



Perseus is funded by the European Union's Horizon Europe research and innovation programme under Grant Agreement no. 101099423.
UK participants in Horizon Europe Project Perseus are supported by UKRI grant number 10073017.

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PERSEUS

PERSEUS International Workshop
Cancer nanomedicine: forging a path to the clinic
Friday 29 May 2026

Opening Session

09:00 — 09:10

Welcome and Greetings, **Andrea Zappettini**, Director of CNR-IMEM.

09:10 — 09:30

Introduction, **Giancarlo Salviati** **PERSEUS project Coordinator**, National Research Council-Institute of Materials for Electronics and Magnetism (CNR-IMEM), Parma, Italy.

Session I

Morning- Session Chair:

Jeny Shklover, Technion-Israel Institute of Technology, Haifa, Israel.

09:30 — 09:55

Invited **Elias S.J. Arnér**, Selenoproteins and reductive enzyme pathways in control of cell fate and as anticancer drug targets. Karolinska Institutet, Stockholm, Sweden; National Institute of Oncology, Budapest, Hungary.

09:55 — 10:10

Stefania Garbujo, Nature-inspired nanovesicles enable RNA delivery to the breast cancer microenvironment. University of Milano-Bicocca, Milan, Italy.

10:10 — 10:35

Invited **Francesco Bonaccorso**, Industrial production of 2D materials: safety rules for scale up and standardisation. BeDimensional SpA, Genova, Italy.

10:35 — 11:00

Invited **Miriam Colombo**, Cutting-edge biofunctionalized nanoparticles: a step toward technological innovation. University of Milano-Bicocca, Milan, Italy.

11:00 — 11:15 Coffee Break.

Session II

Morning-Session Chair:

Evie L. Papadopoulos, BeDimensional SpA, Genova, Italy.

11:15 — 11:40

Invited **Alessandro Bertucci**, Fragility as a design principle in silica nanoparticles for nanomedicine. University of Parma, Parma, Italy.

11:40 — 11:55

Luca Capelli CRISPR-Cas detection of protein biomarkers powered by DNA nanotechnology. University of Parma, Parma, Italy.

11:55 — 12:10

Elena Ferrari, Radiation-induced cell damage enhanced by high-Z nanomaterials at low X-ray dose. National Research Council-Institute of Materials for Electronics and Magnetism, Parma, Italy.

12:10 — 12:25

Marco Bormetti, Synthesis of novel multicomponent hybrid nanosystems for cancer treatment under low energy X-ray irradiation. University of Parma, Parma, Italy.

12:25 — 12:40

Gloria Cenci, Multicomponent nanosystem activated by low-dose irradiation in human cancer cells in 2D monolayers and 3D spheroids models. University of Parma, Parma, Italy; National Research Council-Institute of Materials for Electronics and Magnetism (CNR-IMEM), Parma, Italy.

12:40 — 13:40

Lunch Break.

Session III

Afternoon-Session Chair:

Francesca Rossi, National Research Council-Institute of Materials for Electronics and Magnetism (CNR-IMEM), Parma, Italy.

13:40 — 14:05

Invited **María C. Rodríguez-Argüelles**, Using nature to battle cancer. Universidad de Vigo, Vigo, Spain.

14:05 — 14:20

Melissa Santi, Synthesis of metal nanoparticles by naturally-derived compounds for photodynamic therapy applications. National Research Council-Institute of biophysics (CNR-IBF), Pisa, Italy.

14:20 — 14:45

Invited **Måns Broekgaarden**, Lipid nanoformulations for photodynamic-and radiotherapy for pancreatic cancer. Grenoble-Alpes University, Grenoble, France.

14:45 — 15:10

Invited **Bengt Fadeel**, Graphene and other advanced materials: focus on inflammation. Karolinska Institutet, Stockholm, Sweden.

15:10 — 15:25

Pragati More, Biological impact of multicomponent nanosystems using primary human macrophages: evidence for biotransformation in living cells. Karolinska Institutet, Stockholm, Sweden.

15:25 — 15:40

Coffee Break.

Session IV

Afternoon-Session Chair:

Giancarlo Salviati, National Research Council- Institute of Materials for Electronics and Magnetism (CNR-IMEM), Parma, Italy.

15:40 — 16:05

Invited **Salem Billan**, The evolution of radiation therapy: where we stand now. The Joseph Fishman Oncology Centre, Rambam Health Care Campus, Haifa; Technion-Israel Institute of Technology, Haifa, Israel.

16:05 — 16:20

Jakab Árpád, Optimal X-ray source peak voltage for treatment of tungsten disulfide based hybrid nanoparticle sensitized mouse tumour. HUN-REN Wigner Research Centre for Physics, Budapest, Hungary.

16:20 — 16:35

Invited **Dávid Beke**, X-Ray-Triggered Luminescence in transition metal-doped spinel nanocrystals: toward precision nanomedicine applications. HUN-REN Wigner Research Centre for Physics, Budapest, Hungary.

16:35 — 16:50

Yasmin Habib, Multi-Functional 2D Nano-Systems for Precision Oncotherapy Triggered by Low Energy X-Rays. Technion-Israel Institute of Technology, Haifa, Israel.

16:50 — 17:05

Xu Jing, Strategies for high-efficiency low-dose radiotherapy for tumour treatment via novel nanomaterial-mediated radiosensitization. Karolinska Institutet, Stockholm, Sweden.

17:05 — 17:30

Invited **Avi Schroeder**, Targeted nanoparticles for treating Parkinson's disease. Technion-Israel Institute of Technology, Haifa, Israel.

17:30 — 17:55

Invited **János Szebeni**, Unique Features and Collateral Adverse Effects of mRNA-LNP Nanoparticles: Focus on COVID-19 Vaccines and Cancer. Semmelweis University, Budapest, Hungary.

Final Session

18:00 — 18:30

Final discussion and wrap-up.

20:00 — 22:00

Social dinner at Santa Teresa Restaurant.

PERSEUS
International Workshop
Friday 29 May 2026

Parco Area delle Scienze, 37/A
43124 Parma
Italy


Consiglio Nazionale
delle Ricerche

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Karolinska
Institutet


TECHNION
Israel Institute
of Technology


WIGNER



BE DIMENSIONAL





The international workshop Cancer Nanomedicine: Forging a Path to the Clinic aims to provide a focused forum for discussing recent advances in nanotechnology-based cancer therapies. The event brings together researchers, clinicians and experts in nanomedicine and drug delivery to exchange knowledge, present emerging results, and examine the scientific and technological gaps that still limit clinical translation. In addition to invited talks, the workshop creates a dedicated space for open discussion and idea-sharing on emerging approaches in the field. Opportunities for young researchers to present their work will further enrich the scientific exchange. By prioritizing direct scientific conversation, the workshop enables participants to explore new findings, discuss challenges, and identify promising directions for advancing nanomedicine toward clinical application.



About the Perseus project

The PERSEUS project, funded by the European Innovation Council, aims to develop a novel cancer therapy using nanotechnology for deep-seated, drug-resistant and metastatic tumours. The therapy involves multifunctional composite nanosystems made from 2D transition metal dichalcogenide (TMD) flakes, metal nanoparticles and photosensitizers, encapsulated in liposomes. These nanosystems absorb low energy X-ray radiation, which can be activated by CT scanners. Upon activation, they convert the absorbed energy into reactive oxygen species and radiosensitizing agents, providing multimodal therapy with minimal adverse effects. This therapy can reach tumours inaccessible by other radiation types and is effective regardless of cancer type or patient gender. The approach does not deliver specific drugs for a particular type of tumor (like e.g. chemotherapy), rather it excites material-mediated physico-chemical processes through targeting, irradiation and immunotherapy. Therefore, the therapy is agnostic to the type of cancer and to gender incidence because it does not affect the body biochemistry. Further, low energy X-ray irradiation can also induce immunogenic cell death with the exposure or release of neo-antigens to trigger an anti-cancer immune response (abscopal effect), to treat metastatic disease.

Perseus at a glance

Project title:
2D Material-Based Multiple Oncotherapy Against Metastatic Disease Using a Radically New Computed Tomography Approach

Acronym:
PERSEUS

Funding:
European Innovation Council (EIC), SMEs Executive Agency, UK Research and Innovation

Coordinator:
Dr. Giancarlo Salvati (National Council of Research–Italy)

Project duration:
1 March 2023–28 February 2027

Consortium:
National Research Council, CNR–Italy (Coordinator)
Karolinska Institutet–Sweden
Israel Institute of Technology, Technion–Israel
Universidad de Vigo–Spain
Wigner Fizikai Kutatóközpont–Hungary
BeDimensional S.P.A–Italy
QED Film & Stage Productions LTD (Associated Partner)–UK