The TRANSMIT project presents:

"Fostering applicative discoveries in cancer metabolism: Patients meet TRANSMIT researchers"

January 17-18, 2020

Joseph Maisin Auditorium, UCLouvain Campus, Brussels (Belgium)

This symposium is funded by the European Union's Horizon 2020 research and innovation program within the frame of Marie Curie Actions. G.A. 722605

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Content

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Welcome address
by the TRANSMIT Coordinator

Within the context of a deep collaboration between several international and translational European laboratories, the TRANSMIT project aims to dissect metabolic remodeling in human cancers, placing the focus on the role of mitochondria and bridging basic research to the improvement/development of new therapeutic strategies against cancer.

In this context, TRANSMIT planned a two-day scientific symposium specifically addressed to patients, their families and associations/foundations. It will be held at the Brussels Campus of the Université catholique de Louvain (UCLouvain) in Brussels, Belgium, on January 17-18, 2020.

The main goal of this conference is to exchange the most up-to-date knowledge advances regarding cancer metabolism crossing the bridge between researchers and patients. Delivering the outcomes of the TRANSMIT project to patients and their associations and balancing optimistic expectations and realistic progresses will be other important tasks to be fulfilled. The target audience of this symposium will be patients, researchers and clinicians. It is intended as a bidirectional and challenging communication from researchers to patients, and *vice versa*.

After the welcome and introduction speech, we will give the stage to the people representing the only ultimate reason for cancer research, *i.e.*, patients and associations. Further, researchers with different expertise will share with young students, patients and their families and associations the deep understanding of both basic and translational research in this multifaceted challenge of cancer metabolism.

Prof. Anna Maria Porcelli

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Welcome address
by the local organizer

Dear participants in the TRANSMIT Symposium,

It is with great pleasure that I welcome you on the Brussels Campus of my university, UCLouvain, for this 2020 Symposium within the frame of the European Marie Curie ITN Project TRANSMIT.

UCLouvain is among the oldest universities in Europe: it was founded in 1425 under the authority of Pope Martin V with the support of John IV, Duke of Brabant, and the authorities of the city of Louvain. After closing during the French revolution, the university was reborn, but split in two parts during the 1970s, based on the different languages used in Belgium. The French-speaking Université catholique de Louvain (UCLouvain) established in the new city of Louvain-la-Neuve (literally 'New Louvain') created for the purpose in the 1970s, while the Dutch-speaking Katholieke Universiteit Leuven (KU Leuven) stayed in Louvain. However, the Faculty of Medicine of UCLouvain needed a university hospital in a large city, the reason why you are today in Brussels. Since then, the two sister universities evolved in parallel, with strong historic, scientific and intellectual links.

Today, I welcome you for what I hope will be a tremendous meeting, establishing links between researchers, clinicians and patients, their families and associations. It is with a great pleasure that I represent my university for this two-day symposium. I do believe that UCLouvain's motto, *Sedes Sapientiae*, the Seat of Wisdom, will apply to our fruitful exchanges. Enjoy the meeting!

Prof. Pierre Sonveaux
Luca Zampieri, M.S.

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REGISTRATION, FELLOWSHIPS & AWARDS

REGISTRATION

Registration to the Symposium is free and **no participation fee is requested**. However, for organizational purposes, each participant **must register online**.

Online registration: http://www.transmit-project.eu/transmit-symposium-2020-registration-form/

Deadline for registration: December 25th, 2019

FELLOWSHIPS

The TRANSMIT consortium offers 15 full fellowships that will cover travel and housing costs for attending to the TRANSMIT symposium. These fellowships are supported by European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 722605 TRANSMIT.

Eligibility: fellowships are addressed only to **patients** or **representatives of patients' organizations.**

Application: applicants for fellowships must submit their request together with a reference letter from Patients' organization with whom applicants are collaborating or with a motivation letter and a cover letter. Applications must be sent by email to fabit.transmit@unibo.it

Deadline for application: December 15th, 2019, at 18:00 Brussels time.

POSTERS' SESSION AWARDS

Challenge your Science! Awards will be offered to ESRs who will attend the TRANSMIT Symposium 2020 in Brussels and who will distinguish for the communicative quality of their posters. The awards will be announced on the last day of the meeting, and are supported by European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 722605 TRANSMIT.

Poster presentations:
1st Prize: TRANSMIT Award
2nd Prize: TRANSMIT Award
3rd Prize: TRANSMIT Award

Eligibility criteria: Applicant for a best poster award must be (1) an ESR enrolled in the TRANSMIT research program, and (2) first author of an accepted abstract at the TRANSMIT Symposium 2020 in Brussels.

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SYMPOSIUM PROGRAM

Friday, January 17th

Opening

09.00 – 09.15	*Welcome to the Symposium* **Pierre Sonveaux** (Université catholique de Louvain, Brussels, Belgium)
09.15 – 09.30	*What is the TRANSMIT project and its objectives* **Anna Maria Porcelli** (University of Bologna, Bologna, Italy)
09.30 – 09.45	*Meet the TRANSMITers* **Luca Zampieri (Fellows' Representative)** (Université catholique de Louvain, Brussels, Belgium)

Session 1: Metabolic rewiring in cancer cells

Chairpersons: **Sybille Mazurek (Justus-Liebig-University of Giessen, Giessen, Germany)**
Jason Locasale (Durham, USA)

09.45 – 10.15	[O1] *Identifying metabolic vulnerabilities and flexibilities of tumors* **Mariia Yuneva** (The Francis Crick Institute, London, UK)
10.15 – 10.35	[O2] *Supporting patients and their families: Dynamo Camp and the Recreational Therapy model* **Maria Elena Vivaldi** (Dynamo Camp, Limestre & Milan, Italy)
10.35 – 11.00	**Coffee break**
11.00 – 11.30	[O3] *Metabolic changes driving metastasis formation* **Sarah-Maria Fendt** (VIB-KU Leuven Center for Cancer Biology, Leuven, Belgium)
11.30 – 11.50	[O4] *TRANSMIT communication activities: children booklet and beyond* **Giuseppe De Bonis** (University of Bologna, Bologna, Italy)
11.50 – 12.20	[O5] *The therapeutic alliance as a winning approach against pediatric cancer* **Oliva Giada** (A.G.E.O.P. Ricerca, Bologna, Italy)
12.20 – 12.30	Questions
12.30 – 14.00	**Lunch break + Posters Session**

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Session 2: Cancer as a metabolic disease

Chairpersons: **Ana Mateus (Nature Cell Biology, Nature Research, London, UK)**
Giuseppe Gasparre (University of Bologna, Bologna, Italy)

14.00 – 14.30	[O6] *Glucose and amino acid metabolism in cancer* **Jason Locasale** (Durham, USA)
14.30 – 15.00	[O7] *Regulating amino acid metabolism in cancer can improve response to therapy* **Ayelet Erez** (Weizmann Institute of Science, Rehovot, Israel)
15.00 – 15.30	**Coffee break**
15.30 – 16.00	[O8] *Mechanisms of respiratory chain subunit exchanges in colorectal cancer* **Guido Bommer** (Université catholique de Louvain, De Duve Institute, Brussels, Belgium)
16.00 – 16.20	[O9] *Austrian Childhood Cancer Organization "One HEAD, many HATS"* **Anita Kienesberger** (ÖKKH, Vienna, Austria)
16.20 – 16.35	Questions

Saturday, January 18th

Session 3: From basic research to metabolic treatments

Chairpersons: **Barbara Kofler (Paracelsus Medical University, Salzburg, Austria)**
Helen Rippon (Worldwide Cancer Research, Edinburgh, UK)

09.00 – 09.30	[O10] *Investigations into proline synthesis in cancer; the influence of the tumor microenvironment and endogenous redox* **Daniel Tennant** (University of Birmingham, Birmingham, UK)
09.30 – 10.00	[O11] *In vivo and in vitro models, why do we need them?* **Oliver Maddocks** (University of Glasgow, Glasgow, UK)
10.00 – 10.20	[O12] *I´m still standing* **Izabela Grape** (Bröstcancerföreningen Amazona, Stockholm, Sweden)
10.20 – 10.50	**Coffee break + Poster Session**
10.50 – 11.20	[O13] *Targeting metabolic vulnerabilities with an OXPHOS inhibitor* **Joseph R. Marszalek** (The University of Texas MD Anderson Cancer Center, Houston, TX, USA)

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11.20 – 11.50	[O14] *Cancer as a mitochondrial metabolic disease: implications for novel therapeutics* **Purna Mukherjee** (Boston College, Department of Biology, Chestnut Hill, USA)

Closure:

Chairpersons: **Anna Maria Porcelli (University of Bologna, Bologna, Italy)**
Pierre Sonveaux (Université catholique de Louvain, Brussels, Belgium)

11.50 – 12.20	[O15] *VHL UK/Ireland Charity is a Research Team Player* **Graham Lovitt** (autoplay presentation) (VHL UK /Ireland - HLRCC Family Alliance, UK)
12.20 – 12.50	[O16] *Reproducibility and transparency in scientific publishing* **Ana Mateus** (Nature Cell Biology, Nature Research, London, UK)
12.50 –	**Lunch break and Best Poster Award**

POSTER DISPLAY SCHEDULE

DISPLAY TIME:

JANUARY 17
12.30 – 14.00

JANUARY 18
10.20 – 10.50

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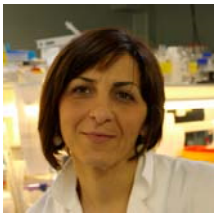
SCIENTIFIC COMMITTEE



Prof. **Anna Maria Porcelli**
University of Bologna
Department of Pharmacy and Biotechnology – FaBiT
Via Francesco Selmi 3
40126 Bologna, Italy
annamaria.porcelli@unibo.it

Prof. **Pierre Sonveaux**
University of Louvain (UCL) Medical School
Pole of Pharmacology
Avenue Hippocrate 57 Box B1.57.04
1200 Brussels, Belgium
pierre.sonveaux@uclouvain.be

Dr. **Christian Frezza**
University of Cambridge
MRC Cancer Unit
Hutchison/MRC Research Centre
Box 197, Cambridge Biomedical Campus
Cambridge CB2 0XZ, United Kingdom
cf366@mrc-cu.cam.ac.uk

Prof. **Giuseppe Gasparre**
University of Bologna
Department of Medical and Surgical Sciences – DIMEC
Medical Genetics Unit, Pol. S. Orsola-Malpighi, Pad. 11
Via Giuseppe Massarenti 9
40138 Bologna, Italy
giuseppe.gasparre3@unibo.it

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INVITED SPEAKERS & ADVISORY BOARD MEMBERS

BOMMER, Guido
De Duve Institute
Université catholique de Louvain (UCLouvain), Belgium

Guido Bommer studied Medicine first in Heidelberg and then in Munich, Germany, where he started to practice as a Physician. Between 2004 and 2008, he was a research fellow in the laboratory of Eric Fearon at the University of Michigan (Ann Arbor), where he investigated colorectal cancer and miRNAs involved in conserved signaling pathways. In 2009, he obtained a PhD at UCLouvain and in 2011 a tenure position at the Belgium National Science Foundation (FNRS) with a part-time appointment at UCLouvain. With the support of both national and European funding, his laboratory aims to discover novel metabolic pathways involved in cancer and neurodegenerative diseases. Furthermore, they investigate how these pathways are linked to canonical metabolism and how they are regulated by cellular signaling pathways.

DE BONIS, Giuseppe
Department of Pharmacy and Biotechnology – FaBiT
University of Bologna, Italy

Giuseppe De Bonis, PhD, graduated in Communication Studies from the University of Bologna (Italy), majoring in film studies and sociology. After obtaining an MA in Screen Translation (University of Bologna at Forlì), in which he carried out his internship with AIDAC – Associazione Italiana Dialoghisti e Adattatori Cinetelevisivi [Italian Association of Dubbing Dialogue Writers and Adapters] in Rome, he enrolled on a PhD program in Translation, Interpreting and Intercultural Studies at the University of Bologna at Forlì, where he conducted his research on the audiovisual translation of multilingual films. After defending his PhD thesis in July 2015, he also completed an MA in Teaching Italian as a Second Language at the University of Naples "L'Orientale" in October 2016. He is currently Research Fellow at the Department of Pharmacy and Biotechnology, University of Bologna, where he is Dissemination Assistant for the H2020-MSCA-ITN-2016 project TRANSMIT – TRANSlating the role of Mitochondria in Tumorigenesis.

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EREZ, Ayelet
Weizmann Institute of Science, Israel

Ayelet Erez was born in Israel, and completed her medical studies at the Technion Institute in Haifa, Israel. Following her Pediatric Residency, she completed a PhD in Cancer Genetics at Tel Aviv University. She then went to Baylor College of Medicine in Houston Texas, where she trained in Clinical Genetics together with being a postdoctoral fellow in metabolism. Ayelet returned to Israel on 2012 as a senior researcher at the Weizmann Institute of Science in Rehovot Israel. In parallel, Ayelet works at the Genetic Institute in Souraski Medical Center in Tel Aviv as a pediatric cancer geneticist. In her lab, Ayelet's research focuses on changes in cancer metabolism through the prism of amino acid homeostasis. She has found that in addition to changes in amino acid anabolism to support cancer proliferation, there are also changes in amino acid catabolism in the tumor, which can be identified at the genomic and biochemical levels. These findings may potentially lead to the development of identifiable metabolic alterations for cancer diagnosis and therapy.

FENDT, Sarah-Maria
VIB Center for Cancer Biology
Katholieke Universiteit Leuven (KU Leuven), Belgium

Sarah-Maria Fendt is a Principal Investigator at the VIB Center for Cancer Biology and Assistant Professor of Oncology at KU Leuven, Belgium. Sarah has a Master degree of Science in Biochemistry from TU Munich and a PhD in Molecular Systems Biology from the ETH Zurich. Sarah worked has postdoc at the MIT, before joining VIB as an independent VIB group leader in 2013. Sarah's lab is specifically interested in elucidating general regulatory principles in metabolism, and understanding cancer metabolism during metastasis formation as well as during altered nutrient availability. To perform novel research in her fields of interest, her group exploits their expertise in metabolomics and fluxomics. The research of Sarah's lab is currently funded by multiple (inter)national grants and industry, which include an ERC consolidator grant. Sarah received several awards such as the Conquer-Cancer-Now and the Grants4Targets award.

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GIADA, Oliva
Ageop Ricerca Onlus, Italy

Oliva Giada Oliva is a Journalist and Fundraiser. Following her Scientific Lyceum in Italy, she completed a BA in Communication Science at the University of Siena and a second degree in Local and International Cooperation at the University of Bologna. In Siena, Oliva obtained a Master degree in Human Rights and Humanitarian Aid. Since 2009, she is working in the social sector, focusing on migration-related issues and long distance adoption. Since 2011, she has been working as journalist and fundraiser in Ageop Ricerca Onlus (Childhood Cancer and Blood Disorders Parents Organization / Pediatric Cancer and Leukemia Research), which provides care and support to children with cancer and their families since 1982 inside the Oncology Pediatric Department of S.Orsola-Malpighi Hospital (Bologna).

GRAPE, Izabela
Breast Cancer Society Amazona, Sweden

The Breast Cancer Society Amazona in Stockholm is an organization consisting of members who are diagnosed with breast cancer and others who are related to diagnosed persons. Amazona's vision is that no one should have to suffer from breast cancer. Their mission is for everyone in the Stockholm County to have the right to the best-known breast cancer care. Their promise to their members is that no one should have to be alone with their breast cancer. Breast cancer society Amazona wants to give support and information to their members and to influence the health professionals to take care of their patients with the best-known treatments, while they also treat individuals with dignity and care. Amazona arranges a variety of activities for its members. Many of the activities take place in collaboration with healthcare professionals, such as medical specialists giving lectures on different aspects related to breast cancer. They also arrange several social and rehabilitation activities, such as discussion groups, retreats, water gymnastics, yoga, city walks, etc. When one is diagnosed with breast cancer, it is common to feel worried, scared and exposed. To support breast cancer patients, Amazona has trained support persons that can assist in the process to accept the diagnosis, give an understanding of what is going to happen and help with good advice, for example how to get a good-looking wig. Representatives of the association regularly meet with representatives of the different breast cancer-treating hospitals in Stockholm (Karolinska Sjukhuset, Södersjukhuset and St Görans Sjukhus) to discuss different patient issues and to encourage a really good care for breast-cancer patients, always with the patient in the center. They publish a magazine with 4 issues per year that addresses what happens in the association, refer lectures and address various aspects of cancer care. The work of the association is based on non-profit work from its officials. Work is funded through member fees and grants from various organizations that support a specific activity. The number of activities is fully dependent on what funding they can get.

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KIENESBERGER, Anita
Oesterreichische Kinderkrebshilfe, Austria

Anita Kienesberger has been CEO of the Austrian Childhood Cancer Organization since 2001. Her expertise allows her – together with her team – to focus on implementing projects in order to support children and adolescents (formerly) affected by cancer, building themselves a self-determined future. Through her past role as Board Member of Childhood Cancer International (2003-2014), Anita put international collaboration on the national as well as on the European agenda. Mrs. Kienesberger was founding member of the newly established Childhood Cancer International branch – CCI Europe, where she takes the leading role as Head of the Committee. By training, Mrs. Kienesberger is a pediatric nurse with specialization in oncological diseases. She was Head of the Intensive care unit at the St. Anna Children's Hospital in Vienna., Austria, for over 10 years. Through her past experiences, she developed a multidisciplinary approach to childhood cancer care. Anita holds a Master's degree in international Gender Studies and Feministic Politics.

LOCASALE, Jason
NC, USA

Jason W. Locasale, Ph.D. graduated from Rutgers University, Summa Cum Laude with degrees in Chemistry and Physics. He received his Ph.D. at the Massachusetts Institute of Technology (MIT). He then conducted his postdoctoral training at Harvard Medical School under the mentorship of Lewis Cantley as an American Cancer Society postdoctoral fellow and later as an Instructor on the faculty at Harvard in the Department of Medicine. Dr. Locasale has pioneered the use of metabolomics approaches to study cancer biology and metabolism. He has made seminal contributions to the understanding of metabolism and nutrition, including the role of serine synthesis in cancers, defining the quantitative, mechanistic principles of the Warburg Effect and altered glucose metabolism in cancer, and the role of metabolism in mediating chromatin status and epigenetics. His research combines quantitative approaches in metabolomics and mathematical modeling with biochemistry, cell biology and genetics. His current research interests are in three areas: 1) quantitative biology of metabolism, 2) the role of diet and metabolic therapeutics in health and cancer, and 3) the mechanistic basis between the interaction of metabolism and epigenetics. Each of these synergistic areas utilizes the metabolomics technologies and computational approaches that he develops, applies, and disseminates. Dr. Locasale is a recipient of the NIH Pathway to Independence Award, the Benjamin Trump Award for Excellence in Cancer Research, and the American Cancer Society Research Scholar Award. As an internationally recognized thought leader in metabolism, Dr. Locasale currently serves on the editorial board of PLoS Biology and has served numerous advisory roles for industry, philanthropic organization, and government including the National Institutes of Health office of the Director, and the National Cancer Institute. His laboratory is funded primarily by NIH. He has authored over 150 publications and numerous textbooks chapters and patents.

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LOVITT, Graham
von Hippel-Lindau Syndrome (VHL) charity, UK/Ireland
Hereditary Leiomyomatosis and Renal Cell Cancer (HLRCC) Family Alliance,
Boston, MA, USA

Graham Lovitt is the Chair of the VHL UK/Ireland Charity, which he formed in 2013, and is a Vice Chair of the Hereditary Leiomyomatosis and Renal Cell Cancer (HLRCC) Family Alliance since 2011. Under his direction, the VHL UK/Ireland Charity has grown successfully to support patients, raise awareness of the supported conditions of VHL, Birt-Hogg-Dubé (BHD) syndrome and HLRCC. The Charity has raised over £100,000 to make donations and grant awards for dedicated research. The HLRCC Family Alliance has now brought together over 500 people connected to the condition. Mr. Lovitt retired in 2009 after a long professional career in Information Technology as a Systems Designer and Quality Assurance Manager. He then became a HLRCC patient, a diagnosis initially discovered by himself on the Internet through serendipity. Mr. Lovitt with his IT and patient backgrounds has grown the infrastructure and support teams for both organizations. He is the Editor of the HLRCC Handbook, which with the help of other experts was written in lay terms for patients and physicians.

MADDOCKS, Oliver
Wolfson Wohl Cancer Research Center
University of Glasgow Institute of Cancer Sciences, UK

Oliver D. K. Maddocks is a Cancer Research UK (CRUK) Research Fellow and Group Leader at The University of Glasgow Institute of Cancer Sciences. Dr. Maddocks received a Master of Pharmacy (MPharm) degree from Cardiff University in 2003, and subsequently completed clinical training in the NHS. After a brief period as a Clinical Pharmacist Dr. Maddocks undertook a PhD at The University of Edinburgh Institute of Genetics and Molecular Medicine, investigating to role of pathogenic bacteria in colorectal cancer carcinogenesis. In 2008, Dr. Maddocks was awarded a Fulbright Scholarship to undertake a post-doctoral position at the University of Maryland School of Medicine, Baltimore, USA. On returning to the UK in 2010, he joined the lab of Prof. Karen Vousden as a post-doc at the CRUK Beatson Institute, working on cancer metabolism. In 2015, Dr. Maddocks was awarded a CRUK Career Development Fellowship to start his own cancer metabolism lab at the University of Glasgow. He was recipient of the 2016 British Association for Cancer Research AstraZeneca/Frank Rose Young Scientist Prize for his contribution to cancer research.

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MARSZALEK, Joseph
MD Anderson Cancer Center, TX, USA

Dr Marszalek's expertise spans the fields of genetics, cancer biology, neurobiology, metabolism, tumor microenvironment, HIF/hypoxia biology, RNAi, stem cell biology, target discovery, target validation and drug development. For the past 15 years, his focus has been on the identification and validation of novel oncology targets as well as their development into novel therapeutics. Over this time, his teams have performed extensive validation utilizing pharmacological and genetic tools to define the mechanism of action and role of novel and existing oncology targets in tumor biology for defined patient populations. Dr Marszalek has extensive experience leading multiple cross-functional teams in the areas of target discovery, target validation, and drug discovery. At Merck Research Laboratories, he led or was a key member of numerous programs that spanned therapeutic areas and stages of the drug discovery pipeline from early target discovery through compound development in Phase I clinical trials. Previously at DFCI and now at MDACC, he is responsible for managing multiple drug discovery programs, numerous target validation efforts and focusing on advancing therapeutics into clinical evaluation in defined patient contexts. Dr Marszalek co-lead the development of IACS-010759, which is a potential first-in-class inhibitor of oxidative phosphorylation, that is in first-in-human phase I clinical studies in AML and solid tumors. As part of his responsibilities, he led biology efforts to validate the target, define the mechanism of inhibition, define assays for lead optimization, define clinical contexts utilizing *in vitro* and *in vivo* model systems, advance the compound through IND enable activities, develop and implement clinical pharmarcodynamic assays and co-write the clinical protocol. Additionally, within the Translational Research to AdvanCe Therapeutics and Innovation in Oncology (TRACTION) platform with MD Anderson's Therapeutics Discovery Division, Dr Marszalek is the Head of Translational Biology, where his team utilizes clinical information and patient-derived models to perform translational biology activities to inform on biology and position novel therapeutic agents and combinations in defined clinical contexts.

MATEUS, Ana
NPG Nature, UK
Advisory Board Member

Ana Mateus studied biology at the University of Coimbra before entering the Gulbenkian Postgraduate Program. She then completed a PhD in cell biology and postdoctoral work on embryonic stem cells, all at the University of Cambridge. Ana then moved to King's College London to work on cancer cell biology. Before joining *Nature Cell Biology* in 2019, she worked as an editor at *Nature Communications* and *Nature Metabolism*.

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MUKHERJEE, Purna
Biology Department
Boston College, MD, USA

Purna Mukherjee, Research Assistant Professor, Biology Department, Boston College, received her Ph.D. in Science working on "Cancer Chemoprevention" from India. Dr Mukherjee trained as a postdoctoral fellow at Dana Farber Cancer Institute, Boston, on the use of diets and calorie restriction to manage cancer. She has worked with Professor Thomas Seyfried on brain cancer projects for twenty years. Her research focuses on diet and cancer, especially related to energy metabolism and energy-sensing pathways. She has published major papers in the area of tumor angiogenesis, apoptosis, inflammation, and related signaling pathways. She is a leading expert on diet/drug therapies for cancer management in preclinical models, and has authored or co-authored over 40 peer-reviewed papers on these subjects. She presently serves as a reviewer of journals like Neuro-Oncology, Neurochemical Research, and Frontiers Nutrition. Her recent paper on "Therapeutic benefit of combining calorie-restricted ketogenic diet and glutamine targeting in late-stage experimental glioblastoma" in Nature journal *Communication Biology* has caught attention in the patient and scientific community.

RIPPON, Helen
Worldwide Cancer Research, UK
Advisory Board member

Dr Rippon was appointed CEO of Worldwide Cancer Research in January 2016 after four years as Director of Research, responsible for the strategic delivery of the charity's multi-million pound global program of pioneering cancer research. Awarded a PhD in 2002 for research on prostate cancer, Dr Rippon started her career as a postdoctoral fellow at Imperial College London working in the new and blossoming field of tissue engineering. There, she authored some of the earliest scientific papers on the potential of embryonic stem cells for lung regeneration. Moving to the third sector in 2008, Dr Rippon oversaw the medical research programs of Age UK and Prostate Cancer UK, developing in-depth knowledge of research funding strategy and policy, the evaluation of research impact, science communication and public engagement. As CEO of Worldwide Cancer Research, she leads a small charity with immense ambition – to see a day where no life would be cut short by cancer. Over four decades Worldwide Cancer Research has invested nearly £200 million in research across 34 countries kick-starting the life-saving advances of the future by sowing the seeds of new discoveries today. Dr Rippon has written for the Huffington Post and The Scotsman, is an aspiring astronomer, avid Yorkshire Tea drinker and can be found tweeting all things science, running and vegetable growing @DrHelenRippon.

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TENNANT, Daniel
Institute of Metabolism and Systems Research
University of Birmingham, UK

Daniel Tennant is Principal Investigator of the Hypoxia and Metabolism research group in the Institute of Metabolism and Systems Research within the College of Medical and Dental Sciences at the University of Birmingham. Research in his group is focused around understanding the role of the metabolic microenvironment in disease etiology, with particular focus on cancer metabolism. After a PhD in diabetic peripheral neuropathy at the University of Manchester, Daniel performed his post-doctoral research at the CR-UK Beatson Institute for Cancer Research in Glasgow with Professor Eyal Gottlieb. His current research is funded through multiple sources, including Cancer Research UK, the Medical Research Council and the Paradifference Foundation.

VIVALDI, Maria Elena
Dynamo Camp, Italy

Maria Elena Vivaldi was born in Milan, the city where she currently lives. She studied Philosophy at the Catholic University in Milan and, after her Bachelor degree, she attended Social Sciences. After these to degrees, she attended a Master at the NYU University in 1996 on Non-profit organization coordination. From 1997 to 2009, Maria Elena worked in two of the main grant-making foundations in Italy: Cariplo Foundation and Allianz Foundation, taking part in the first phase of start-up and assessment of the evaluation processes. For both foundations, she led the evaluation team working on minors at risk and disabilities. In 2009, she began to work for Dynamo Camp as responsible of the Major Gift area. In these years, she developed the topics of social impact, sroi and other methodologies, applying also in concrete cases. From 2017, Maria Elena has become a volunteer at Dynamo Camp, and she is also engaged in organizing fund raising evens as ambassador. She loves running (especially marathons to raise funds) and singing (lyrical, pop music, holy music). She is married and has two daughters.

YUNEVA, Mariia
The Francis Crick Institute, UK

Mariia Yuneva obtained her PhD from Moscow State University in Russia in 2002. She worked in the laboratory of Alexander Boldyrev studying the role of oxidative stress in different pathological processes including ischemia, hypoxia and ageing. Mariia then joined the laboratory of Yuri Lazebnik at Cold Spring Harbor Laboratory, New York, as a postdoctoral fellow to work on understanding the mechanisms of nutrient dependence of oncogene-transformed cells. In 2005, she moved to the laboratory of J. Michael Bishop at the University of California, San Francisco, to continue her studies of the relationship between metabolism and oncogene-induced transformation in mouse models of cancer. In 2012, Mariia has

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started her own group at the Francis Crick Institute, London, working on establishing the connection between genetic lesions and metabolism in cancer.

LOCAL ORGANIZERS

Prof. **Pierre Sonveaux**, PhD
University of Louvain (UCLouvain) Medical School
Pole of Pharmacology
Avenue Hippocrate 57 Box B1.57.04
1200 Brussels, Belgium
pierre.sonveaux@uclouvain.be

Luca Zampieri, B.S.
University of Louvain (UCLouvain) Medical School
Pole of Pharmacology
Avenue Hippocrate 57 Box B1.57.04
1200 Brussels, Belgium
luca.zampieri@uclouvain.be

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VENUE

A FEW WORDS ABOUT BELGIUM & BRUSSELS

Belgium is a small, densely populated Kingdom in Western Europe. It covers an area of 30,528 square kilometers (11,787 square miles) and has a population of about 11 million inhabitants. Belgium took its independence from the Netherlands in 1830. Current head of the state is King Philippe. A federal monarchy, the country is divided in communities and regions. Official languages are Dutch, French and German. Its currency is the Euro. Belgium's capital Brussels comprises 19 municipalities, including the City of Brussels, and is bilingual (French and Dutch). It counts roughly a population of 1.1 million people. Brussels hosts the European Commission and the European Council, as well as the NATO headquarters. As Belgium is a multicultural country, you will have no problem speaking English in Brussels, and you will be pleasantly surprised to hear how many people speak another language too.

WEATHER

Brussels has a mild humid temperate climate with warm summers and no dry season. Classically, mid-January has an average temperature of about 3°C, with daily highs of 6°C and daily lows of 1°C. Negative temperatures are possible. Precipitation is most likely. Throughout January, the most common forms of precipitation are moderate rain and snow.

MEETING ROOM

The meeting will be held in the 'Joseph Maisin' auditorium, which is close to metro station ALMA. Coffee breaks will be in the Gerty Cori auditorium.

Location: Joseph Maisin auditorium: Avenue Emmanuel Mounier 51, 1200 Brussels
Website: https://uclouvain.be/fr/facultes/mede/auditoires.html

Access from Brussels airport: Brussels airport is located at only 7 km from the UCLouvain campus in Brussels, and serves destinations all over the world. So, wherever you are coming from, it will be an easy journey. **Bus 659** directly links Brussels airport to the UClouvain Campus. There is a bus every 30 min, and the ride lasts about 22 min. Alternatively, take a taxi (expensive) asking for UCLouvain auditoria, Avenue Emmanuel Mounier 51, 1200 Woluwé-Saint-Lambert (Brussels).

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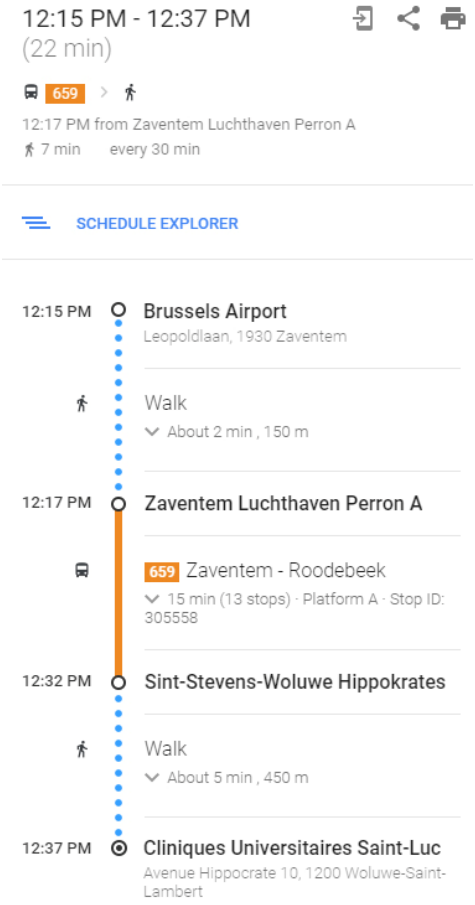

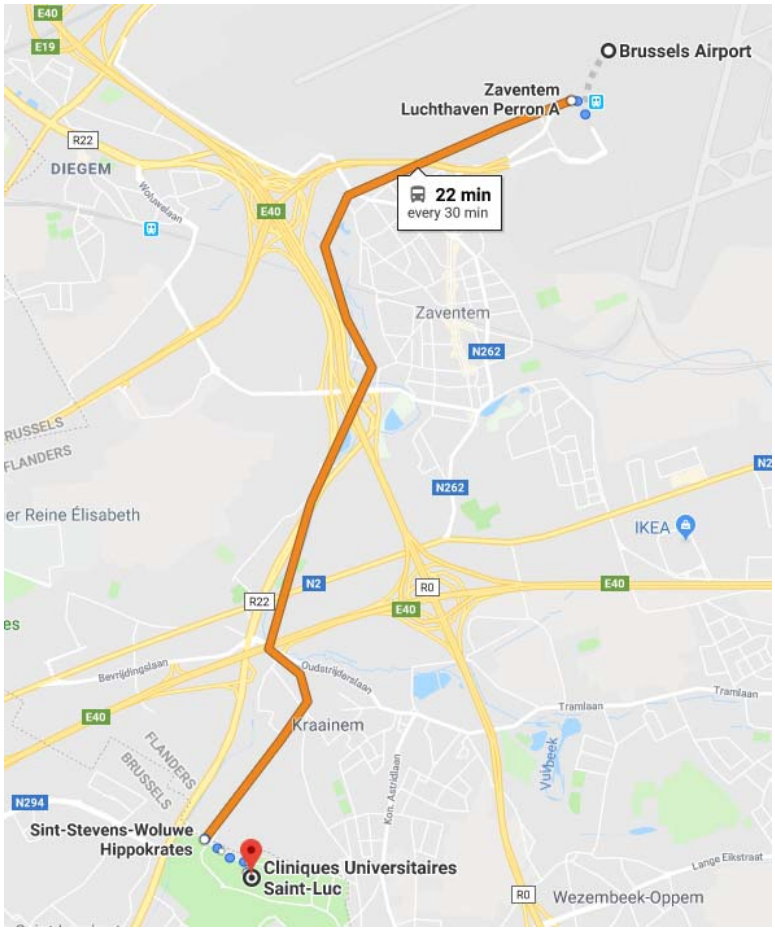

Access by car: On R0, take Exit 2 Wezembeek-Oppem, and turn to direction Kraainem. Continue on Wezembeeklaan until your reach a LUKOIL Gas Station. There, turn on right to take Avenue Emmanuel Mounier. Auditoire Maisin is at Avenue Emmanuel Mounier 52. There are parking lots along the avenue.

Access from Downtown Brussels (metro): Take the metro at any station and heads to the Alma Station, which is located on line 1 towards Stokkel/Stockel. **Exit at Alma Station**, and then follow the red track on the campus map below to reach the Maisin auditorium (5 min walk).

From **Hotel Léopold**, the closest metro station is Trône (6 min walking distance)
From **Hotel du Congrès**, the closest metro station is Madou (4 min walking distance)

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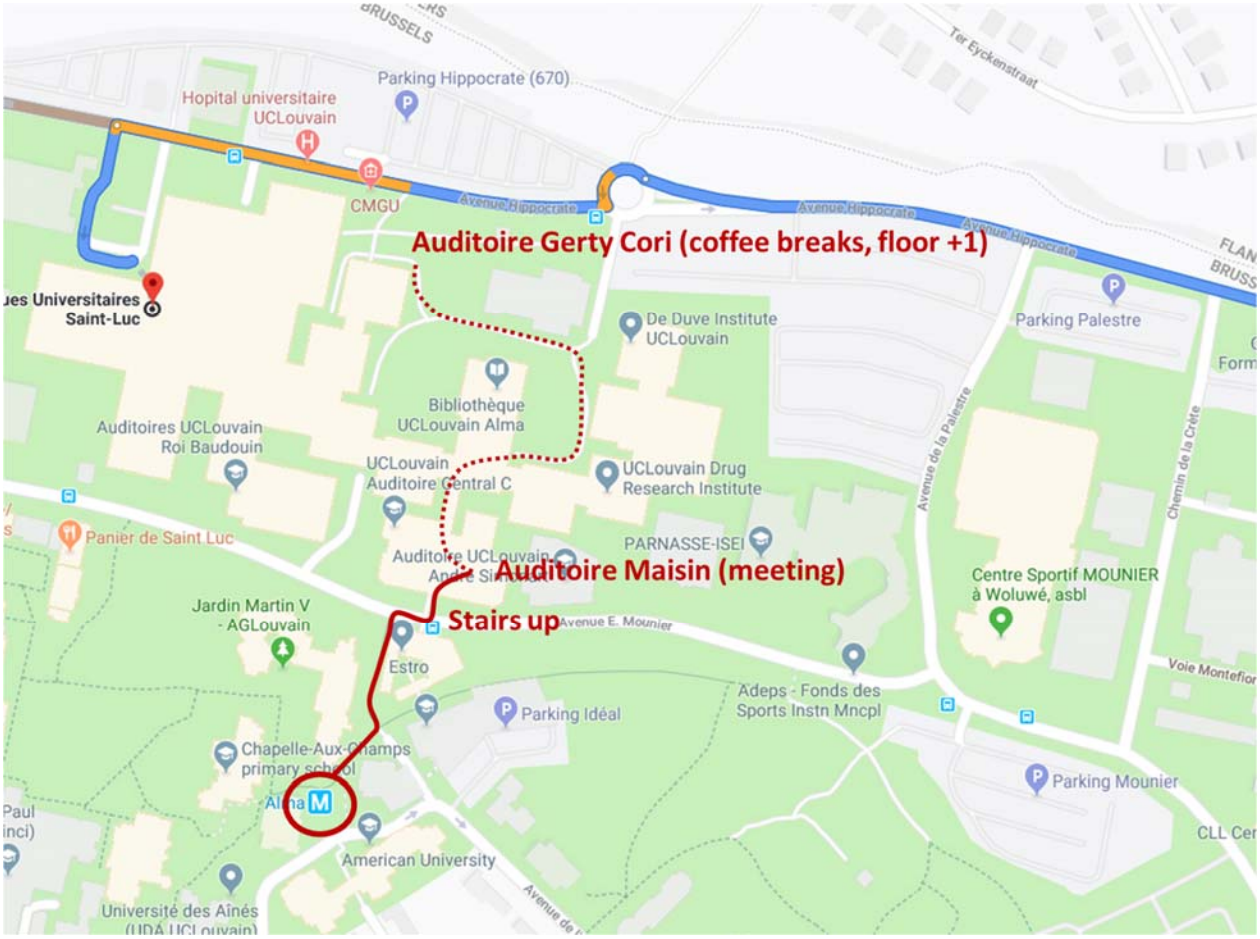
CAMPUS MAP

To reach the 'Joseph Maisin' auditorium from Alma metro station, follow the red line on the map. The room is located along Avenue Emmanuel Mounier. For coffee breaks, please join the Gerty Cori room along Avenue Hippocrate (doted red line).



LUNCHES

Lunches on Friday January 17th and Saturday January 18th will be at the restaurant "Le Martin V" in green on the campus map above. Your food preferences/intolerances/allergies have been communicated to the staff.
Address: Rue Martin V 57-85, 1200 Brussels

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SOCIAL DINNER

RESTAURANT MADOU'S FOLIE has been booked for Invited Speakers, as well as for TRANSMIT PIs and ESRs. Madou's Folie is located in a historical place dedicated to gastronomy since 1946, with a seasonal gourmet and colorful cuisine. Bistronomic and organic with fine slow food cuisine.
Time: Friday December 17th at 20:00
Address: Rue de la Presse 23, 1000 Brussels
Website: http://www.resto-madous-folie.be/?lang=en#top

To reach the restaurant from Hotel Léopold: **Follow the red line on the map.** Walking time is 17 min (1.4 Km). Take Rue de la Science until you reach Rue Belliard. Turn left to take Rue Belliard down towards the Royal Park and cross the big boulevard. At Rue Ducale, turn right until you reach a Y bifurcation. The street on the left is Rue de la Presse.

To reach the restaurant from Hotel du Congrès: **Follow the green line on the map.** Walking distance is 2 min (120 m). Take Rue du Congrès down towards the Colonne du Congrès. The first street on the left is Rue de la Presse.

To reach the restaurant from UCLouvain Alma Campus: **Follow the blue line on the map.** Take metro line 1 and exit in Arts-Loi (Kunst-Wet). Then, take Rue de la Loi down to the Royal Park, then the first street on the right (Rue Ducale). When you reach a Y bifurcation, the street on the left is Rue de la Presse. Walking time is 5 min (450 m).

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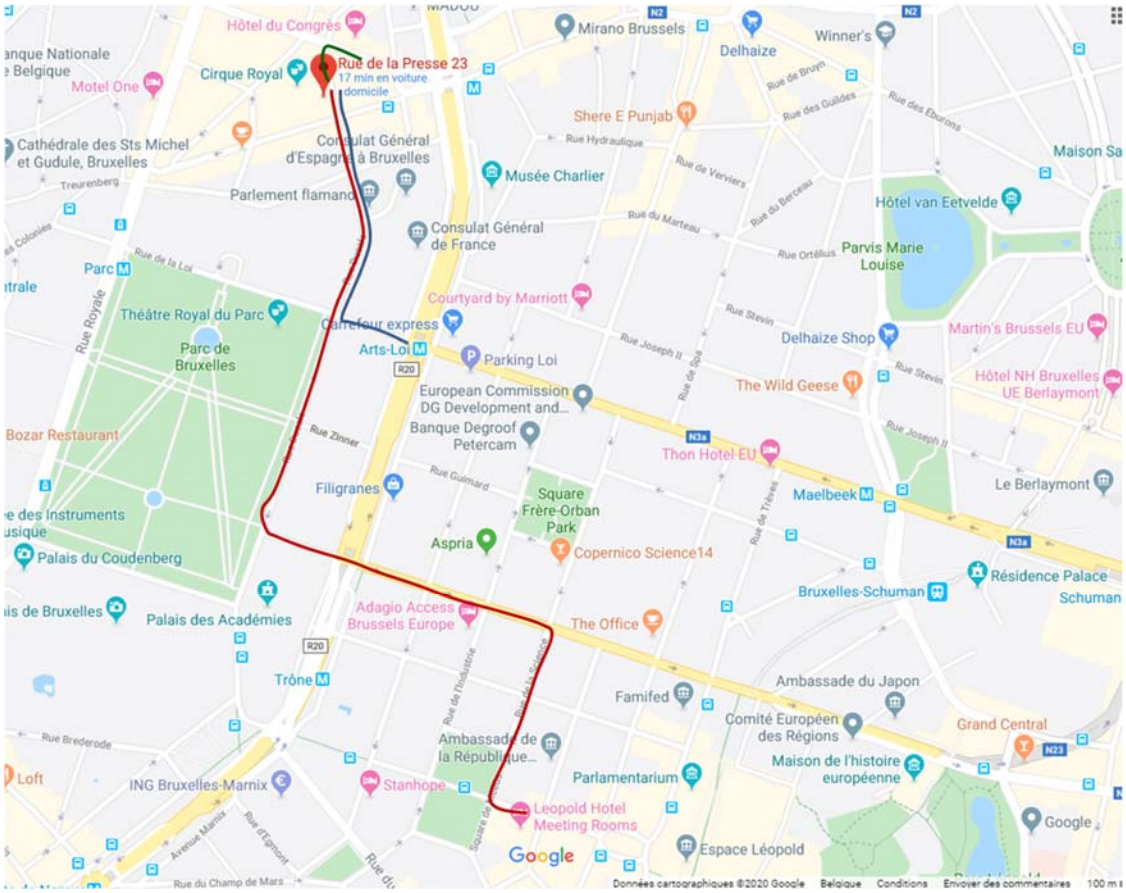

ACCOMMODATION

HOTEL LÉOPOLD has been booked for Invited Speakers and PIs of the TRANSMIT consortium. Rooms have been prepaid. **Arrival:** 15:00. **Departure:** no later than 11:00.
Address: Rue du Luxembourg 35, 1050 Brussels
Website: https://www.hotel-leopold.be/en/
To reach the hotel from Zaventem airport: The easiest is to take the train in the basement of the airport, and to exit at the **Bruxelles Luxembourg train station** (20 min ride). Then, the hotel is at a 3 min walking distance.

HOTEL DU CONGRÈS has been booked for ESRs of the TRANSMIT consortium.
Rooms have not been prepaid, but will be reimbursed by your PIs on the TRANSMIT convention.
Address: Rue du Congrès 42, 1000 Brussels
Website: https://www.hotelducongres.be/en/index.html
To reach the hotel from Zaventem airport: The easiest is to take the train in the basement of the airport, and to exit at the **Bruxelles Central train station** (18 min ride). Then, the hotel is at a 12 min walking distance.

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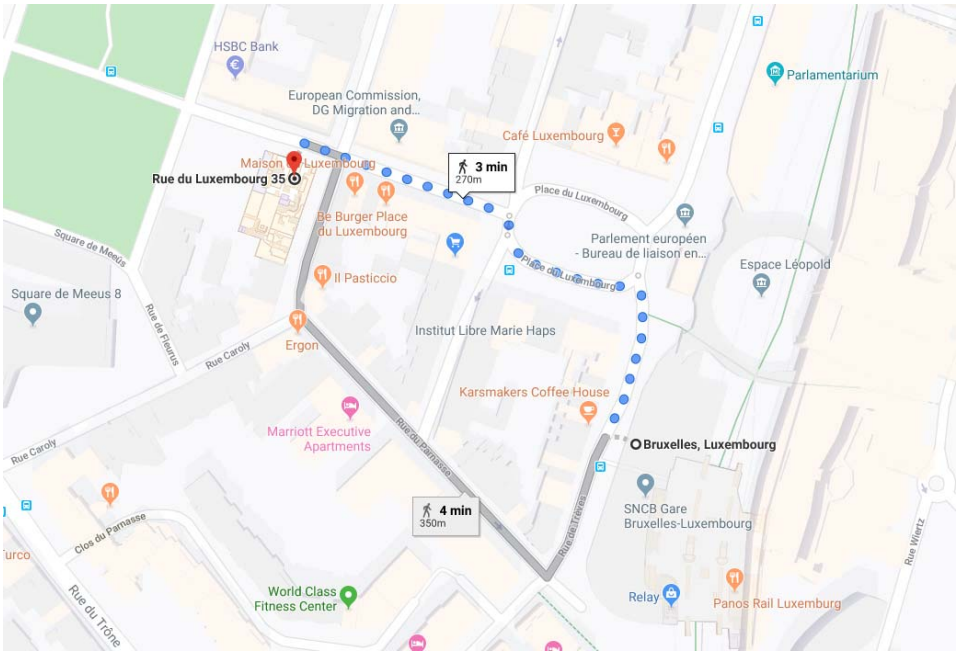
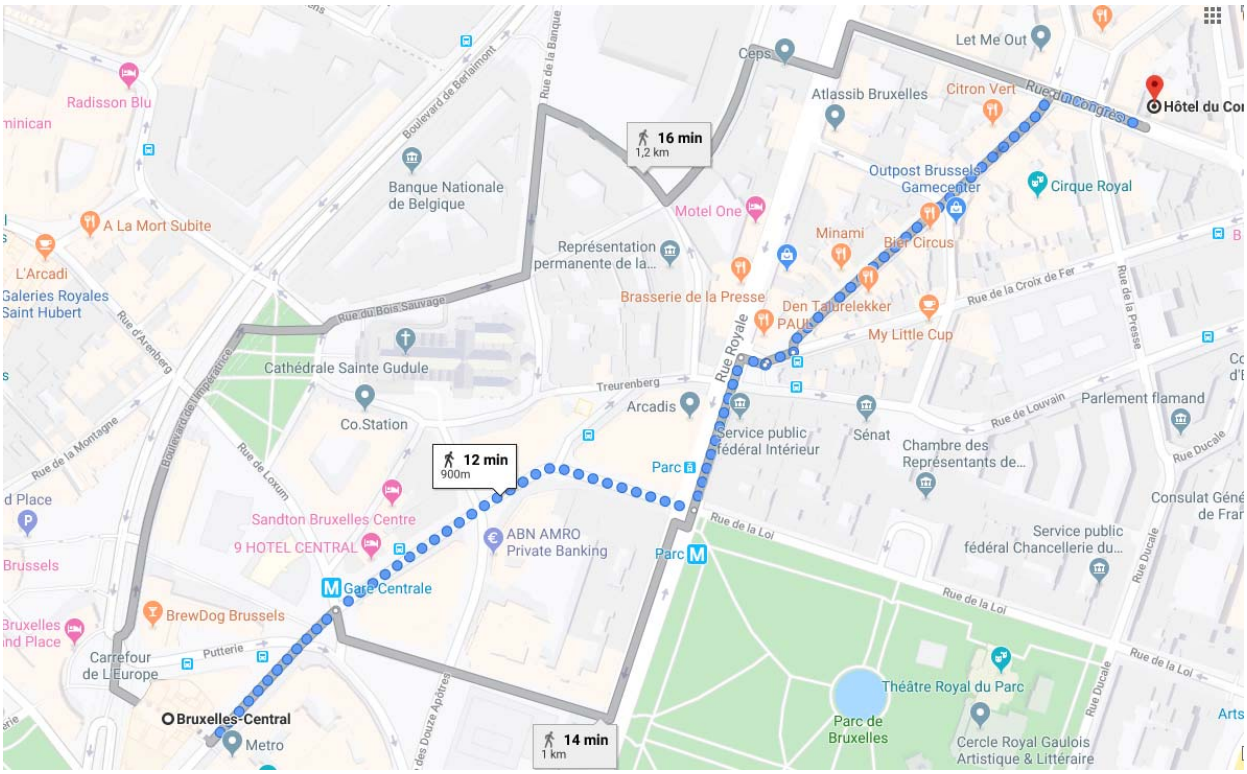
HOTEL LÉOPOLD



HOTEL DU CONGRÈS



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ABSTRACTS

ABSTRACT O1:

IDENTIFYING METABOLIC VULNERABILITIES AND FLEXIBILITIES OF TUMORS

Andrés Méndez-Lucas[1], Peter Kreuzaler[1], Yulia Panina[1], Wei Lin[1], Paul C. Driscoll[1], Nathalie Legrave[1], Adam Taylor[2], Greg McMahon[2], Vincen Wu[3], Avinash Ghanate[1], Paolo Inglese[3], James I. MacRae[1], Ian Gilmore[2], Zoltan Takats[3], Lucy Collinson[1], Josephine Bunch[2] and Mariia Yuneva[1]

[1]The Francis Crick Institute, London, UK. [2]National Physical Laboratory, London, UK
[3]Imperial College London, London, UK

Presenting author: Mariia Yuneva, The Francis Crick Institute, London, UK.
mariia.yuneva@crick.ac.uk

Among the main factors presenting a challenge in designing metabolism-targeting anti-cancer therapies are flexibility of tumor metabolism and tumor heterogeneity. To identify mechanisms involved in tumor resistance when specific metabolic pathways are targeted we have employed mouse models and stable isotope labelling *in vivo*. Using a model of MYC-induced liver tumorigenesis, we demonstrate that tumors engage multiple mechanisms to sustain their metabolic homeostasis. Inhibition of tumor-specific isoforms can be compensated by isoforms expressed in a parental organ. Inhibition of glutamine flux into the Krebs cycle is compensated by increased glucose catabolism and targeting both is required to significantly decrease the levels of the Krebs cycle intermediates and stall tumor formation. Inhibiting serine and fatty acid biosynthesis, processes significantly upregulated during MYC-induced tumorigenesis, are compensated by the uptake of these nutrients from the diet and blood stream. Thus, only combining the inhibition of *Psat1* or *Fasn*, key enzymes in these pathways, with a dietary intervention decreases tumor growth. Finally, our results demonstrate that tumor sensitivity to metabolism-targeting interventions is oncogene-specific. These results demonstrate the extreme flexibility of tumor metabolism and provide a comprehensive view of how the compensatory mechanisms can be targeted as a potent therapeutic tool.

To evaluate the factors contributing to inter- and intra-tumor metabolic heterogeneity we are combining our classical genetic and metabolomics approaches with mass spectrometry imaging (MSI). Using different MSI modalities we can now identify how nutrients are being catabolized in different regions within a tumor. This allows us to understand how genetic and cellular heterogeneity of tumors can determine their response to metabolism-targeting interventions.

This work is funded by the Francis Crick Institute which receives its core funding from Cancer Research UK (FC001223), the UK Medical Research Council (FC001223), and the Wellcome Trust (FC001223) and by the CRUK Grand Challenge Award 2015 C57633/A25043.

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ABSTRACT O2:

SUPPORTING PATIENTS AND THEIR FAMILIES: DYNAMO CAMP AND THE RECREATIONAL THERAPY MODEL

Maria Elena Vivaldi[1]

[1]Dynamo Camp, Limestre & Milan, Italy

Presenting author: Maria Elena Vivaldi, Dynamo Camp, Limestre & Milan, Italy.
mariaelena.vivaldi@dynamocamp.org

Dynamo Camp is the first Recreational Therapy Camp in Italy, open all year long, that offers free holidays to (1) children aged 6 to 17 suffering from serious and chronic diseases in the post hospitalization period and/or in remission phase from treatment, as well as to disabled children (with neurological pathologies, neuromotor disorders and rare syndromes), and (2) parents or brothers/sisters of sick children. Dynamo Camp's mission is to offer these children the opportunity to be able to be "just children" and to their families to enjoy a peaceful holiday and create new relationships with other families that share the same experiences.

Because the diagnosis of a disease affects not only the sick child but also his/her entire family, Dynamo Camp dedicates specific programs to families with sick children and other programs aimed to their brothers and sisters. Dynamo Camp offers four different Recreational Therapy programs:

- *Sessions for Campers only*, children and teenagers with serious and chronic diseases, 8-10 days, 9 sessions in 2019;
- *Siblings sessions,* at the hospitality of brothers and sisters of sick children, 2 for 2019
- *Family Sessions*, the entire family unit, consisting of both weekends and 8to10 day sessions, during school holiday breaks, 9 sessions for 2019;
- *Dynamo Programs,* that bring Recreational Therapy out of the Camp, for children and teenagers who cannot reach the Camp in Tuscany, for reasons related to the pathology or because they live in family houses.

YEAR USERS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CHILDREN IN CAMP	60	218	500	779	844	1,067	1,163	1,199	1,220	1,340	1,311	1,438
PARENTS		40	169	279	292	283	303	370	467	480	508	419
CHILDREN OFF CAMP				start up	970	1,455	1,915	2,400	2,846	3,000	3,600	3,900
VOLUNTEERS	25	78	300	395	500	606	620	630	640	766	848	939
STAFF	16	27	26	37	51	61	54	61	61	62	75	81

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The figures below refers to activities during 2018, the eleventh year of activity:

- 7607 children in programs for Soli Camper;
- 7,269 children, young people and parents in family Programs;
- 20,840 children outside the Camp.

Dynamo Camp is located within a WWF natural oasis, the Oasi Dynamo. It is a mountain area with woods and pastures that covers about 900 hectares among the Appennin, in the municipality of San Marcello Piteglio (PT).

The method. The core of Dynamo Camp program is a wide range of creative, expressive, entertaining and exciting activities. Unlike the daily experience of sick children and adolescents, all Dynamo Camp activities are presented as individual or group challenges based upon the model of Recreation Therapy. In other words, the kids have fun participating to several activities specifically designed to positively influence their self-esteem.

Each participant can choose which pace to proceed and the limit to push him/herself to. Thanks to the support of the group, the absence of competitiveness and the reflection time after the activities, children often find out that they can succeed where they did not think they were able to, focusing on their skills rather than on disabilities. Recreation Therapy is the scientific basis that inspires SeriousFun Camps activities in the world. Children love the fun activities of the Camps and thus they wish to partake.

Recreation therapy means participation - facing challenges, taking risks, making new experiences - that leads to the therapeutic benefits of the Camp program. As recreational experiences focus on discovering new potentials and unexplored territories and on new learning experiences in various forms, the benefits tend to be long-term, often permanent and lead to positive changes in children's attitudes towards themselves and their illness.

Monitoring and Evaluation. At Dynamo Camp, the monitoring of activities and processes has always played an important role, in order to assess the impact of the activities offered and increase their effectiveness. In 2012 and 2014, Yale University conducted a study on a sample of children and young people who participated in the experience of different network camps, including Dynamo. Families completed questionnaires before and after their children's residential stays, helping with their answers to assess level and quality of change. In addition, campers were asked to score the following variables related to resilience, after their stay at the Camp:

- quality of life (significant decrease in the frequency of psychosocial problems);
- disease-related stress and post-traumatic stress disorder (significant decrease);
- modalities that define the process of adaptation to a stressful situation, coping strategies (significant improvement, related to the achievement of certain objectives and adaptability);
- friendship and social support (significant increase in the satisfaction given by friendship);
- happiness (significant increase in happiness with regard to one's health and the ability to do things one likes).

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In addition to these qualitative indicators, 98% of campers said that they had made new friends at the Camp, and 58% of them continued to stay in touch with other campers. Finally, 30% of parents said that the family's social support had increased, thanks to the opportunity to meet other families and interact with them even after the experience at the Camp. Furthermore, among the qualitative impacts that we can certainly consider is the transfer of "soft skills" (skills in Recreational Therapy) from the Dynamo staff to the hospital staff.

During 2015, Dynamo assessed the effectiveness of projects carried out outside the Camp (formerly referred to Outreach) through the SROI methodology. While acknowledging the limits imposed by this type of measurement, the interviews carried out with families met throughout Italy confirmed the quality and validity of the project, allowing us to state that € 1 invested in Recreational Therapy activities, in the form of donation, produces € 2 ,92.

Between 2017 and 2018, Dynamo Camp Association analyzed some qualitative aspects of the Art Factory activity, proposed during 2017, during the summer sessions and some family sessions. A publication was produced that was chosen as a case of excellence by the Social Value Italy Commission, an authoritative Network, to be presented in Rome during the Social Impact Investment event of 12/13 December 2018. Another evaluation has analyzed the impact realized by the pilot project "*Smart Community Camp*", created by the Riccardo Catella Foundation in collaboration with Dynamo Camp and Associazione L'Abilità, which allowed the creation of a Recreational Therapy Camp in Milan and saw the participation of about 50 children with special needs and their healthy peers living in the municipality of Milan.

A further evaluation of the impact of Recreational Therapy sessions applied to children with complex pathologies is underway. This process of evaluating its own projects and activities has allowed Dynamo to specialize its team, and to consider the complexity of the internal organization.

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ABSTRACT O3:

METABOLIC CHANGES DRIVING METASTASIS FORMATION

Sarah-Maria Fendt[1]

[1]VIB-KU Leuven Center for Cancer Biology, Leuven, Belgium

Presenting author: Sarah-Maria Fendt, VIB-KU Leuven Center for Cancer Biology, Leuven, Belgium. sarah-maria.fendt@kuleuven.be

Metastasis formation is the leading cause of death in cancer patients. During metastasis formation, the cancer cell phenotype needs to change. Moreover, cancer cells have access to different nutrients because they are growing in different organs. Since metabolism is the biological process that connects nutrients to the cellular phenotype, it is essential to understand the role of metabolic changes during metastasis formation to inhibit this deadly process. We determined the metabolic state of cancer cells during metastasis formation and defined which cancer cell phenotype is supported by these changes. Consequently, we are inhibiting particular metabolic changes to target the ability of cancer cells to successfully transition through the metastatic cascade. In conclusion, we dissect the metabolic vulnerabilities of cancer cells to inhibit cancer progression towards metastasis formation.

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ABSTRACT O4:

TRANSMIT COMMUNICATION ACTIVITIES: CHILDREN BOOKLET AND BEYOND

Giuseppe De Bonis[1]

[1]Department of Pharmacy and Biotechnology – FaBiT, University of Bologna, Bologna, Italy

Presenting author: Giuseppe De Bonis, Department of Pharmacy and Biotechnology – FaBiT, University of Bologna, Bologna, Italy. giuseppe.debonis2@unibo.it

The talk will tackle the main communication activities carried out thus far by ESRs within the project. Dissemination and outreach are pivotal for Marie Curie projects and represent both an opportunity and an obligation for fellows to communicate their results and their research work far beyond the scientific community. Marie Curie projects like TRANSMIT strongly encourage ESRs to think out of boxes and get out of their ivory tower with the aim of communicating more effectively and to the largest audience possible.

After a brief discussion of the communication activities conducted to reach out to the general public (European Researchers' Night, dissemination in high schools in collaboration with associate partner Fondazione Umberto Veronesi, participation in the Dynamo Camp Open Day), the talk will move on to present the booklet for children defined by the project's fellows. The booklet is meant as a communication tool born in strict conjunction with the Symposium organization and aimed at the same objectives. Finally, the talk will offer an overview of the crowdfunding campaign organized by the TRANSMIT ESRs. The campaign, which is ready to be launched, will benefit four international associations of oncological patients chosen by the project's fellows. The crowdfunding campaign will ideally close the circle started with both the previous communication activities and the training program that ESRs received on soft skills.

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ABSTRACT O5:

THE THERAPEUTIC ALLIANCE AS A WINNING APPROACH AGAINST PEDIATRIC CANCER

Oliva Giada[1]

[1]A.G.E.O.P. Ricerca, Bologna, Italy

Presenting author: Oliva Giada, A.G.E.O.P. Ricerca, Bologna, Italy.
promozione.ageop@aosp.bo.it

Ageop Ricerca is a non-profit association that has been providing care and support to children with cancer and their families since 1982 inside the Oncology Pediatric Department of the S. Orsola-Malpighi Hospital (Bologna).

The association supports patients and their parents through the Welcoming Project (three houses in which they can stay, for free, for the entire period of their treatment), along with psychological support, scientific research, specific and daily assistance and rehabilitation.

In Ageop, the origin of our work is care. Caring is not just an action, but also a state of mind, in which we become considerate and empathetic. The main message is that before taking action, we have to rethink the aims and purposes behind our actions. Are the things we are doing really helpful and beneficial to those in need? In what ways can we raise the quality of life of other people to an optimum level? Everything must be considered from other peoples' perspectives. Our actions are driven by the care in our hearts – taking care of children not only at a medical level, but in every aspect of their lives. Since each child is an independent and unique entity, we want to care for them taking different dimensions into account. What an ill child needs is more than medical care.

With this perspective, it is fundamental to create an alliance between all of the individuals that take part in the care process. In this way, everyone (doctors, nurses, researchers, parents, volunteers, healthcare workers) can understand, through the specificity of a glance, the individual needs of every patient. It is by integrating all of the different perspectives that we can fully respond to the needs of every child giving care the most profound sense of "to take care of in every moment".

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ABSTRACT O6:

GLUCOSE AND AMINO ACID METABOLISM IN CANCER

Jason W. Locasale

Presenting author: Jason W Locasale, Durham, NC, USA. jason.locasale@duke.edu

This presentation will discuss efforts to understand glucose and amino acid metabolism in cancer biology using metabolomics approaches. First, I will discuss new work on our understanding of central carbon metabolism. This part of the talk will focus on efforts to target cancer metabolism by disrupting the processing of macronutrient sources. Several examples of biological consequences of this pathway will then be presented. Next, I will focus on methionine metabolism. I will discuss work on dietary influences on the activity of the pathway and its relation to the regulation of one carbon metabolism in health. How methionine-restricted diets may allow for interventions in cancer treatment will also be discussed. This concept also provides a link between nutrient status and chromatin biology, which I will briefly touch upon.

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ABSTRACT O7:

REGULATING AMINO ACID METABOLISM IN CANCER CAN IMPROVE RESPONSE TO THERAPY

Erez Ayelet[1]

[1]Department of Biological Regulation, Weizmann Institute of Science, Rehovot, Israel

Presenting author: Ayelet Erez, Department of Biological Regulation, Weizmann Institute of Science, Rehovot, Israel. ayelet.erez@weizmann.ac.il

Aberrant expression of urea cycle enzymes occurs in multiple types of cancer. We have previously demonstrated that the urea cycle enzyme ASS1 is downregulated in different tumor types to increase the availability of its substrate aspartate for pyrimidine synthesis, supporting cell proliferation. Therapeutically, we demonstrated that a high pyrimidine to purine ratio improves response to immunotherapy. Interestingly, in several prevalent types of cancer, ASS1 is overexpressed for a yet unknown metabolic benefit that associates with poor patient prognosis. Outside of the liver, ASS1 is essential for the arginine-citrulline cycle, which generates nitric oxide (NO). We thus hypothesized that cancer cells with high ASS1 levels might be arginine/NO-dependent.

We found that ASS1 expression in cancer provides survival advantage in response to glucose deficiency by generating NO required for activating the gluconeogenic enzymes PC and PEPCK *via* S-nitrosylation. The increase in gluconeogenic flux increases serine levels and leads to a nucleotide imbalance promoting pyrimidine to purine transversion mutations. Consequently, cancers with high ASS1 expression are less responsive to immune checkpoint inhibitors independently of mutational load. Reversing the nucleotide imbalance to favor pyrimidines leads to better response to immunotherapy.

Our data firmly establish that, beyond mutational load and tumor heterogeneity, purine/pyrimidine bias is a strong determinant of the response to immunotherapy. Importantly, our findings suggest that we can metabolically manipulate tumor mutations to improve patient response to immunotherapy.

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ABSTRACT O8:

MECHANISMS OF RESPIRATORY CHAIN SUBUNIT EXCHANGES IN COLORECTAL CANCER

Guido Bommer[1]

[1]Université catholique de Louvain, De Duve Institute, Brussels, Belgium

Presenting author: Guido Bommer, Université catholique de Louvain, De Duve Institute, Brussels, Belgium. guido.bommer@uclouvain.be

Intestinal epithelial cells exist in a particularly challenging metabolic situation characterized by large changes in pH, nutrient concentrations and toxins produced by the intestinal microbiota. We found that the functional collaboration of a miRNA and a protein-coding transcript can lead to a subunit exchange in complex IV of the respiratory chain during differentiation of intestinal epithelial cells. This exchange is reverted during colorectal carcinogenesis, suggesting that it may play not only play a role in the physiology of intestinal epithelial cells but also in neoplastic transformation.

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ABSTRACT O9:

AUSTRIAN CHILDHOOD CANCER ORGANIZATION "ONE HEAD, MANY HATS"

Anita Kienesberger[1]

[1]Oesterreichische Kinderkrebshilfe, Vienna, Austria

Presenting author: Anita Kienesberger, Oesterreichische Kinderkrebshilfe, Vienna, Austria.
a.kienesberger@kinderkrebshilfe.at

Around 300 children and adolescents in Austria are diagnosed with cancer every year. Thanks to medical progress, today around 80% of young patients can be cured. But it is not just about survival, it is also about the quality of life after the disease has been survived. Hence, the Austrian Childhood Cancer Organisation (ÖKKH) not only implements several projects for children, adolescents and young adults currently going through therapy and treatment, but also for survivors. Therefore, the organization conducts aftercare camps for children and adolescents affected by cancer as well as for their siblings and parents.

The Austrian Childhood Cancer Organization is a politically independent, non-profit Vienna-based organization primarily financed by private donations. It acts as the association of six local Childhood Cancer Organizations for Vienna/Lower Austria/Burgenland, Tyrol/Vorarlberg, Upper Austria, Carinthia, Styria and Salzburg. While the local organizations' welfare projects mainly focus on supporting families who are confronted with financial difficulties due to a child's illness, the Austrian Childhood Cancer Organization follows the mission to improve the quality of survival in younger cancer patients by specializing in aftercare and long-term follow-up care.

Additionally, the Austrian Childhood Cancer Organization concentrates on launching yearly campaigns seeking in particular to inform and raise awareness of issues concerning childhood cancer and its aftermath. To inform even more people about cancer in children and teenagers the organization moves the Gold Ribbon – the globally unifying symbol in the fight against childhood cancer – to the fore.

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ABSTRACT O10:

INVESTIGATIONS INTO PROLINE SYNTHESIS IN CANCER; THE INFLUENCE OF THE TUMOR MICROENVIRONMENT AND ENDOGENOUS REDOX

RL Westbrook,[1,2] L Vettore,[1,2] KE Hollinshead,[1,2,3] Daniel Tennant[1]

[1]Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, UK. [2]These authors contributed equally to this work. [3]Current address: Perlmutter Cancer Center, NYU Langone Medical Center, New York, 10016, USA.

Presenting author: Daniel Tennant, Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, B45 8NR, UK. d.tennant@bham.ac.uk

Proline is a non-essential amino acid required for beta turns within the structure of proteins, and making up just over 6% of all proteins in the human proteome. However, in some specific proteins – such as collagen – it makes up a much higher proportion (~17%). In addition to being required for normal protein synthesis, proline has other roles – in particular as an osmolyte, and an electron donor to the electron transport chain (ETC). It has been shown that in some conditions exogenous proline can be taken up and used to generate ATP, while in others, endogenously generated proline is excreted as a means of normalizing mitochondrial redox balance.

Three enzymes synthesize proline through the reduction of pyrroline 5-carboxylate (P5C) in mammalian cells; P5C reductase 1, 2 and 3 or L (PYCR1, 2 and 3/L). Although all utilize the reducing potential of NAD(P)H for their activities, while PYCR1 and 2 are mitochondrial, PYCR3 is thought to be cytosolic, and therefore subject to entirely different levels of regulation by the environmental redox balance. Their roles and the precise nature of their control are largely undescribed.

Our investigations suggest that PYCR1 is responsive to conditions where mitochondrial NADH:NAD^+ balance is shifted, whether due to genetic mutation or microenvironmental stimulus. We show that both mutations in isocitrate dehydrogenase 1 (IDH1), which alters mitochondrial redox homeostasis, and hypoxia, which increases matrix NADH:NAD^+ ratio, increase proline synthesis from glutamate through PYCR1. Reduced expression of PYCR1 alters the way in which mitochondria can respond to these conditions, increasing oxygen consumption or decreasing the rate of oxidative TCA cycle activity. PYCR2 and 3 appear to be responsible for other aspects of cellular redox balance and proline synthesis, the latter providing a link between redox balance and the urea cycle as it incorporates carbons from ornithine into proline, rather than glutamate. Although both enzymes do not upregulate proline synthesis in response to hypoxia, their activity appears to be important in response to other microenvironmental situations, such as oxidative stress.

It is therefore becoming clearer that the multiple isozymes of PYCR in mammalian cells have differential functions based on their location and pyridine nucleotide substrate specificity. Ongoing research in our and other research groups are continuing to uncover these functions, as they are likely to play an important regulatory role in health and disease.

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ABSTRACT O11:

IN VIVO AND IN VITRO MODELS, WHY DO WE NEED THEM?

Oliver Maddocks[1]

[1]Wolfson Wohl Cancer Research Centre, Institute of Cancer Sciences, University of Glasgow, Glasgow, UK

Presenting author: Oliver Maddocks, University of Glasgow, Glasgow, UK.
oliver.maddocks@glasgow.ac.uk

Cancer cells acquire a range of metabolic adaptations that facilitate tumor growth. Up-regulation of anabolic pathways and pathways that protect from potentially damaging stresses – such as reactive oxygen species – are commonly displayed by cancer cells. While these adaptations can promote growth and cell survival, they can also decrease metabolic flexibility and impose increased demands for nutrients that are metabolic precursors for activated pathways. A major group of nutrients within this category are amino acids. Whereas 'essential' amino acids must be obtained from the diet, 'non-essential' amino acids can be dietary or synthesized *de novo* from other nutrients, such as glucose or essential amino acids. The non-essential amino acids are known to be particularly important for cancer cell metabolism as they support the synthesis of nucleotides (used in DNA and RNA), the cellular anti-oxidant glutathione, proteins, and numerous other cellular components. By limiting the availability of exogenous amino acids it possible to limit the growth of some tumors *in vivo*, however, other tumors resist amino acid restriction. By understanding which amino acids are truly essential and non-essential to cancer cells, and which genetic changes that drive these essentialities, we will be better placed to develop targeted metabolic interventions to combat cancer.

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ABSTRACT O12:

I´M STILL STANDING

Izabela Grape[1]

[1]Breast Cancer Society Amazona, Stockholm, Sweden

Presenting author: Izabela Grape, Bröstcancerföreningen Amazona, Stockholm, Sweden.
izabela@amazona.se

Twenty-one women in Sweden are diagnosed with breast cancer every day. Many of the women recover without any side effects and get back to their ordinary life. Unfortunately, there is a large number of women that struggle. The Breast Cancer Society Amazona in Stockholm is an organization consisting of members who are diagnosed with breast cancer and others who are related to diagnosed persons.

One of the guidelines is the promise to our members that no one should have to be alone with their breast cancer. The Breast Cancer Society Amazona gives support and information to its members. We talk and inform about side effects of the treatments, help women to process the experiences and help understanding the circumstances. We arrange a variety of activities for our members. Many of the activities take place in collaboration with healthcare professionals, such as medical specialists giving lectures on different aspects related to breast cancer. We also arrange several social and rehabilitation activities, such as discussion groups, retreats, water gymnastics, yoga, painting therapy, city walks, etc.

The other part of our work is to influence the health professionals to take care of their patients with the best-known treatments while they also treat the individual with dignity and care.

We publish a magazine with 4 issues per year that addresses what happens in the association, refers lectures and addresses various aspects of cancer care. We are trying to stay updated on the newest research.

The work of the association is based on non-profit work from the officials in the association. Our work is funded through member fees and grants from various organizations that support a specific activity. The number of activities we can arrange is fully dependent on what funding we can get.

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ABSTRACT O13:

TARGETING METABOLIC VULNERABILITIES WITH AN OXPHOS INHIBITOR

Joseph R. Marszalek[1]

[1]The University of Texas MD Anderson Cancer Center, Houston, TX, USA

Presenting author: Joseph R. Marszalek, The University of Texas MD Anderson Cancer Center, Houston, TX, USA. JRMarszalek@mdanderson.org

Since the observations of Otto Warburg in 1929, metabolic reprograming has been appreciated as a hallmark of cancer biology. Over the past decade, therapeutic development has been actively pursued with the hope of expanding the armamentarium of oncology drugs. Since the initial insights of Warburg, the field has focused on therapeutic targeting of glycolysis. However, drugging the complementary metabolic process, mitochondrial oxidative phosphorylation (OXPHOS), has remained largely unexplored, partly due to concerns about a limited therapeutic window and an incomplete understanding of tumor contexts in which OXPHOS is essential. In order to test this concept and determine whether a therapeutic window exists in the clinic, we executed an extensive drug discovery effort that culminated in the identification, characterization and development of IACS-010759, a clinical-grade small-molecule inhibitor of mitochondrial complex I of the electron transport chain. Through a series of preclinical studies, we established that glycolysis-deficient models of brain cancer and most models of acute myeloid leukemia (AML) are reliant on OXPHOS, likely owing to a combination of energy depletion and reduced aspartate production that leads to impaired nucleotide biosynthesis. In models of brain cancer and AML, tumor growth was potently inhibited *in vivo* following IACS-010759 treatment at well-tolerated doses, with reduction in proliferation and induction of apoptosis observed. As part of our preclinical development, we developed biology informed biomarker assays that we successfully incorporated into our clinical development strategy. IACS-010759 is currently being evaluated in phase I clinical trials in relapsed/refractory AML and solid tumors, which are providing biological and clinical insights into the potential of OXPHOS inhibitors as therapeutic options for cancer patients.

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ABSTRACT O14:

CANCER AS A MITOCHONDRIAL METABOLIC DISEASE: IMPLICATIONS FOR NOVEL THERAPEUTICS

Purna Mukherjee[1]

[1]Biology Department, Boston College, MD, USA

Presenting author: Purna Mukherjee, Biology Department, Boston College, MD, USA.
purna.mukherjee@bc.edu

Cancer is a mitochondrial metabolic disease involving disturbances in energy production through respiration. The mutations observed in tumor cells and all other recognized hallmarks of cancer are considered downstream epiphenomena of the initial disturbance of cellular energy metabolism. The disturbances in tumor cell energy metabolism can be linked to abnormalities in the structure and function of the mitochondria. As a result of damaged respiration, cancer cells upregulate fermentation processes and thus completely dependent on fermentable metabolites, glucose and glutamine. Therefore, cancer growth and progression can be managed following a whole-body transition from fermentable metabolites, primarily glucose and glutamine, to respiratory metabolites, primarily ketone bodies. Calorie-restricted ketogenic diets can lower circulating glucose and elevate ketone bodies. The metabolic transition from glucose to ketone bodies will not only keep the normal cells healthy, but also reduce tumor angiogenesis and inflammation while enhancing tumor cell apoptosis. Malignant brain cancer in preclinical models and in humans will be used to illustrate general concepts. New information will be presented on glutamine targeting, the Glucose/Ketone Index (GKI), and the Press-Pulse therapeutic strategy for non-toxic cancer management and prevention. It is anticipated that metabolic therapies targeting glucose and glutamine, while increasing therapeutic ketosis, will significantly improve quality of life and overall survival for most cancer patients.

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ABSTRACT O15:

VHL UK/IRELAND CHARITY IS A RESEARCH TEAM PLAYER

Graham Lovitt[1,2]

[1]VHL charity, UK/Ireland
[2]HLRCC Family Alliance, Boston, MA, USA

Presenting author: Graham Lovitt, von Hippel-Lindau Syndrome (VHL) charity, Retford Notts. *UK. gjlovitt@vhl-uk-ireland.org*

The VHL UK/Ireland Charity was formed in 2013with the help of the VHL Alliance following the demise of a previous charity von Hippel-Lindau Group (1990 – 2012). The new charity widened its area to cover the whole of the United Kingdom and the Republic of Ireland, and the conditions supported to be VHL, BHD and HLRCC. It has appointed 10 trustees and is registered as a charity both with the England and Wales Charity Commission and the Ireland Charities Regulator.

The Charity's objectives are

- Patient Support (but not financial as control is difficult for a small organization)
- Raise Awareness
- Raise Funds via fundraising and donations for Research

Patient Support and Raising Awareness. The charity has a website, online merchandise shop and social media accounts on Facebook, Twitter etc. It has distributed copies of the VHL Alliance Handbook to patients and to all the UK and Ireland Genetic Centres. It has arranged Information and Annual Patient Support Day Meetings in London, Manchester, Glasgow, Sheffield, Cambridge and Dublin.

Fundraising. Individuals and Groups have raised over £100,000 since the Charity was formed. There has been a succession of Charity Balls that have raised £35,000 in total and were for the joint equal benefit of two charities (usually one large charity such as Macmillan or Alzheimer's Society and ourselves). The largest single fundraiser for £10,000 was a climb-up the Ben Nevis Mountain by 28 people.

Research Donations and Grant Awards. Two donations of £5,000 each were made to Cambridge University for pieces of laboratory equipment. Two Grant awards of £40,000 each were made Cambridge University for Projects - "UK Registry for VHL disease and other Inherited kidney tumor syndromes" and "genomes project VHL study". The new registry has been accepted to become part of the well-established National Registry of Rare Kidney Diseases (RaDaR) initiative
Analysis of the genetic alterations in VHL and other kidney genes in order to better classify the genetic variations in these genes. Smaller donations have been made to VHL Alliance; to support young people attending VHL Europa Events in Berlin and Florence and for a VHL Alliance Wellbeing Coaching On-Line Course.

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ABSTRACT O16:

REPRODUCIBILITY AND TRANSPARENCY IN SCIENTIFIC PUBLISHING

Ana Mateus[1]

[1]Nature Cell Biology, Nature Research, London, UK

Presenting author: Ana Mateus, Nature Cell Biology, Nature Research, London, UK.
ana.mateus@nature.com

Scientific advances result from contributions from several researchers and are built on previous studies. Therefore, it is of paramount importance that published data can be reproduced by other scientists. To ensure this we have implemented several checks to improve the methodology and statistical analyses description. In addition, we now demand source data for numerical and statistical data as well as deposition of large datasets in repositories. Moreover, we are heading towards a more transparent approach to scientific publishing, where decision letters and referee reports are published together with the manuscript. Importantly, publication of scientific studies in open access platforms improves their dissemination and scientific advances. In this talk, I will discuss these different aspects of scientific publishing.

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P2	BASTOS SANT'ANNA SILVA, Ana Carolina	MITOs function in prostate cancer mediated by nutrient utilization
P3	BEZUIDENHOUT, Nicole	The role of mitochondria in ovarian cancer
P4	DA SILVA ALMEIDA, Ana Catarina	Cancer cell models to test medicines that affect Metabolism
P5	DI PAOLA, Floriana Jessica	How do cancer cells produce energy?
P6	MAHESHWOR, Thapa	Measuring the amounts of coenzymes in cancer cells
P7	SARLAK, Saharnaz	MITOs, cigarette smoke and lung diseases
P8	SCHMIDT, Christina	Understanding how loss of the enzyme fumarate hydratase causes cancer
P9	UMESH GANESH, Nikkitha	How does MITO damage affect the cells surrounding the cancer?
P10	WEBER, Daniela	Impact of diet on cancer growth
P11	ZAMPIERI, Luca	Altered MITOs may make cancer cells resistant to medicines

BIOGRAPHIES OF TRANSMIT ESRS

ABLA, Houda
Department of Pharmacy and Biotechnology – FaBiT
University of Bologna, Bologna, Italy

I am Houda Abla, an Algerian pharmacist. Ever since I was young, I have always wanted to be a researcher and to make new discoveries able to advance my field of research. I first studied Pharmacy in Algeria, and then enrolled in a Master's degree in "Medicinal chemistry and pharmacological innovation" in France. I am currently a PhD student at the University of Bologna, Department of Pharmacy and Biotechnology (FaBiT) under the supervision of Prof. Anna Maria Porcelli. The focus of my research project is on the role of mitochondria in cancer initiation and progression and as a target to develop novel anticancer therapies. Being part of the TRANSMIT consortium is a priceless experience for me: I can work with professionals, learn from their expertise as to acquire skills, and meet new people. I think that, together, we can improve our understanding of cancer pathology.

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BASTOS SANT'ANNA SILVA, Ana Carolina
Oroboros Instruments, Innsbruck, Austria

I have always been fascinated by life sciences. Since I was a child, I have been interested in learning and trying to understand the world surrounding me. I got my Bachelor's degree in Biology and Genetics from one of the best universities in Brazil, the Federal University of Rio de Janeiro. Since then, I felt challenged by the study of cancer cells and their adaptations to survive and proliferate. Subsequently, I completed my Master's degree at the same university, in the Laboratory of Biochemistry and Molecular Biology of Cancer. In October 2017, I enrolled for the PhD program at the Medical University of Innsbruck within a TRANSMIT PhD fellowship, being part of Oroboros instruments, supervised by Prof. Erich Gnaiger. The main objective of my project is to identify mitochondrial metabolic biomarkers for characterizing the transformation from benign to cancer cells.

BEZUIDENHOUT, Nicole
Department of Oncology-Pathology
Cancer Center Karolinska, Karolinska institute, Stockholm, Sweden

I am a physiologist by profession, who attended Stellenbosch University, South Africa, where I completed my BSc (Functional Human Life Sciences) and MSc (Medical Physiology) degrees. I subsequently spent some years in industry and academia, gathering knowledge and experience in cellular and mitochondrial physiology and pathophysiology. Currently, I am a PhD student under the supervision of Prof. Maria Shoshan, at the Karolinska Institute in Stockholm, and co-supervision of Prof. Giuseppe Gasparre at the University of Bologna. My project, as part of the TRANSMIT network, focuses on the role of mitochondria in ovarian cancer development and chemoresistance. I am grateful for the opportunity to be part of the TRANSMIT consortium, and look forward to learning from and exchanging knowledge and ideas with experts and fellow ESRs, in addition to growing as a researcher both technically and professionally.

DA SILVA ALMEIDA, Ana Catarina
AvantiCell Science Ltd, Auchincruive, UK

My name is Catarina and I was born in Portugal. I received my first Bachelor's degree in Neurophysiology and started working in a private practice as a Neurophysiology technician. My job involved performing medical exams to patients with various types of disorders. It was a very interesting job, which gave me the opportunity to work face-to-face with patients. Despite contributing to diagnostics, I felt that I needed to go deeper into the understanding and treatment of those disorders. I therefore

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decided to take a Bachelor in Biotechnology, and my interest in Science and Research began. Some years later, after completing my Master in Biopharmaceutical Sciences, I enrolled in a PhD program with the TRANSMIT network. I am currently conducting my research at AvantiCell Science in Scotland, where I work with cancer cell models to test metabolic intervention strategies. My supervisor at ACS is Dr. Colin Wilde. My co-supervisor at UNIBO is Prof. Anna Maria Porcelli.

DI PAOLA, Floriana Jessica
Faculty of Veterinary Medicine
Justus Liebig University of Giessen, Giessen, Germany

My name is Floriana Jessica Di Paola. I am 27 years old and I am a molecular and cellular biologist. I studied Biology at the University of Catania (Italy) and, in March 2017, I got my Master's degree from the University of Bologna (Italy). During my internship in the Laboratory of Cell Biochemistry at Bologna University, I realized that my passion for biological research was motivated by the constant challenge of learning something new and finding solutions to arising problems. Right now, I am a PhD student at the Justus Liebig University of Giessen (Germany), within the TRANSMIT project, under the supervision of Prof. Sybille Mazurek. My research project focuses on the metabolic reprogramming of cancer cells, with particular interest in the coordination of glutaminolysis and glycolysis.

MAHESHWOR, Thapa
Biocrates Life Sciences AG, Innsbruck, Austria

I am Maheshwor Thapa from Nepal. I did my Bachelor's degree in Pharmacy, Nepal. Since then, I developed a keen interest in pharmaceutical research. Further, I got a chance to do my Master's degree in South Korea with major in Medication and Analytical Pharmacy. Research works during my Master's study inculcated me with various skills for bioanalytical method development, and encouraged me to move forward in the field of biomedical research. This eagerness towards research led me to be a part of TRANSMIT network. Within this Consortium, I am currently a PhD student at Paracelsus Medical University under the supervision of Prof. Barbara Kofler and Dr. Guido Dallmann. My focus is to develop a simple and sensitive analytical method for the quantification of coenzymes in various cancer cells using LC-MS/MS.

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SARLAK, Saharnaz
INSERM U1211 Rare Diseases, Genetics and Metabolism
University of Bordeaux - CHU Pellegrin, Bordeaux, France

My name is Saharnaz Sarlak. I am from Iran and I completed my BSc in Cellular and Molecular Biology at the Ferdowsi University of Mashhad, Iran. Later, I joined a Master's program in Molecular Medicine at the Norwegian University of Science and Technology in Trondheim, Norway. For my Master's thesis, I chose my specialization in the field of cancer research, and this led me to continue my career in this area. After my graduation, I went back to my country and continued my research there for two years. In November 2017, I started my PhD in 'Cancer bioenergetics in lung tumors' at the University of Bordeaux, France, under the supervision of Dr. Rodrigue Rossignol. This PhD program is part of the TRANSMIT project, a European network specialized in Mitochondrial Biology.

SCHMIDT, Christina
Hutchison/MRC Research Centre
University of Cambridge, Cambridge, UK

My name is Christina Schmidt and I am a biochemist from Germany. Studying biochemistry at the Julius-Maximilians University of Würzburg (Germany) has given me great opportunities and a solid knowledge foundation in the field of biochemical sciences. During my Master's degree, I spent one year at the University of Oulu (Finland) under the Erasmus program. This time not only faced me with darkness and freezing temperatures, but also with interesting practical experiences. Ever since I started studying cancer biology, my perspective has changed and my fascination about cancer science arose: I was particularly intrigued by the complexity of metabolic pathways. As I have always been searching for intellectual exchange of ideas, knowledge and methods, I was happy to find such a great platform to further pursue my interests in my PhD within the TRANSMIT network. I am currently working in the laboratory of Dr. Christian Frezza at the University of Cambridge (UK). My project focuses on understanding the role of the mitochondrial enzyme fumarate hydratase in tumorigenesis.

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UMESH GANESH, Nikkitha
Department of Medical and Surgical Sciences – DIMEC
Medical Genetics Unit
University of Bologna, Bologna, Italy

I am Nikkitha Umesh Ganesh from India. My inspiration to pursue Biological Sciences comes from my father, a veterinarian, who exposed me to the research filed. I did my Bachelor's degree in Biotechnology, India, after which I completed my Master's degree in Cancer Cell and Molecular Biology, UK. I am currently enrolled in a PhD program at the University of Bologna, Department of Medical Sciences and Surgical Sciences (DIMEC) with a TRANSMIT PhD fellowship under the supervision of Prof. Giuseppe Gasparre. The TRANSMIT project provides me with an ideal intersection between academic research and industrial applications as to develop my scientific skills in the field of cancer research. My research topic focuses on mitochondrial complex 1-driven regulation of the hypoxic response of cancer cells.

WEBER, Daniela
Department of Pediatrics
Paracelsus Medical University, Salzburg, Austria

My name is Daniela Weber and I come from Germany. Fascinated by human biology and physiology, I studied Nutrition Science and Biomedicine at the Technical University of Munich. During my Master's studies, I increasingly focused on mitochondrial biology and the essential role of mitochondria in energy metabolism. In October 2017, I started my PhD within the TRANSMIT project in the Lab of Prof. Barbara Kofler at the Paracelsus Medical University, Salzburg. The aim of my research project is to investigate the impact of ketogenic diet - a high fat/low carbohydrate/adequate protein-diet - on tumor progression and its potential use as adjuvant cancer therapy. Most cancer cells thrive on glucose as major energy source and partly possess dysfunctional mitochondria leading to a reduced ability to metabolize fat. Thus, providing patients with a diet high in fat but low carbohydrates may reduce tumor growth and prolong survival.

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ZAMPIERI, Luca
IREC Pole of Pharmacology
Université catholique de Louvain (UCLouvain), Brussels, Belgium

I am Luca Zampieri and I am Italian. I obtained a Master's degree in 'Chemistry and Pharmaceutical Technologies' from the University of Padova. Since I was in high school, my studies have always been oriented to science: I chose my Master's program driven by the complexity of human biology and, finally, I focused my study plan on 'Science and Development of Drugs', with the aim of starting a career as a researcher. I am currently a PhD student at the Université catholique de Louvain, Belgium, under the supervision of Prof. Pierre Sonveaux. My research project, within the TRANSMIT network, aims to discover a way to overcome cisplatin resistance in ovarian cancer with a focus on the metabolic alterations associated to this resistance. Being part of the TRANSMIT consortium allows me to further increase my knowledge about cancer and to acquire new useful skills for my future as a researcher.

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