Life sciences made in Tuscany

Innovating for Saving, Empowering, and Connecting Lives

July 17 and 18, 2025

Osaka, Expo
Italy Pavilion

At Expo Osaka 2025, T-POWER will feature a permanent video installation illustrating how the Tuscan model concretely addresses the three priorities of the World Expo:

Saving Lives
Innovation in precision diagnostics and personalized medicine

Empowering Lives
Robotic technologies and assistive solutions

Connecting Lives
Projects for social well-being and inclusion

Visitors will be able to explore innovative prototypes resulting from interdisciplinary research in Tuscany, and take part in workshops and thematic forum focused on technology transfer and research, clinical practice, and industry collaboration.

T-POWER aims to serve as a global connection hub, promoting shared solutions to future healthcare challenges, in alignment with the United Nations Sustainable Development Goals (SDG 3, 9, 17).

A bridge between science, culture, and beauty, in the spirit of Tuscan tradition.

Life Sciences and Technologies Made in Tuscany 9 am - 1 pm

July 17 and 18

DEMOS

AR & patient-specific phantoms for surgery
University of Pisa

The demos showcase AR-guided placement of patient-specific templates in bone resections and a knee arthroplasty simulator with 3D-printed bones, offering hands-on experience and insights into advanced tools for accurate surgery and training.

3D innovation for tailored medical care
University of Florence

The demo includes pediatric simulators for intubation, tracheotomy, and thoracoscopy, made with realistic 3D-printed materials. It also features a rehab device for hand/arm recovery using serious games, pneumatics, and sensors for tailored, monitored exercises.

Tactile technologies for augmented perception
University of Siena

The haptic totem enhances digital content with touch, syncing vibrations and temperature cues to audio-video experiences. By placing your hand on the plate, you'll feel textures and heat changes timed to on-screen content, creating a fully immersive experience.

Tactile sensing for biomedical applications
Sant'Anna School of Advanced Studies

An anthropomorphic robotic arm with artificial skin and fiber optic sensors detects touch type and location via a bioinspired algorithm. Visitors can interact with it and see real-time feedback, showcasing safe human-robot interaction through advanced tactile sensing.

DANTE: hand exoskeleton for assistance and rehabilitation
University of Florence

DANTE supports patients with movement difficulties through an intuitive, adaptable system. The live demo lets you see it in action, test hand interaction, and learn its benefits for robot-assisted therapy, showcasing its potential to improve quality of life.

Human-Robot interaction for brain health
University of Florence

The demonstrator combines a humanoid robot, wearable sensors, and smart objects in a system for diagnosing and rehabilitating neuro disorders. It engages patients, tracking expressions, emotions, and motor skills to personalize rehab and identify new biomarkers through robotics and smart sensing.

Saving, Empowering, Connecting Lives 2 pm - 6 pm

Health and culture of well-being in Tuscany: Tuscany Health Ecosystem (THE) project

July 17

2 pm - 2:30 pm
Video **T-Power: Life Sciences made in Tuscany**

Video **Health journeys: from medieval patient care to modern oncology**

2:30 pm - 3:10 pm
Round Table **Oncology of the future: from physical technologies to biotechnologies**

Video **Resilience as a way of life: a better mental wellness**

3:10 pm - 4 pm
Round Table **Brain resilience in a changing world: a conversation between Italian and Japanese scientists**

Video **Active Aging@THE**

Video **NANODEM: between infection and rejection**

4 pm- 6 pm
Video **Extreme light laboratory**

Workshop **FLASH Radiotherapy**

July 18

2 pm - 2:30 pm
Video **T-Power: Life Sciences made in Tuscany**

Video **Health journeys: from medieval patient care to modern oncology**

2:30 pm - 4:30 pm
Workshop **Italian wellbeing. Words, stories and healing spaces**

4:30 pm - 6 pm
Workshop **Precision medicine**

ROUND TABLES

Oncology of the future: from physical technologies to biotechnologies

Italian and Japanese researchers will discuss emerging cancer-fighting technologies, from preclinical advances to basic science applications, including toxins, viruses, lasers, plasma physics, and FLASH therapy, highlighting their potential in innovative cancer treatments.

Brain resilience in a changing world: a conversation between Italian and Japanese scientists

This panel unites Italian and Japanese neuroscientists to explore brain resilience across life, tackling digital overload, isolation, and cognitive decline. They discuss how lifestyle factors like activity, diet, sleep, and social connection can boost brain health and mental well-being globally.

WORKSHOPS

Italian wellbeing. Words, stories and healing spaces
University for Foreigners of Siena, with the participation of Italian language schools in Tokyo and Osaka

The workshop blends storytelling, wellbeing, and work-stress literacy with Italy's thermal and cultural heritage from San Casciano dei Bagni. It fosters a cultural exchange between Italy and Japan, involving Japanese teachers and students.

Precision medicine
Scuola Normale Superiore - Pisa

A workshop on AI techniques to study G-protein coupled receptors (GPCRs), key membrane receptors and drug targets. It features molecular graphics to visualize protein structures, dynamics, and interactions, aiding the design of targeted therapies.

FLASH Radiotherapy
Consiglio Nazionale delle Ricerche - Pisa, Osaka University, University Graduate School of Medicine, Pisa University - Azienda Ospedaliero - Universitaria Pisana

A multidisciplinary event on FLASH Radiotherapy, using ultra-intense beams delivered in short bursts. It covers new acceleration tech, radiobiology, diagnostics, and clinical outlooks. Italian and Japanese researchers discuss research, industry, and public-friendly dissemination.

T-POWER is an initiative by Tuscan Higher Education Institutions and the National Research Council, created to showcase and share Tuscany's excellence in Life Sciences. The project stems from the Tuscany Health Ecosystem (THE), a unique innovation ecosystem in Italy, funded by the National Recovery and Resilience Plan (PNRR), that brings together universities, research institutions, businesses, healthcare, and communities in an integrated model.

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SCUOLA NORMALE SUPERIORE

Sant'Anna Scuola Universitaria Superiore Pisa

Consiglio Nazionale delle Ricerche

Find out more about T-Power and its team