

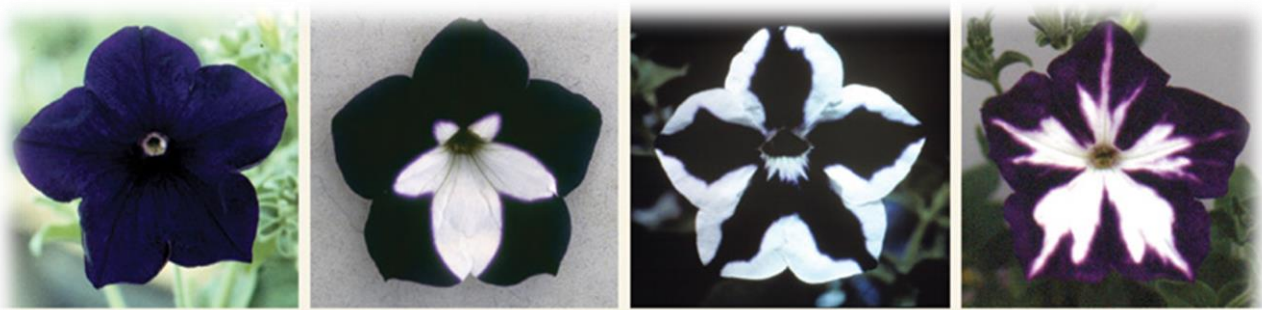
***1st COST iPLANTA CONFERENCE
CREATING A PLANT RNAI RESEARCH
NETWORK
COST Action CA15223***

CONFERENCE OPEN TO ALL SCIENTISTS, TECHNICAL EXPERTS,
REGULATORS, POLICY MAKERS WITH AN INTEREST IN NEW
BIOTECHNOLOGY APPLICATIONS

FEBRUARY 15-17 2017

UNIVERSITY SAPIENZA and CNR HEADQUARTERS

ROME ITALY



Wild type

RNAi

INTRODUCTION OF IPLANTA COST ACTION

Modern agriculture requires a continuous and fast expanding stream of novel scientific and technological innovations to tackle issues regarding quantity and quality of plant production for the benefit of the farmer, the consumer and the environment.

Recently, methods to exploit plant defence mechanisms or changing plant metabolism, by RNA silencing, have been shown to be promising. RNA silencing is a sequence-specific mechanism of gene expression regulation present in eukaryotes that is based on the action of micro- and small interfering RNA molecules (miRNAs and siRNAs) derived from double-stranded RNA precursors. These small RNAs can trigger post-transcriptional gene silencing (PTGS), since they induce the sequence-specific cleavage of a target RNA and/or the inhibition of translation. RNA silencing-based strategies represent useful tools for functional genomics and crop biotechnology.

RNA interference (RNAi) can be used in a 'within species' mode to improve plant composition by removing or reducing anti-nutrients, allergens and toxins while enhancing levels of beneficial nutrients, and to improve plant growth and productivity by suppressing undesirable traits and thus switching resources to more beneficial traits such as quality and yield. In addition, gene expression in pathogens (particularly viruses and fungi), invertebrate pests and parasitic plants can be targeted using a 'cross-species' or 'host-induced' silencing approach. Plants can be genetically modified to produce double-stranded RNAs which trigger silencing and thus affect essential physiological functions in pest or disease-causing organisms. RNA silencing functions also as a defence mechanism against viral infection, and RNA silencing-based technologies have been successfully applied to induce virus resistance in different plant species, such as fruit trees.

Therefore, this technology has the potential to introduce novel pest and disease resistance, quality and nutritional improvements, and changes in metabolism which will increase crop productivity and/or reduce post-harvest losses. However, it is important to consider that the methods used are based on siRNA and miRNA initiating silencing of a target gene in a very precise manner.

The new COST Action 15223 iPlanta has the main objective to examine the scientific challenges of RNAi techniques for disease and pest control, and metabolic enhancement of plants. It will identify the most advanced knowledge available for this tool and the more important applications for the improvement of agriculture, forestry and food sector. For all major applications it will consider the best practices for risk assessment/management and the socio-economic impact of new products from RNAi technology.

AIM OF THE CONFERENCE

1. Review existing knowledge and state of the art to provide a solid background for new developments, applications and research information and to support risk assessments. Identify knowledge and data gaps.
2. A study of the current situation on the development and application of RNAi in GM crop plants worldwide.
3. Collect scientific information about biosafety aspects linked to RNAi GM plants and promote research collaborations in this area in order to reduce uncertainty about potential non-target and off-target effects of RNAi.
4. Review the social and economic impacts of GMP RNAi.

CONFERENCE PROGRAMME

DAY 1 – WEDNESDAY, FEBRUARY 15TH, 2017 MORNING – ARRIVAL

- **NATIONAL RESEARCH COUNCIL, Piazzale Aldo Moro, 7 – AULA MARCONI**
- **12:00 – 13:00 – Registration – poster display (size 90Hx80L)**
- **13:00-13:05 - Welcome by Prof Bruno Mezzetti and Cristina Vettori**
- **13:00 – 16:15 - Working Group Meetings** – 5 separate WG meetings as parallel sessions. For each parallel session, the WGs Leader and Vice Leader have identified speakers among the Action experts presenting research programs in line with the scientific goals defined for the start of the Action. WG leaders will organise the programme in their session, promote and coordinate the discussion and develop plans of action for the WG.

PARALLEL SESSIONS

Session 1 – RNAi Technology (WG1) CHAIRPERSONS GUY SMAGGHE AND MICHEL RAVELONANDRO

AUTHORS	ORAL PRESENTATION	
K. KASTAROU, A. OULAS, E. MITTA, E. DADAMI, I. VLATAKIS, K. KALANTIDIS	DISARMING PLANT DEFENSE BY RNAI: THE USE OF DCL KNOCK -DOWN <i>NICOTIANA BENTHAMIANA</i> PLANTS FOR INFECTION AND OVEREXPRESSION STUDIED	10 min
Z.SZWEYKOWSKA-KULINSKA, A.PACAK, K. KRUSZKA, A.SWIDA-BARTECZKA, P. NUC, WOJCIECH KARLOWSKI	MICRORNA 444.1 EXPRESSION CONTROLS BARELY TILLERING IN RESPONSE TO HEAT STRESS.	10 min
C. SARMIENTO, K. KÄRBLANE, M. TOOMPUU, J. GERASSIMENKO, E. TRUVE	ABCE1 IS A HIGHLY CONSERVED ENDOGENOUS SUPPRESSOR OF RNA SILENCING	10 min
A.DALAKOURAS, M. WASSENEGGER, J.N. MCMILLAN, V. CARDOZA, I. MAEGELE, E. DADAMI, M. RUNNE, G. KRCZAL AND MICHAEL WASSENEGGER	INDUCTION OF SILENCING IN PLANTS BY HIGH-PRESSURE SPRAYING OF IN VITRO-SYNTHEZIZED SMALL RNAS.	10 min

A.M.R. GATEHOUSE , M.G. EDWARDS	RNAi –MEDIATED KNOCKDOWN OF THE VOLTAGE-GATED SODIUM ION CHANNEL (PARALYTIC A) CAUSES MORTALITY IN THE INSECT STORAGE PEST TRIBOLIUM CASTANEUM	10 min
M. GHANIM , S. KANAKALA	SILENCING GENES INVOLVED IN THE INTERACTION BETWEEN THE WHITEFLY <i>BEMISIA TABACI</i> AND <i>TOMATO YELLOW LEAF CURL VIRUS</i>	10 min
B. MOLESINI , G.L. ROTINO, T. PANDOLFINI	RNA SILENCING AS A TOOL FOR STUDYING GENES INVOLVED IN FRUIT SET	10 min
T. LAWRENSEN, O. SHORINOLA, M. SMEDLEY, S. HAYTA, P. HUNDLEBY, W. HARWOOD	A COMPARISON OF TARGET GENE SUPPRESSION BY RNAi AND RNA-GUIDED Cas9 NUCLEASE	10 min
L. TOPPINO , M. KOOIKER, M. LINDNER , M. KATER, G.L. ROTINO	REVERSIBLE MALE STERILITY INDUCTION SYSTEM BASED ON ARTIFICIAL-MICRORNA MEDIATED INACTIVATION OF TWO GENERAL TRANSCRIPTION FACTORS IN EGGPLANT (<i>SOLANUM MELONGENA</i> L.)	10 min
Y. FEI, A. MOLNAR	INVESTIGATING THE EFFICACY OF RNA SILENCING-MEDIATED EPIGENETIC MODIFICATIONS IN VIRUS INFECTED PLANTS	10 min
G. DI RUOCCO, G. BERTOLOTTI, E. PACIFICI, L. POLVERARI, S. SABATINI, P. COSTANTINO AND R. DELLO IOIO	THE CONTROL OF CORTEX ANATOMY VIA MIRNA TARGET MIMICRY	10 min
AUTHORS	POSTERS	
M. TOPALOV, G. YAHUBYAN, M. GOZMANOVA, E. DASKALOVA, E. APOSTOLOVA, V. BAEV	EXPLORING THE MIRNAOME IN HABERLEA RHODOPENSIS – A MODEL PLANT FOR DROUGHT TOLERANCE	P
L. SWEVERS , J. VONTAS, K. KALANTIDIS	PLANT VIRUSES FOR DELIVERY OF RNAI TRIGGERS FOR PEST CONTROL: POSSIBILITIES AND OBSTACLES	P
M.TERZIKJ , E.SHUKAROVA STEFANOVSKA, E. MISKOSKA MILEVSKA, Z. POPOVSKI, Z.ARSOV, D. PLASHESKA KARANFILSKA	MICRORNA AND TOBACCO SPECIES: MACEDONIAN STORY YET TO BE TOLD	P
M. PETEK , K. GRUDEN	SELECTION AND VALIDATION OF NOVEL TARGETS FOR RNAi-BASED CONTROL OF COLORADO POTATO BEETLE	P
S. KAFKAS , E. KAFKAS, M.GÜNEY, M. ZARIFIKHOSROSHAHI, H. KARCI, N.	EXPRESSION ANALYSIS OF CANDIDATE GENES RESPONSIBLE FOR BUD ABSCISSION IN PISTACHIO	P

ÇOBAN, H. TOPÇU, M.A. GÜNDEŞLİ, S. ETİ, Ş.KARABIYIK, N.ASLAN S. ARPACI		
ERNA KARALIJA	SEED PRIMING, A TOOL FOR PLANT PRIMING?	P
K. RAŽNÁ, L. HLAVÁČKOVÁ, J. NŮŽKOVÁ, J. MORAVČÍKOVÁ	MICRORNA-BASED MOLECULAR MARKERS IN PLANT RESEARCH	P

Session 2- RNAi Applications (WG2) CHAIRPERSONS HUW JONES AND HELY HÄGGMAN

AUTHORS	ORAL PRESENTATION	
K. PRENTICE, O. CHRISTIAENS, I. PERTRY, M. GHISLAIN, G. GHEYSEN, G. SMAGGHE	RNAi-MEDIATED STRATEGY TO CONTROL THE AFRICAN SWEETPOTATO WEEVILS <i>CYLAS PUNCTICOLLIS</i> AND <i>CYLAS BRUNNEUS</i> (COLEOPTERA, BRENTIDAE)	15 min
K. KANYUKA, A. MACHADO, M. URBAN, W. S. LEE, N. BROWN, R. KING, E. YAMAZAKI LAU, C. SPARKS, A. L. V. BONATO, C. S. TIBOLA, N. F. MARTINS, F. J. ARAGÃO, J. WEST, J. M. C. FERNANDES, K. E. HAMMOND-KOSACK	HOST-INDUCED GENE SILENCING FOR THE CONTROL OF FUSARIUM HEAD BLIGHT IN WHEAT FIELDS	15 min
I. ZAGRAI, M. RAVELONANDRO, R. SCORZA, L. ZAGRAI, N. MINOIU	FIELD TRIALS FOR <i>PLUM POX</i> VIRUS RESISTANCE OF HONEYSWEET TRANSGENIC PLUM IN ROMANIA	15 min
V. ILARDI, E. DI NICOLA, S. MONTICELLI, A. GENTILE, R. C. GARCIA-ALMODOVAR, L. BURGOS, M. TAVAZZA	RNAi-MEDIATED RESISTANCE TO THE QUARANTINE VIRUS CAUSING SHARKA DISEASE IN STONE FRUITS	15 min
S.SABBADINI, C.O.LIMERA, B.MOLESINI, T.PANDOLFINI, O.NAVACCHI, B.MEZZETTI	THE BOTTLENECKS IN OBTAINING AN EFFICIENT TRANSFORMATION PROTOCOL FOR RNAi SHARKA RESISTANCE IN PEACH	15 min
AUTHORS	POSTERS	
J. POLÁK, J. K. KUNDU, P. KOMÍNEK, E. BEONI, AND T. NEUBAUEROVÁ	INVESTIGATION ON THE TRANSGENIC PLUM <i>PRUNUS DOMESTICA</i> L., CLONE C5 (CV. HONEYSWEET) FOR PROTECTION AGAINST SHARKA DISEASE.	P
CAPPETTA E., ANDOLFO G., ERCOLANO M.R.	APPLICATIONS OF GENOME ENGINEERING TECHNOLOGIES TO REWRITE	P

	DISEASE RESISTANCE SYSTEM	
H. FULGOSI, S. JURIC	ANTISENSE RNA SILENCING OF THE TROL PROTEIN INVOLVED IN PLANT PHOTOSYNTHETIC ENERGY PARTITIONING	P
P. CEJNAR, L. OHNOUTKOVÁ, M. KOSTKOVÁ, T. VLČKO, J. K. KUNDU	TRANSFORMATION OF SPRING BARLEY WITH PARTIAL WDV REPLICATION PROTEIN	P
O. LAUNER, O. SHOSEYOV.	DOWN-REGULATION OF ENDOGENOUS PEANUT GENES VIA RNAI FOR THE REDUCTION OF PEANUT ALLERGENICITY	P

SESSION 3 - RNAi biosafety (WG3) CHAIRPERSONS SALVATORE ARPAIA AND ANTJE DIETZ-PFEILSTETTER

AUTHORS	ORAL PRESENTATION	
K.M. PARKER, B. MATEESCU, M. SANDER	ENVIRONMENTAL FATE OF DOUBLE-STRANDED RNA (DSRNA)-MECHANISTIC STUDIES ON DSRNA ADSORPTION AND DEGRADATION IN LABORATORY SYSTEMS	15 min
K. PURNHAGEN	REGULATING GMOS IN EUROPE: HOW SCIENCE LAW IS MOVING TO A LAW OF FEARS, AND WHY IT MATTERS	15 min
STUART J. SMYTH	CANADIAN REGULATORY PERSPECTIVES ON GENOME ENGINEERED CROPS	15 min
H.M.T. HOKKANEN, I. MENZLER-HOKKANEN	RNAi-BASED CONTROL OF THE POLLEN BEETLE <i>Meligethes aeneus</i> : RISK ASSESSMENT OF USING TRAP CROPS AS A DELIVERY PLATFORM	15 min
V. BARRAGAN-BORRERO, D. VAN LEEUWEN, K. SOSTAR, B. MATEESCU	MODELS FOR INVESTIGATING THE FUNCTIONAL TRANSFER OF PLANT-DERIVED RNA IN MAMMALIAN CELLS	15 min

SESSION 4 - RNAi socio-economy (WG4) CHAIRPERSONS JUSTUS WESSELER AND KONSTANTINOS KARANTININIS

AUTHORS	ORAL PRESENTATION	
K. M. NIELSEN	NEW TECHNIQUES, SCIENTIFIC AND REGULATORY ASPECTS	15 min
A MIHNEA, D. NIKOLOV	PRODUCTION RISK IN EXPECTED GROSS MARGIN BASED ON NEW METHODS OF PLANT PEST AND DISEASE RESISTANCE AND IMPROVING CROP QUALITY AND YIELD BASED OF USING ANALYTIC NETWORK MODELLING	15 min
D. PIOVAN	NEW BREEDING SOLUTIONS FOR NEW FARMERS' CHALLENGES	15 min

DAY 2 – THURSDAY, FEBRUARY 16TH, 2017

**IPLANTA CONFERENCE
SAPIENZA UNIVERSITY, ROOM – AULA MONTALENTI**

8:30 WELCOME & OPENING ADDRESS: BRUNO MEZZETTI, PAOLO COSTANTINO AND GILBERTO CORBELLINI (15 mins)

8:45 to 18:00 - Conference Joint Meeting organized in 5 sessions, one for WG, of 90 min each. Each session will contain one Lecture of 30 min and 3 presentations and discussion each of 15 min.

SESSION 1 - RNAi Technology (WG1) CHAIRPERSONS GUY SMAGGHE AND MICHEL RAVELONANDRO

AUTHORS	ORAL PRESENTATION	
S. AVNET, A. MASSA, N. BALDINI	FRUIT-DERIVED NANOVESICLES AS CARRIER OF mRNAs, MICRORNAs AND BIOACTIVE COMPOUNDS WITH EFFECTS ON BONE HEALTH	30 min
O. CHRISTIAENS, G. SMAGGHE	THE CHALLENGES OF RNAI-MEDIATED INSECT PEST CONTROL AND THE SEARCH FOR NOVEL DELIVERY METHODS	15 min
K. PERSSON-HODÉN, J. FOGELQVIST, A. ÅSMAN, C. DIXELIUS	EXPLOITING RNA BIOLOGY TO REDUCE THE LATE BLIGHT DISEASE ON POTATO	15 min
M. RAVELONANDRO, R. SCORZA, I. ZAGRAI, C. DARDICK, A. CALLAHAN, L. ZAGRAI, P. BRIARD	INDUCING RNAI MECHANISMS AS A WAY OF TACKLING OF THE PLUM POX VIRUS GENOME IN WOODY PERENNIAL PLANTS	15 min

10:00

SESSION 2 – RNAi Applications (WG2) CHAIRPERSONS HELY HÄGGMAN

AUTHORS	ORAL PRESENTATION	
H. HÄGGMAN, M. FLADUNG	RNAI IN FOREST TREES	30 min
M. GUIDARELLI, S. SABBADINI, F. NEGRINI, B. MEZZETTI, E. BARALDI	CHARACTERIZATION OF THE ROLE OF A LECTIN GENE IN THE SUSCEPTIBILITY OF STRAWBERRY FRUITS TO COLLETOTRICHUM ACUTATUM	15 min
H. VANDERSCHUREN	RESISTANCE OF CASSAVA EXPRESSING dsRNAs AGAINST CODING SEQUENCES OF GEMINIVIRUSES	15 min
J. VONTAS, E. PITSILI, N. KRYOVRISINAKI, I. MOUSTAKA, A. SANDRI, E. MOROU, E. SIOZOU, RIGA M.,	PLANT MEDIATED RNA INTERFERENCE (RNAi) TO BLOCK P450 BASED DETOXIFICATION OF INSECTICIDES AND PLANT ALLELOCHEMICALS IN AGRICULTURAL PESTS	15 min

RODITAKIS E., VAN LEEUWEN T., D'AMBROSIO C., KALANTIDIS K.		
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11:15 - 11:30 Coffee break

SESSION 3 – RNAi biosafety (WG3) CHAIRPERSONS SALVATORE ARPAIA AND ANTJE DIETZ-PFEILSTETTER

AUTHORS	ORAL PRESENTATION	
N.PAPADOPOULOU, F. ALVAREZ, Y. DEVOS, A. LANZONI, C. PAOLETTI, M. RAMON, E. WAIGMANN	RISK ASSESSMENT OF RNAi-BASED GM PLANTS	30 min
I. URRU, J.B. SWEET, A. DIETZ-PFEILSTETTER, S. ARPAIA	POSSIBLE ENVIRONMENTAL EFFECTS OF RNAi-BASED GM PLANTS	15 min
O. CHRISTIAENS, G. SMAGGHE	RNAi-BASED PEST CONTROL: CURRENT UNDERSTANDINGS IN TERMS OF ENVIRONMENTAL SAFETY AND NON-TARGET EFFECTS	15 min
HARRY A. KUIPER AND ESTHER J. KOK	FOOD SAFETY ASSESSMENT STRATEGIES FOR CROP PLANTS DERIVED THROUGH RNAi – MEDIATED GENE SILENCING	15 min

13:00- 14:30 Lunch

SESSION 4 - RNAi socio-economy (WG4) CHAIRPERSONS JUSTUS WESSELER AND KONSTANTINOS KARANTININIS

AUTHORS	ORAL PRESENTATION	
J. WESSELER	ASSESSING SOCIO-ECONOMIC IMPACTS OF GMP RNAi-TECHNOLOGIES: CONCEPTS AND METHODS	30 min
K. KARANTININIS, S. CHATZOPOULOU	THE POLITICAL ECONOMY OF THE EUROPEAN AGRI-FOOD CHAIN	15 min
T. J. VENUS, D. DRABIK, J. WESSELER	REGULATION OF NEW PLANT BREEDING TECHNIQUES: THE CASE OF RAPESEED IN THE EU	15 min
V. VENTURA, D. FRISIO	NATURALLY GM: THE DEVELOPMENT OF NEW BREEDING TECHNIQUES THROUGH PATENT DATA ANALYSIS	15 min

16:15- 16:30 Coffee break

SESSION 5 - RNAi Communication and public acceptance (WG5) - CHAIRPERSONS HILDE-GUNN OPSAHL-SORTEBERG AND MATINA TSALAVOUTA

G. CARRADA	THE OPPORTUNITY OF A FRESH START	30 min
E. MULLINS	COMMUNICATING TO ADDRESS PERCEPTIONS AROUND PLANT BREEDING TECHNOLOGIES: EXPERIENCES FROM THE AMIGA GM STUDY ON POTATO ENGINEERED FOR LATE BLIGHT RESISTANCE	15 min
H-G. OPSAHL SORTEBERG	NEW SCIENCE DISSEMINATION OPPORTUNITIES ON FACEBOOK PLATFORMS	15 min
MATINA TSALAVOUTA	A TALE OF TWO TRIALS: COMMUNICATING RECENT RESEARCH ON GM CROPS AT ROTHAMSTED RESEARCH	15 min

17:00- 18:00 General Discussion

20.30 Conference Dinner: Resturant La Pantera Rosa (Piazza del Verano, 84 – near CNR. Meat, fish or vegetarian menu at 30€).

DAY 3 – FRIDAY, FEBRUARY 17TH, 2017

ROUND TABLE AND PRESSE CONFERENCE AT NATIONAL RESEARCH COUNCIL (CNR), Piazzale Aldo Moro, 7, AULA MARCONI

- **8:45 -11:15 Round table** – Chair Person Bruno Mezzetti; Jeremy Sweet
 - *WG Leaders: Guy Smagghe, Hely Häggman, Salvatore Arpaia, Justus Wessler, Hilde-Gunn Opsal-Sorterber*
 - *Science: Attila Molnar (Edinburg University), Nicola Baldini (University of Bologna), Harry Kuiper (WUR), Dario Frisio (UniMi)*
 - *Stakeholder: Deborah Piovan (Confagricoltura), Oriano Navacchi (Vitroplant), Mirco Montefiore (NewPlant)*
 - *Communication: Gilberto Corbellini (Sapienza), Giovanni Carrada (Quark), Matina Tsalavouta (Rothamsted R.), Cristina Vettori (CNR)*
 - *Organizations: Anna Lanzoni and Nicoletta Papadopoulou (EFSA), Francesco Loreto (CNR), Valeria Giovannelli (ISPRA)*
- **11:15- 11:30 Coffee break**
- **11:30 – 12:30 Press conference** : Bruno Mezzetti; Jeremy Sweet, Gilberto Corbellini, Giovanni Carrada, Hilde-Gunn Opsal-Sorterber
- **12:30 – 13:30 Lunch**
- **13:30 – 16:00 MC Meeting** – only for MC members.
- **16:30 End of the meeting**



iPlanta

IN COLLABORATION WITH:



Consiglio Nazionale delle Ricerche



Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile



COST ACTION CA 15223 MODIFYING PLANTS TO PRODUCE INTERFERING RNA

**at the CNR/ Sapienza(Rome, Italy)
1st CONFERENCE**

Venue

The First Conference will take place at the NATIONAL RESEARCH COUNCIL – CNR headquarters and the Sapienza University of Rome.

□ **At the NATIONAL RESEARCH COUNCIL, Piazzale Aldo Moro, 7, will be held the WG Workshops on Wednesday 15/02/2017 and the Round Table, Press Conference and MC meeting on Friday 17/02/2017**

□ **At the Sapienza University, Room – Aula Montalenti, will be held the iPLANTA Conference on Thursday 16/02/2017**

Both places of the 1st iPLANTA Conference (B) are 18 min walking distance from the Main Station called “Stazione Termini” (A)

