notably in the areas of mutagenesis, genome instability and repair, immunology, immunotherapy, the cell cycle, cell biology, tumor virology, oncogenes, cell differentiation and bioinformatics. Since several decades, research accomplished by many scientists and supported by the Foundation has been contributing to a better understanding of the mechanisms underlying cancer, and to the identification of novel therapeutic targets.

Today, the ISREC Foundation's efforts are focused on funding projects that bridge the gap between basic medical research and clinical practice, as translational medicine has a strong prospective component that needs to be promoted.

Translational research aims to convert scientific theories and laboratory discoveries into concrete medical applications, so as to improve the quality of medical and pharmaceutical care for patients. However, if this discipline is to flourish, considerable resources are



required, such as equipment that cannot be systematically financed in the framework of standard budgets, and testing phases on humans that need to be supervised by clinicians.

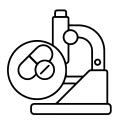
In order to have access to such innovations and to be able to improve patient care, we must eliminate obstacles and promote endeavors at the intersection of many different disciplines.

The ISREC Foundation is proud to be in a position to support such efforts, which are in line with its two core missions.

## 2022 IN NUMBERS



46 projects were evaluated



15 new projects were approved by the Foundation Council



including **6** collaborative TANDEM projects

## In 2022, CHF 12 million were allocated to oncology research projects :

#### Young scientists

5 scholarships Total amount: CHF 380000.-

2 professorships Total amount : CHF 1400000.-

#### **Research projects**

**19 oncology research projects** Total amount: **CHF 9260000.**–

### Collaborative TANDEM projects

6 oncology research projects Total amount: CHF 900000.-

## Scientific conferences and symposiums

**25 scientific conferences and symposiums** Total amount: **CHF 60000.**– Summary of all funds allocated to cancer research from 2008 to 2022

Young scientists 18 scholarships CHF 4200000.-

6 professorships CHF 28900000.–

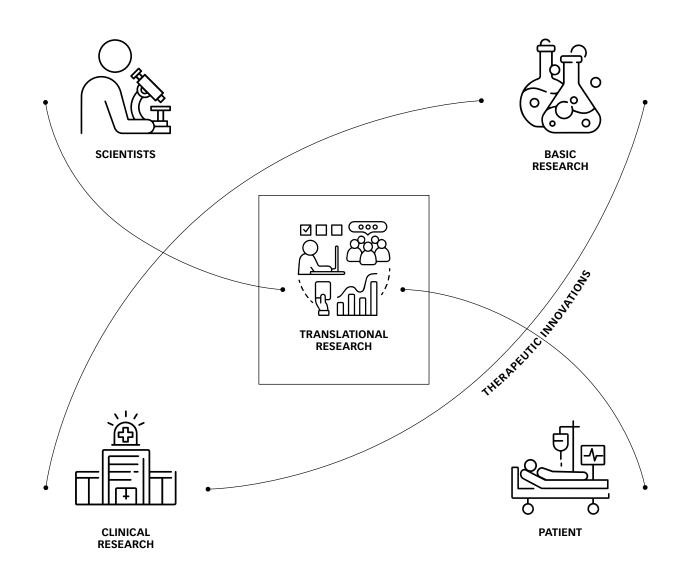
Research projects

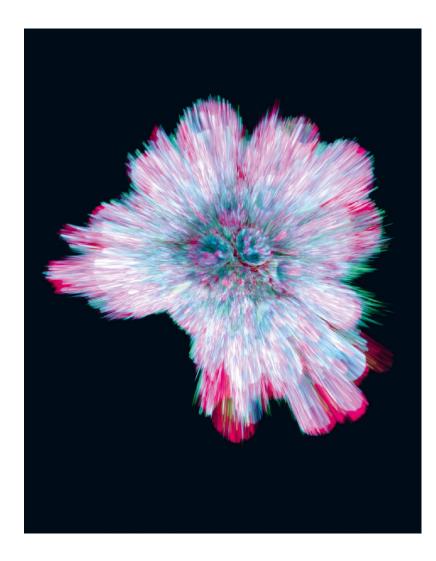
39 oncology research projects CHF 53800000.-

- Collaborative TANDEM projects 6 collaborative TANDEM projects CHF 3000000.-
- Scientific conferences and symposiums

65 symposiums and scientific conferences CHF 800000.–

Translational research helps accelerate the transfer of basic research findings to clinical research. This discipline aims to enable patients to benefit as much as possible from new therapeutic discoveries by promoting collaborative research between clinicians and basic scientists.





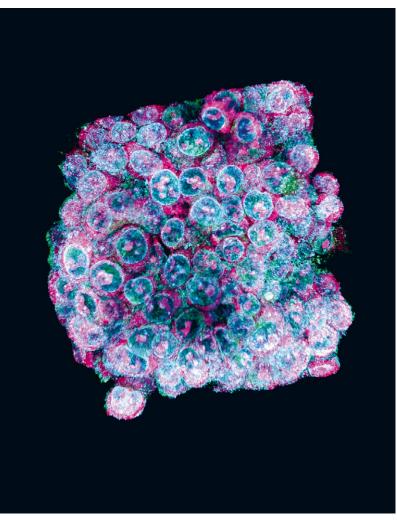


Image from the BET lab: visualization of a 3D colorectal cancer model. Image analysis software enables scientists to gain information on the state of the cells and to quantify various parameters.

Image from the BET lab: immunofluorescence labeling of a spheroid produced from a colorectal tumor makes it possible to observe the elements within the cells, such as cell nuclei (blue) and chromosomes (pink).

### CIRCLE OF FRIENDS AND PATRONS OF THE ISREC FOUNDATION

By supporting our activities, donors offer scientists and physicians the means to progress faster and further in the fight against cancer.



Undeniably, cancer research has progressed spectacularly over the past twenty years. Mortality is decreasing. Nonetheless, cancer continues to be an enduring illness for many patients, and much remains to be done to improve prevention, diagnostic tools and treatments for this complex disease.

Philanthropy plays a critical role in the funding of scientific research and enables significant advances in many fields of research, while offering scientists the freedom to carry out innovative and ambitious projects.

Oftentimes, philanthropic funds supplement public resources and are of great importance in oncological research. Without this support, certain essential topics would remain unexplored.

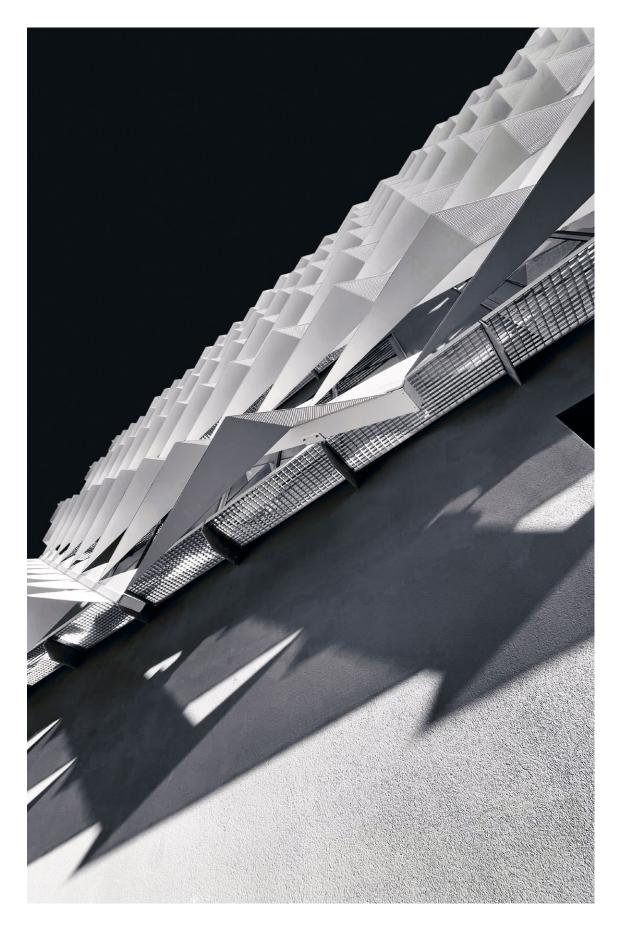
Cancer research calls for a multidisciplinary strategy combining basic research and a clinical approach. We are convinced that projects combining these two disciplines have a better chance of leading to new discoveries of therapeutic relevance. The circle of Friends and Patrons of the ISREC Foundation was established in 2022 in order to offer scientists the means to progress faster and further in the fight against cancer. By joining our circle of Friends and Patrons, you contribute to scientific progress, support groundbreaking cancer research and have the opportunity to participate in our activities.

All members of our circle receive regular updates on supported projects and current developments. Friends of the ISREC Foundation, who support us with a donation of CHF 500.– or more per year, are kept informed about the supported projects and the news of the Foundation. Patrons, who support us with an annual donation of at least CHF 10000.–, are invited each year to an exclusive event, during which they can visit cutting-edge labs and meet scientists who present their work and the latest discoveries in cancer research.

All donations are allocated to our mission of supporting translational cancer research.



To support us, you can scan the QR code and make a donation via e-banking.



## PORTRAIT OF PROF. DR. MICHAEL N. HALL PRESIDENT OF THE SCIENTIFIC BOARD



## Prof. Dr. Michael N. Hall

President of the Scientific Board since January 1<sup>st</sup>, 2022 Professor at the Biozentrum of the University of Basel

> Michael N. Hall grew up in South America, earned a Bachelor of Science in Zoology from the University of North Carolina at Chapel Hill in the US, and a PhD in Molecular Genetics from Harvard University. He was a postdoctoral fellow at the Institut Pasteur in Paris and at the University of California, San Francisco, prior to being appointed as professor of biochemistry at the Biozentrum of the University of Basel in 1987. He has held this position ever since.

> In 1991, Michael N. Hall and his team discovered a protein that regulates cell growth and cell size in yeast. Since the function of this protein is inhibited by the substance rapamycin, Hall named the growth regulator «Target of Rapamycin» or «TOR». TOR is a protein kinase activated by growth factors, nutrients, and insulin, that is conserved from yeast to man. It is a central controller of cell growth and metabolism, and plays key



«A pioneer in the fields of TOR signaling and cell growth control.»



roles in aging and the development of human disorders such as obesity, diabetes mellitus, cardiovascular disease, and cancer.

TOR inhibitors have significantly changed the management of patients with the disease called tuberous sclerosis (TS), which is a multiorgan genetic disease that causes benign tumors in brain, kidney and other organs. In 2009, a TOR inhibitor was approved for treatment of patients with advanced kidney cancer, for advanced pancreatic neuroendocrine tumors and, in 2012, for women with advanced breast cancer.

Michael N. Hall has been honored by numerous awards and prizes, including the Cloëtta Prize, the Louis-Jeantet Prize, the Marcel Benoist prize, the Hans Krebs Medal of the Federation of European Biochemical Societies, and the Breakthrough Prize in Life Sciences. He is a member of the US National Academy of Sciences, and received honorary doctorat degrees from the Hebrew University of Jerusalem and the University of Geneva. More recently he received the Albert Lasker Basic Medical Research Award, the Canada Gairdner International Award 2016 and the HFSP Nakasone Award (2019).

As of January 1, 2022, Prof. Hall, also a member of the Foundation Board, took over the chairmanship of the Scientific Council from Prof. Franco Cavalli.

The ISREC Foundation is proud to have Prof. Hall as chairman of its Scientific Board, and welcomes his participation in its Foundation Council.

## INTERVIEW WITH PROF. DENIS MIGLIORINI



Having obtained his medical degree and a doctorate at the University of Strasbourg, Denis Migliorini went on to specialize in medical oncology in Geneva (2011-2016), where he was in charge of several studies in the field of antitumor immunotherapy. He then continued his training as a postdoc with Prof. Carl June in the *Center for Cellular Immunotherapies* at the University of Pennsylvania, focusing on cell engineering. In 2019, he received the prestigious Swiss Bridge Foundation Award for his outstanding research aimed at reducing the neurotoxic effects of cellular immunotherapies.

## Prof. Denis Migliorini

Assistant professor at the Faculty of Medicine of the University of Geneva, head of the Neuro-Oncology unit at the Geneva University Hospitals (HUG) and holder of the ISREC Foundation's Brain Tumor Immunology Chair.

> In December 2019, he joined the Faculty of Medicine at the University of Geneva as an assistant professor in the medical department. He is the holder of the ISREC Foundation's Brain Tumor Immunology Chair. At the Geneva University Hospitals (HUG), he is head of the Neuro-Oncology Unit and clinical coordinator of the brain tumor biobank. His research lab is located in the AGORA Cancer Research Center in Lausanne.

#### Can you please explain what immune cell engineering is? And what are its therapeutic prospects?

Immune cell engineering combines synthetic biology and gene therapies. Thanks to viral vectors, new receptors can be added to the surface of antitumoral T lymphocytes, also called «killer T cells».

These receptors recognize molecules, so-called antigens, expressed by tumors. Engineered T lymphocytes expressing a chimeric antigen receptor (CAR-T cells) are used in highly specific cell therapies aimed at eliminating defined tumor targets.

This treatment has proven highly effective for blood cancers, with up to 90% complete remission in childhood leukemia or refractory B lymphoma in adults. The next challenge is to be able to apply this technology to solid tumors such as the glioblastoma, which is the most frequent and most aggressive brain tumor.

#### Can you please explain what a CAR-T cell is?

A CAR-T cell is a genetically modified immune cell that is used in cancer immunotherapies. Such cells are produced by taking T cells from a patient's blood and genetically modifying them to express a surface protein that is a chimeric antigen receptor (CAR). The CAR is designed to recognize and bind specific cancer cell antigens. This is how CAR-T cells target and kill cancer cells. Once the T lymphocytes have been modified to display a CAR, they are multiplied in large numbers and are re-injected into the patient. The CAR-T cells can then circulate in the patient's body, on the lookout for cancer cells that need to be eliminated.

#### One of your areas of expertise is the development of CAR-T cell treatments for brain tumors. What are the advantages of this method over other approaches?

CAR-T cells offer several advantages over other cancer treatment options. In particular, they are designed to bind very precisely to cancer cells. Accordingly, it is possible to target malignant cells while preserving healthy tissues. As CAR-T cells are capable of killing cancer cells rapidly after recognition, they can induce a swift therapeutic response. Furthermore, they can be engineered in different ways to recognize different types of cells, potentially making them effective against a wide range of cancer types. Also, their ability to survive in the patient's body for long periods of time leads to a durable therapeutic response.

Additionally, brain tumors have the ability to hide from the immune system, but CAR-T cells are able to recognize their assigned markers on the tumor cells despite this concealment strategy, which is not the case with other cell therapies.

However, it is important to emphasize that CAR-T cell therapies can also lead to potentially severe side effects such as inflammatory reactions, tissue damage, neurological disorders or cytokine release syndrome (an excessive immune reaction). Accordingly, such treatments must be carefully monitored and administered by experienced healthcare professionals.



Prof. Denis Migliorini's brain tumor immunology lab

## PROF. DENIS MIGLIORINI



Some members of Prof. Denis Migliorini's research team. From left to right: Denis Migliorini (group leader), Anna Kohl (PhD student), Luis Castillo Cantero (PhD student), Jana De Sostoa (postdoc)

#### One of the ISREC Foundation's main missions is to support young scientists and academics. You are a professor at UNIGE. How are you involved in helping young researchers?

Encouraging the next generation of scientists helps secure the future of research and the development of skills that will lead to important discoveries. This was incidentally my case as well: thanks to my postdoctoral studies in the US, I was able to implement a technology in Lausanne and Geneva that will hopefully lead to a clinical study for brain cancer patients in the near future.

By supporting young scientists, we stimulate innovation and economic development. The founding of university spin-offs, for example, creates new jobs. This is already happening at the Biopôle in Lausanne and the Campus Biotech in Geneva, where young scientific entrepreneurs trained in our institutions are launching companies focused on various biotechnological approaches.

For all these reasons, I am involved in the education of the next generation of scientists, among them biology students at the master's degree level. I also mentor medical students, young physicians undergoing post-graduate neuro-oncology training, as well as more experienced scientists, such as postdocs, some of whom aspire to set up their own research group. It is important to develop a plan for their career that will allow them to realize their dreams and thus to contribute to the advancement of science.

One project very close to my heart is the launching of a fellowship program for translational neuro-oncology studies at the HUG. The objective is to teach young physicians how to treat brain tumor patients. This specific program would be open to all physicians undergoing post-graduate training in one of the disciplines involved in such treatments (neurosurgery, neuropathology, neurology, radio-oncology or medical oncology).

## What does the ISREC Foundation's support mean to you?

Above all, the generous support of the ISREC Foundation allows us to carry out our research projects. This support covers much of the costs related to the projects, such as scientists' salaries, the purchase

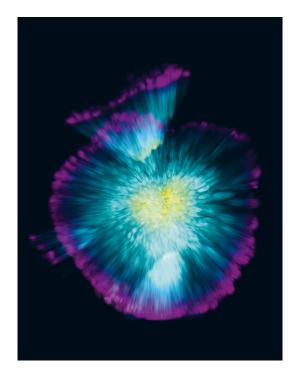


Image from the BET lab: visualization of a «mini-tumor» cultivated in the lab. The distribution of various cell populations can be studied using image analysis software. Here, the purple cells are located on the tumor's surface, while the yellow cells are situated within the tumor.

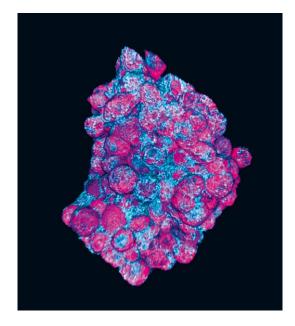


Image from the BET lab: 3D representation of the surface of a colorectal cancer «mini-tumor». A confocal microscope generates 2D images of a sample. By means of an image analysis software, these can then be assembled to produce a 3D representation of the object. The pink spheres represent the surface of the cancer cells. Blue areas show interactions between the different cells.

of equipment and materials needed for experiments, and publication costs. This contribution is crucial to the functioning of our lab. It enables us not only to take the next step forward in our projects, but also to validate new concepts that will allow us to accelerate and implement clinical studies for brain tumor patients who do not respond to the standard available treatments. Our first findings *in vitro* as well as *in vivo* in mouse models are very promising, and we would not have been able to obtain these results without the ISREC Foundation's support.

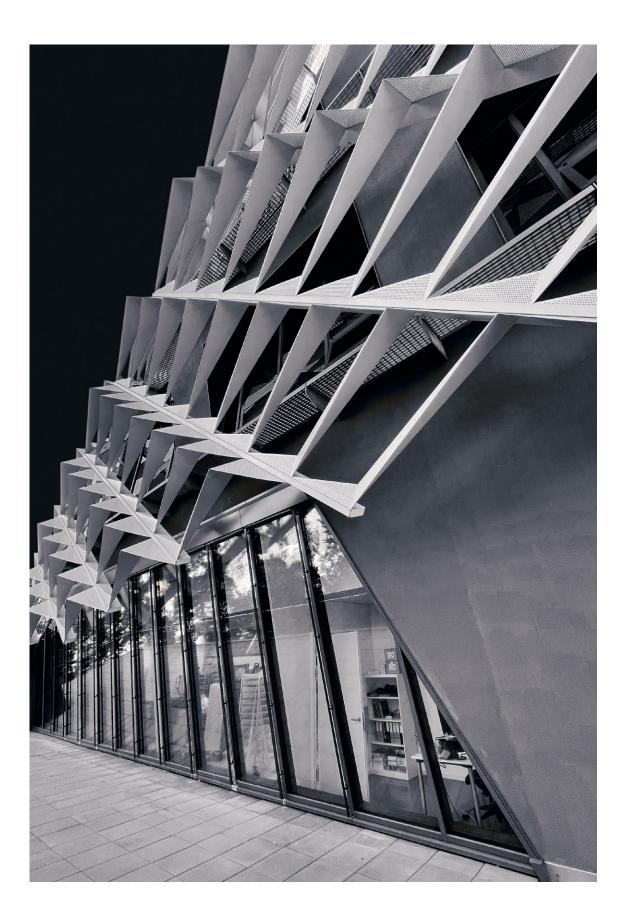
#### The ISREC Foundation depends entirely on donations. Is there anything you would like to tell the donors, both small and large, some of whom have been loyal to our cause for many years?

Donor support is vital, as donations are often used to finance high-risk or long-term research projects that are not supported by the usual funding sources.

These contributions allow scientists to innovate, to explore new ideas and to test unconventional approaches. They can also provide an opportunity to test hypotheses that have not yet been validated and to study as yet unexplored areas of cancer research. They also benefit research training programs for students, by offering fellowships and internship or mentorship opportunities. By supporting the next generation of researchers, donors contribute to the education of highly qualified scientists capable of solving tomorrow's problems. And lastly, research financed by private donations can have a significant impact on society, by leading to innovations that may improve the survival and quality of life of our cancer patients.

Donors who choose to support the ISREC Foundation and its long-standing history of furthering the fight against cancer have a significant impact, not only on research and development, but also on society as a whole.

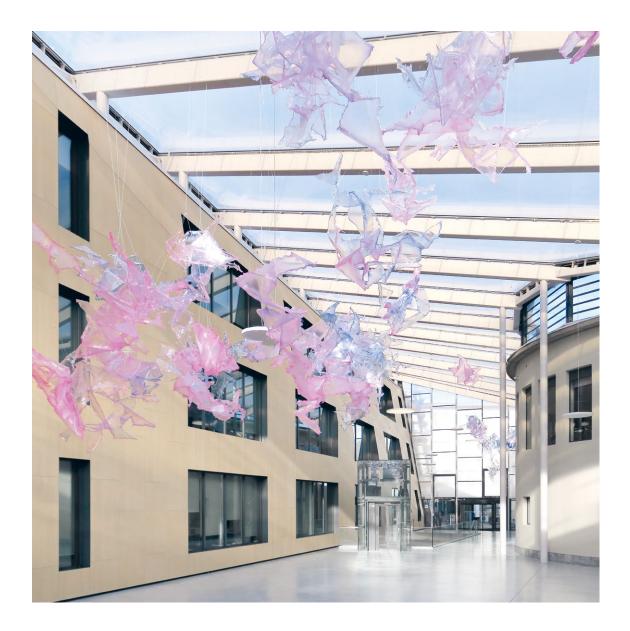
## AGORA PÔLE DE RECHERCHE SUR LE CANCER

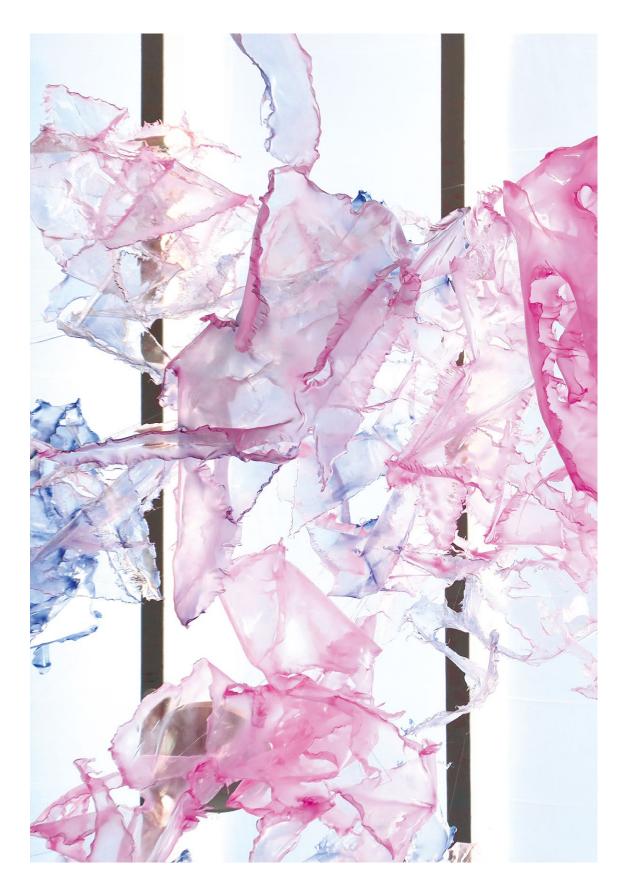




## AGORA PÔLE DE RECHERCHE SUR LE CANCER







Dedicated in June 2022, this floating work of art created by the artist Aljoscha (2020) adorns the Espace Genolier in the Atrium (see page 23).

## BIO-ENGINEERING AND TECHNOLOGY (BET) PLATFORM



## Dr. Gaspard Pardon (EPFL)

Head of the Bioengineering and Technology (BET) platform in the AGORA Cancer Research Center

Marzena Walaszczyk and Dr. Gaspard Pardon setting up a laser fluorescence microscopy system that was developed in Prof. Christoph Merten's lab at EPFL. This technology makes it possible to study the response of patient-derived cancer cells to various chemotherapies and to develop more effective individualized treatments. Gaspard Pardon obtained his master's degree in microengineering from EPFL in 2008. He continued his studies at the KTH Royal Institute of Technology in Stockholm and obtained a PhD in electrical engineering focused on micro- and nano-systems. He then completed two postdocs at Stanford University in California. During this time, he developed a novel *in vitro* model, a so-called «organ-on-chip», using cardiac cells differentiated from induced human pluripotent stem cells, to study genetic cardiomyopathies, such as Duchenne muscular dystrophy. His main interest was the impact of cardiac tissue stiffening on cell aging and the evolution of these pathologies.

Since March 2021, Gaspard Pardon is in charge of the Bio-Engineering and Technology (BET) platform in the AGORA Cancer Research Center, affiliated to EPFL and co-financed by the ISREC Foundation.

## Can you please briefly explain what the BET platform is?

The BET platform aims to provide infrastructure and technical and scientific support for the implementation and use of bioengineering approaches, such as microfluidics and organoids. In this sense, the platform strives to make cutting-edge technology and the know-how of EPFL and the engineering community more readily available to scientists working in the biomedical field. It also provides teaching, research and development activities, as well as access to specialized equipment. The platform promotes transverse collaborations between scientists of the partner institutions (CHUV, HUG, UNIL, UNIGE, EPFL, Ludwig Cancer Research Center and ISREC Foundation) to further the development and sharing of interdisciplinary expertise.

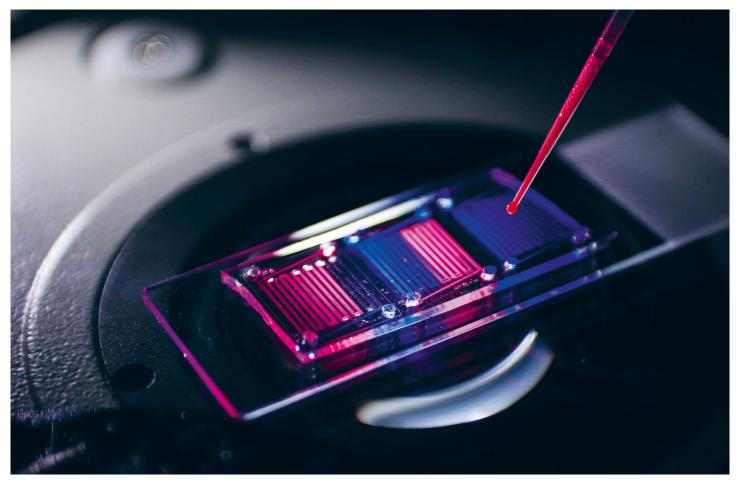


Image of a microfluidic chip in the making: two substances (fluorescent blue and pink) are injected into micrometer-sized channels. A chemical reaction induces the formation of hydrogel micro-compartments that can be used to immobilize cancer cells. The aim is to reproduce certain aspects of the tumor micro-environment to study their influence on disease progression.

#### Why is the platform located in the AGORA Center?

The BET platform is inspired by and seeks to embody the very spirit of AGORA, which aims to accelerate the impact of scientific developments on the well-being of cancer patients. The platform contributes to this mind-set by making emerging technologies more readily available to physicians and biologists.

## DR. GASPARD PARDON

Conversely, it facilitates engineers' access to the translational and clinical expertise required for the development of highly relevant technologies.

#### Translational research is at the heart of the ISREC Foundation's mission. Your platform too builds bridges between different fields of study. How does this manifest itself in your interactions with the researchers?

The ability to speak the «languages» of different scientific communities is indispensable when striving to establish synergies. Being an interdisciplinary team, we are in a position to build bridges between different fields by analyzing the problems encountered in each one, by identifying the sources of these problems and by suggesting suitable solutions. We are able to find the know-how and the partners required to best meet the needs of all involved.

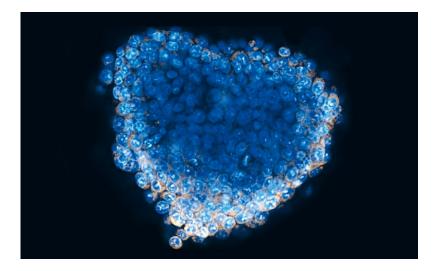


Image from the BET lab: fluorescence microscopy image of a «mini-tumor» (or spheroid) derived from a colorectal cancer cell line. Cell nuclei are stained in blue using a dye (dapi). The interior of the cell (yellow) is visible thanks to the expression of a specific gene that was coupled to a fluorescent protein in the laboratory.

#### Please tell us something about organoids. What are they? And why is this cell model so popular?

Organoids are cell clusters cultivated *in vitro* from stem cells, valued for their ability to faithfully reproduce the morphological and functional characteristics of various tissue types. They can thus serve to study human tissues. In cancer research, tumor stem cells taken from patients are used in the lab to generate avatars of the tumor. This allows us to study the specific biology of each patient's tumor and to personalize treatments based on each tumor's response in the lab. This method is also considered more ethical than the use of animals, and it allows us to reproduce human biology more faithfully than can be achieved with animal models.

## **HIGHLIGHTS IN 2022**

#### JANUARY

**Prof. Michael Hall** takes over the presidency of the Foundation's Scientific Board from Prof. Franco Cavalli, who had been its president for close to 15 years. Michael Hall is now also a member of the Foundation Council.



Prof. Franco Cavalli and Prof. Michael Hall

#### MARCH

Call for **TANDEM** project proposals.



#### JUNE

The **dedication of the Espace Genolier** took place in the AGORA atrium on June 23, 2022. Designed as an area for interaction and exchange, this space was made possible by a donation of the Clinique de Genolier. In keeping with the donator's wishes, a floating work of art created by the artist Aljoscha adorns this monumental space: art at life's frontiers, mirroring the AGORA scientists' endeavor to push back the limits of cancer research. Eighty elements, individually produced by the artist, float *in situ* to form ever-changing organisms. Fragile and sensitive, they remind us of the existential questions of life.



Dedication of the Espace Genolier

At the end of June, within the framework of the ISREC Foundation's first call for **Tandem** projects, the Foundation Council approved the allocation of **CHF 3 million for collaborations between scientists dedicated to basic research and clinicians**.

#### JULY

**Prof. Federica Sallusto** is appointed a member of the Scientific Board. Since 2000, this distinguished biologist is the director of a cellular immunology laboratory at the Institute for Research in Biomedicine in Bellinzona, where she also established the Center

## **HIGHLIGHTS IN 2022**

of Medical Immunology. She is a full professor both at the ETH in Zurich and the Università della Svizzera italiana (USI) in Lugano since 2017.

#### AUGUST

#### 23<sup>rd</sup> edition of the Oldtimer Hill Climb in Corcelles-le-Jorat

The Club Team Girard, consisting of owners, pilots and connoisseurs of old motorcycles, has been organizing annual «Oldtimer» events since 1998. On August 25 and 26, 2022, nearly 140 pilots, including 34 teams with sidecars (most of which were built before 1985), gathered for the 23<sup>rd</sup> edition of this race. The ISREC Foundation is honored to be among the beneficiaries of this event, which, to date, has donated **CHF 46 500.**– to cancer research.

#### OCTOBER

On October 14, during the Dies academicus 2022 of the University of Geneva, **Prof. Susan Gasser** was awarded an honorary doctorate degree in recognition of her exceptional commitment to scientific research.



2022 Dies Academicus ceremony: Prof. Susan Gasser with Prof. Yves Flückiger, rector of the University of Geneva (left) and Prof. Cem Gabay, dean of the University of Geneva's Faculty of Medicine.



2022 edition of the Oldtimer Hill Climb in Corcelles-le-Jorat



Performance of the Compagnie LUMEN at the ISREC Foundation's annual conference.



Federal Councillor Guy Parmelin visiting labs at the AGORA Cancer Research Center.



Meeting young scientists working at AGORA.



Speech by Federal Councillor Guy Parmelin on the issues and challenges of cancer research.

#### OCTOBER

On October 28, the annual conference of the ISREC Foundation, dedicated to the issues and challenges of cancer research, was held in the presence of **Federal Councillor Guy Parmelin**. This event was an excellent occasion to emphasize the significance and strength of Swiss research and the fundamental importance of private foundations. Councillor Parmelin was invited to visit the AGORA Cancer Research Center and to interact with young scientists. The Federal Councillor was made aware of the concerns of the researchers. Mediated by the ISREC Foundation, this meeting thus offered the opportunity to initiate a dialogue with the relevant federal agencies.

## SUPPORTED PROJECTS

#### YOUNG SCIENTISTS

The ISREC Foundation supports PhD students working in the fields of biology and medicine. In 2022, the ISREC Foundation supported the PhD theses of five students:

#### Andrea Agnoletto

Lab of Prof. Cathrin Brisken, EPFL/SV/ISREC. ISREC PhD grant to study androgen receptor signaling in the normal breast epithelium and in estrogen receptor alpha-positive breast cancer.

#### Daniela Cropp

specific T cells.

Lab of Dr. Grégory Verdeil, Department of Fundamental Oncology, UNIL. ISREC PhD grant to study the role of nfat5 in tumor-

#### Benoît Duc

Lab of Prof. Johanna Joyce, Oncology Department, UNIL/LUDWIG/CHUV.

ISREC PhD grant aiming to model and investigate the tumor microenvironment of non-small cell lung cancer brain metastasis.

#### Silvia Podavini

Lab of Prof. Margot Thome Miazza, Biochemistry Department, UNIL.

*ISREC PhD grant for the biochemical identification and characterization of PD1 signaling components.* 



#### Simge Yücel

Labs of Prof. Douglas Hanahan and Prof. Michele De Palma, EPFL/SV/ISREC. *ISREC PhD grant to study the mechanisms and therapeutic targeting of the neuronal NMDAR signaling pathway promoting breast cancer pathogenesis.* 



## YOUNG SCIENTISTS TRANSLATIONAL RESEARCH

#### TRANSLATIONAL RESEARCH

Translational research projects encourage collaborations between basic and clinical research. Their goal is to study cells and their interactions with the environment, and to provide impulses for novel therapies and clinical approaches designed to act on the causes of cellular malfunction.

#### The chairs financed by the ISREC Foundation in 2022:

#### Prof. Denis Migliorini

Tumor immunology lab/UNIGE/AGORA – ISREC Brain Tumor Immunology Chair.

This ISREC immuno-oncology chair is dedicated to the immunology of brain tumors. The associated research in this program explores new therapeutic approaches for brain tumors and in particular for glioblastoma, a highly aggressive form of the disease (page 12).

#### Prof. Mikaël Pittet

Department of Pathology and Immunology, UNIGE/AGORA – ISREC Immuno-Oncology Chair. This ISREC immuno-oncology chair is dedicated to the study of cancer immunity in context. The associated research in this program aims to discover how the immune system controls cancer and other diseases, and how it can be exploited for therapeutical purposes.

#### Projects supported in 2022:

#### Prof. Andreas Alimonti (IOR)

*Clinical research project on the targeting of tumorinfiltrating myeloid cells for prostate cancer therapy.* 

#### Prof. Caroline Arber (CHUV)

This project is financed thanks to a donation made by the Empiris charitable umbrella foundation. Its aim is to study the development of off-the-shelf allogeneic chimeric antigen receptor T cells for childhood leukemia.

#### Chantal Arditi (Unisanté)

Research project in the field of oncological care, aiming to develop a survey on cancer patient-reported healthcare experiences in Switzerland.

#### **BET – Bio-Engineering and Technology**

Participation in the funding needed to set up the BET laboratory at the heart of the AGORA Cancer Research Center. This two-way platform encompassing biomedical research communities and engineers serves as a bridge for the development of new therapies (page 20).

#### Prof. Jean Bourhis (CHUV)

The FLASH project is exclusively funded through a donation made by the Biltema Foundation. In collaboration with the CERN, this program aims to study the clinical translation, development and clinical modelling of FLASH radiotherapy treatments. This unique model will eventually enable the treatment of all types of deep-seated tumors.

#### Dr. Eva Brack (Inselspital)

Pediatric oncology project addressing methylation profiling in rhabdomyosarcoma.

#### Dr. Francesco Ceppi (CHUV)

Pediatric oncology project for the development of a CAR-T cell clinical trial for relapsed-refractory pediatric and young adult B-cell precursor acute lymphoblastic leukemia.

**Prof. Dr. rer. med. Manuela Eicher** (IUFRS/UNIL/CHUV) This nursing research project is an experience-based co-design study on patient and healthcare provider experience in adoptive cell therapies.

## YOUNG SCIENTISTS TRANSLATIONAL RESEARCH

#### Prof. Dr. rer. med. Manuela Eicher

and Prof. Olivier Michielin (IUFRS/UNIL/CHUV) This nursing research project funded through a private donation is a multicentric phase II randomized controlled trial (IePRO) for a model of care based on electronic patient-reported outcomes. The objective is early detection and management of immune-related adverse events in patients under immunotherapy.

#### Prof. Camilla Jandus (UNIGE) and Prof. Grégory Verdeil (UNIL)

Translational research project targeting novel molecular networks underlying bladder cancer recurrence and progression.

#### Prof. Johanna Joyce (UNIL/LUDWIG)

Translational research project to explore the role of neutrophils in brain metastasis.

#### Prof. Lana Kandalaft (UNIL/CHUV)

*Immunotherapy project for the development of a novel B cell-based vaccine for metastatic solid cancers.* 

#### Dr. Anne-Claire Mamez (HUG)

A clinical trial supported by the Symphasis charitable umbrella foundation, aiming to assess prophylactic infusion of donor CD45RA-negative memory/effector T cells into patients transplanted with hematopoietic stem cells from haploidentical donors after reduced intensity conditioning.

#### Prof. Chantal Pauli (USZ)

Translational research project aiming to customize treatment in cancer patients and to uncover cancer vulnerabilities.

#### Prof. Davide Rossi (USI/IOR)

Translational research project aiming to understand how clonal hematopoiesis feeds lymphoma.

#### Dr. Sacha Rothschild (USB)

A multicenter phase II trial on immune-modulatory radiotherapy to enhance the effects of neo-adjuvant PD-L1 blockade after neo-adjuvant chemotherapy in patients with resectable stage III (N2) non-small cell lung cancer.

#### Prof. Mark Rubin (UNIBE)

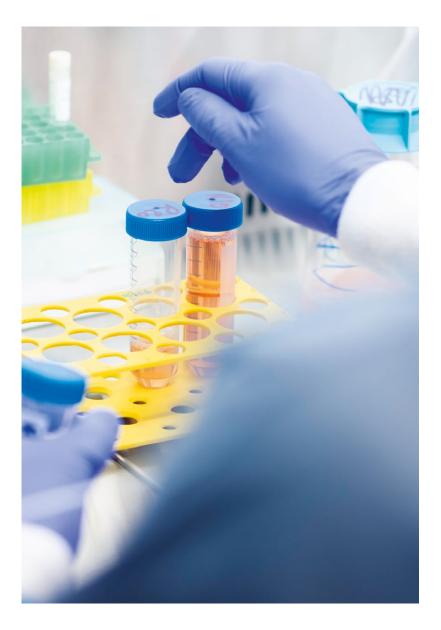
Translational research project on the use of advanced in vitro models of prostate cancer metastases to unravel and overcome ARSI resistance.

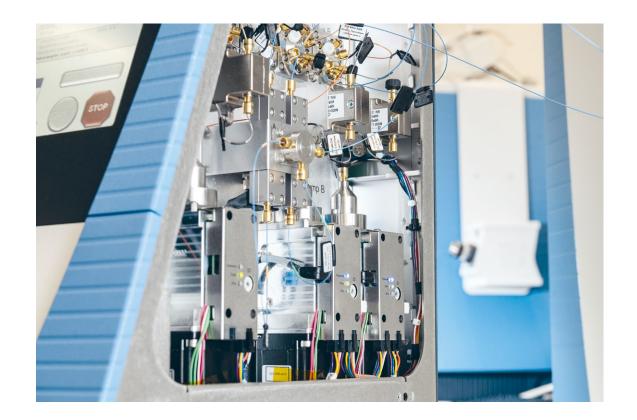
#### Prof. Curzio Rüegg (UNIFR)

Study aimed at developing a test for the early detection of primary breast cancer and breast cancer relapse.



## SUPPORTED PROJECTS



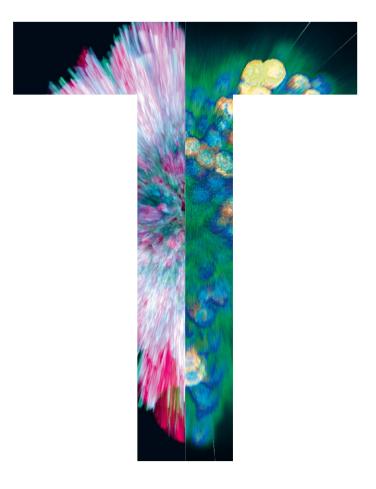


## TANDEM PROGRAM

## Congratulations to our first TANDEM laureates

It is widely agreed that creativity and innovation take place at the interface of disciplines, where two mind-sets meet to address a common challenge. Inter- or multi-disciplinary teams consisting of experts with different skills and experiences are far more productive when it comes to solving complex problems and achieving common goals. The combination of different perspectives and methods can promote the development of more innovative and efficient solutions than can be developed using conventional approaches.

TANDEM projects are collaborative cancer research programs at the intersection between basic and clinical research. Scientists and clinicians work together to translate findings from basic research into novel cancer therapies, or to develop biomarkers.



#### MOLECULAR AND SPATIAL CHARACTERIZATION OF CANCER CELL PLASTICITY TO EMPOWER DETECTION AND PREDICTION OF LUNG ADENOCARCINOMA PROGRESSION.

#### Prof. **GIOVANNI CIRIELLO**, UNIL Dr. **IGOR LETOVANEC**, CHUV

#### INVESTIGATING ENGINEERED DENDRITIC CELL VACCINES AS A NOVEL FORM OF IMMUNOTHERAPY FOR PATIENTS WITH SMALL CELL LUNG CANCER.

Prof. **MICHELE DE PALMA**, EPFL Dr. **NAHAL MANSOURI**, CHUV



Lung cancer is one of the most lethal tumor types, and there is an urgent need to improve early diagnostic approaches. The labs involved in this project have previously characterized the molecular fingerprints of tumor regions representative of early and advanced disease. Now, they will use cutting-edge molecular, technological, and computational approaches to search for and identify the seeds of aggressive tumors in the early phases of the disease. Ultimately, they will translate their discoveries into tools that can help pathologists detect the seeds of aggressive tumors in patients, in order to predict which individuals are most likely to benefit from specific treatments.



Small cell lung cancer (SCLC) is a type of lung cancer with very dismal prognosis. Unfortunately, current immunotherapies have shown little efficacy in this disease. The project team will use both experimental SCLC models and clinical material to investigate a platform of engineered dendritic cell vaccines developed in the lab. If successful, the results of this TANDEM project may help to propel the clinical testing of this new form of cancer immunotherapy in patients with SCLC.

### TANDEM PROGRAM

#### USING SUPER-RESOLUTION EXPANSION MICROSCOPY TO ENSURE THE PRECISION AND SAFETY OF THERAPIES BASED ON ENGINEERED T LYMPHOCYTES.

#### Dr. VIRGINIE HAMEL, UNIGE Dr. BENITA WOLF, CHUV

#### HARNESSING THE TUMORICIDAL ACTIVITIES OF CD4+ T CELLS TO OPTIMIZE CANCER IMMUNOTHERAPIES FOR ADULT AND PEDIATRIC PATIENTS.

Prof. CAMILLA JANDUS, UNIGE Dr. FRANCESCO CEPPI / Prof. GEORGE COUKOS, CHUV



Understanding on the nanoscale how engineered T cells interact with target tumor cells is an unmet medical need. This TANDEM research proposal aims to develop easily accessible and robust super-resolution expansion microscopy for preclinical characterization of CAR-T cell products. This project will advance our understanding of the engineered CAR-T cell immunological synapse by elucidating its molecular composition and architecture as a function of different CAR designs. The overall goal is to implement super-resolution microscopy as a standard procedure in translational immuno-oncology.



This is a highly translational project aiming at harnessing the tumoricidal activities of CD4+ T cells to optimize cancer immunotherapies. The project includes preclinical validation of TCR-engineered CD4 T cells and the setting up of a phase 1 clinical trial for relapsed and refractory solid tumors in both adult and childhood cohorts.

#### NEREUS: NETWORK-BASED DRUG RESPONSE AND REPURPOSING AT THE SINGLE CELL RESOLUTION TO ADVISE PATIENT TREATMENT CARE AND IMPROVE OUTCOME OF BLADDER CANCER.

Prof. MARIANNA KRUITHOF-DE JULIO, UNIBE Dr. BERNHARD KISS, Inselspital

#### THE MICROBIOTA-EOSINOPHIL AXIS AS A CRITICAL REGULATOR OF DISEASE COURSE, METASTASIS AND THERAPY RESPONSE IN PATIENTS WITH COLORECTAL CANCER.

Prof. Dr. MICHAEL SCHARL, USZ Prof. Dr. ISABELLE ARNOLD WALLÉN, UZH



NEREUS (NEtwork based drug REsponse and repUrposing at Single cell resolution) is focused on the multimodal characterization of the ecosystem of bladder cancer and the development of an artificial intelligence framework to advise patient treatment care and improve outcome.



The Scientific Board of the ISREC Foundation vouches for the development and scientific monitoring of these projects. Supervision and financial management are ensured by our administrative and financial management office.



Colorectal cancer (CRC) is the second most common cancer and cause of cancer-related deaths worldwide. Epidemiological studies have linked the presence of high intratumoral eosinophil levels to favorable prognosis and enhanced survival of CRC patients. However, the underlying mechanisms for this remain poorly understood. This project aims to understand whether alterations in the intestinal microbiota composition – a hallmark of CRC patients – might modulate eosinophil functions within the tumor microenvironment, thus affecting disease course, the development of metastasis and therapeutic response in CRC patients. The scientists aim to provide new avenues for harnessing eosinophil activities in CRC and will foster personalized microbiota-based precision medicine strategies for patient care.

## SCIENTIFIC EVENTS

#### **SUR/SRP Summer Program**

In 2022, the ISREC Foundation supported 7 students participating in the SUR/SRP «Summer Research» program, a collaboration between the UNIL and the EPFL. This scientific summer internship took place from July 4 to August 26 in labs of both institutions. For the students, this was a memorable and rewarding experience, which, for some, will have an impact on their future study plans. This 8-week internship offered the selected young biologists and physicians a first insight into the world of research, an enriching experience and an opportunity to network on an international level. The host labs, on the other hand, were offered the chance to discover brilliant students who might, someday, return for a Master's or PhD degree. This year again, the participants were able to visit the AGORA Center. Congratulations to these promising students!



The 2022 SUR/SRP interns and Prof. M. Gasser visiting the AGORA Center.



Animesh Awasthi c/o Prof. David Gfeller – UNIL/CHUV Indian Institute of Technology – India



Sundos Ali Naji Abu Sanad c/o Prof. Li Tang – EPFL Jordan University of Science and Technology – Jordan



Kelly Hu c/o Can Aztekin – EPFL McGill University – Canada



Alireza Tanoori c/o Prof. Pierre Gönczy – EPFL / University of Tehran – Iran



Yelyn Kim c/o Prof. Ping-Chih Ho – UNIL/CHUV Seoul National University – South Korea



Roxana Sadat Ghasemi Dehkohneh c/o Prof. Daniel Constam – EPFL / University of Isfahan – Iran



Ezzeldeen Mohammed Alswerky c/o Prof. Bruno Correia – EPFL / Islamic University of Gaza – Palestine





## Scientific conferences, symposia and workshops

In 2022, more than 200 events, **symposia** and **scientific lectures** were held in the Paternot auditorium and the lecture rooms of the AGORA Cancer Research Center, most of them directly related to research and oncology.

The ISREC Foundation also co-organized two **workshops**. In September, more than 200 researchers, physicians and scientists attended a workshop on **FLASH Therapy**. And in November, close to 130 participants gathered to discuss **the involvement of patients in cancer research**.

The ISREC Foundation will continue to prioritize oncology, so as to reflect its two main missions in the AGORA Center's program of activities, namely experimental, translational and clinical research, and the support of the next generation of scientists and physicians in this field.



## THE FOUNDATION COUNCIL

The Foundation consists of the following bodies:

#### THE FOUNDATION COUNCIL

The Foundation Council is the highest managing authority of the Foundation. It allocates resources, appoints its own members, those of the Scientific Board and the Management, as well as the Financial Auditors. It approves the annual budget and the Foundation's accounts.

#### PRESIDENT

#### Prof. Pierre-Marie Glauser

Lawyer and professor of tax law at UNIL (University of Lausanne), associate at Oberson Abels SA

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**Yves Henri Bonzon** Head Investment Management, CIO and member of the Executive Board, Julius Bär

**Prof. Nicolas Demartines** (as of February 2023) General Director, CHUV (Centre Hospitalier Universitaire Vaudois)

**Prof. Philippe Eckert** (until 31 December 2022) General Director, CHUV (Centre Hospitalier Universitaire Vaudois)

#### Prof. Dr. Michael N. Hall

Representative of the Scientific Board, Professor at the Biozentrum, University of Basel

**Bertrand Levrat** General Director, HUG (Hôpitaux Universitaires de Genève)

**Prof. Philippe Moreillon** Former Vice-Rector, UNIL (University of Lausanne), professor emeritus

#### Dr. Thomas W. Paulsen

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#### Prof. Béatrice Schaad

Director of the Communications Department, CHUV (Centre Hospitalier Universitaire Vaudois)

#### Dr. Fritz Schiesser (dès février 2023)

Lawyer and notary public, former member of the Swiss Council of States, former president of the Foundation Council of the Swiss National Science Foundation (SNSF), former president of the Board of the Swiss Federal Institutes of Technology (ETH Board)

**Prof. Andreas Tobler** (as of February 2023) Former medical director of the Inselspital in Bern and the Insel Gruppe AG, member of the board of the University Hospital Zurich

#### Prof. Didier Trono

Full Professor, GHI (Global Health Institute), EPFL (École Polytechnique Fédérale de Lausanne)

#### THE SCIENTIFIC BOARD

The Scientific Board is composed of experts of international renown in various fields of cancer research, who cannot be members of the Foundation Council, with the exception of the president of the Scientific Board, by virtue of his position. Assisted by the Scientific Board, the Management selects the research projects to be funded, and presents its recommendations to the Foundation Council.

#### PRESIDENT

#### Prof. Dr. Michael N. Hall

Professor at the Biozentrum, University of Basel

#### MEMBERS

**Prof. Dr. med. Andrea Alimonti** (as of January 2023) Director of the Molecular Oncology Department, Institute of Oncology Research, Bellinzona

#### Prof. Fabrice André

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#### Prof. Peter Johnson

Professor of medical oncology, Faculty of Medicine, University of Southampton, UK

#### Prof. Anne Müller

Associate professor in experimental medicine, Institute for Molecular Cancer Research, University of Zurich

#### Prof. Dr. Federica Sallusto

Full professor in medical immunology at the ETH Zurich and the Università della Svizzera italiana (USI), Lugano (joint professorship), member of the Research Council of the Swiss National Science Foundation (SNSF)



#### THE MANAGEMENT

Assisted by the Scientific Board, the Management selects the research projects to be funded. It develops and recommends a fundraising strategy and carries out the tasks defined by the Foundation Council.

#### Prof. Susan M. Gasser Director

Director

#### Aylin Niederberger

Administrative and Financial Director

#### THE FINANCIAL AUDITORS

The financial auditors, whose duties are determined by law, are nominated by the Foundation Council. They are elected for one year. The 2022 mandate was entrusted to **Ernst & Young SA** in Lausanne, a fiduciary company recognized by the Swiss Institute of Certified Accountants and Tax Consultants.

## BOOK OF DONORS



Since 1964, numerous donors have supported our cause through their gifts, subsidies or legacies and have contributed to the progress of cancer research.

## We are very grateful and thank each one of them most warmly.

Among these donors, more than six hundred appear in our Book of Donors:

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Two anonymous gifts / One anonymous legacy, Lausanne / Lady Elisabeth Ampthill, in Lausanne / Legacy Mrs. Anne B., Lausanne / Mrs. Annette B., Vevey / Mrs. Anne-Laurence B., Préverenges / Legacy Mrs. Wilhelmine B., Lausanne / Biltema Foundation, Amsterdam / Ceres Foundation, Carouge / Mr. Dimitri D., Pully / Mrs. Hilda D., Colombier / Mrs. Yolande de M., Epalinges / Mrs. Johannette G., Lausanne / Göhner Foundation, Zug / Mrs. Jeanne H., Neuchâtel / Mr. Jean-Pierre H., St-Imier / Mrs. Henriette H.-C., Lausanne / Legacy Mr. Hans H., Vufflens-le-Château / Helmut Horten Foundation, Lugano / Istanjac Foundation, Triesen / Lardeco Foundation, Vaduz / Lartek Limited, Bermuda / Le Laurier Rose Foundation, Lausanne / Leenards Foundation, Lausanne / Swiss Cancer League, Bern / Loterie Romande, Lausanne / Legacy Mr. Emile M., Bursins / Legacy Mrs. Marie M., Marin / Nouvelle Cassius Foundation, Vaduz / Mrs. Judith P., Lausanne / Mr. Yves J. P., Verbier / Pestalozzi Foundation, Road Town / Porthos Foundation, Triesen / Mr. Marc V., Lausanne / Canton Vaud

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