

# Single Molecule Activation and Computing

## Fact Sheet

### Project Information



FOCUS

Grant agreement ID: 270483

[Project website](#) 

Status  
Closed project


Start date  
1 January 2011

End date  
31 March 2014

Funded under  
FP7-ICT

Overall budget  
€ 4 322 845

EU contribution  
€ 3 174 259

Coordinated by  
SCUOLA INTERNAZIONALE  
SUPERIORE DI STUDI AVANZATI  
DI TRIESTE  
 Italy

## Project description

### Molecular Scale Devices and Systems

The present project, FOCUS, will build a novel generation of biologically inspired molecular devices (MDs) based on the developments of new photonic tools. These photonic tools will use Plasmon Polariton and two-photon technology, enabling focused light spots with a diameter around 10 nm. FOCUS will also develop new light sensitive molecules that will be selectively activated by our new photonic tools. These new technological innovations will provide a way to control activation of single light sensitive molecules and will allow the investigation of molecular computation in a biological environment and with an unprecedented resolution. On the basis of these investigations and by using the developed new tools, FOCUS will design and test new MDs for amplification and information processing. FOCUS will: i - provide new

photonic devices to control single molecules; ii – lay out the basis for understanding molecular computation in biological systems; iii - provide proofs of concept and suggestions for designing new molecular artificial computing systems; iv- build prototypes of these new MDs. FOCUS has formed a highly interdisciplinary consortium composed of nanotechnologists able to fabricate the new photonic devices - i.e. Enzo Di Fabrizio (IIT), Alpan Bek (METU) and Marco Lazzarino (CBM), chemists able to develop the photoswitches and assemble the MDs – i.e. Pau Gorostiza (IBEC) and Ljiljana Fruk (KIT) and biologists able to understand molecular mechanisms – i.e. Vincent Torre (SISSA) and Fabio Benfenati (IIT). The two companies RappOptoElectronic and NT-MDT Europe BV will transform the new tools and devices into marketable products.

## Field of science

/natural sciences/computer and information sciences/data science/data processing

## Programme(s)

## Topic(s)

## Call for proposal

FP7-ICT-2009-6

## Funding Scheme

CP - Collaborative project (generic)

## Coordinator



### SCUOLA INTERNAZIONALE SUPERIORE DI STUDI AVANZATI DI TRIESTE

Address

Via Bonomea 265

34136 Trieste

 Italy

[Website](#) 

Administrative Contact

**Gabriele RIZZETTO (Mr.)**

Activity type

**Higher or Secondary**

**Education Establishments**

[Contact the organisation](#) 

EU contribution

**€ 580 888**

## Participants (7)

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### RAPP OPTOELECTRONIC GMBH

 Germany

EU contribution

**€ 197 415**

Address

**Gehlenkamp 9 A  
22559 Hamburg**

Activity type

**Private for-profit entities  
(excluding Higher or  
Secondary Education  
Establishments)**

[Contact the organisation](#) 

Administrative Contact

**Gert Rapp (Dr.)**

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### KARLSRUHER INSTITUT FUER TECHNOLOGIE

 Germany

EU contribution

**€ 478 000**

Address

**Kaiserstrasse 12  
76131 Karlsruhe**

Activity type

**Higher or Secondary  
Education Establishments**

[Website](#) 

[Contact the organisation](#) 

Administrative Contact

**Christian Röthig (Dr.)**

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### FUNDACIO INSTITUT DE BIOENGINYERIA DE CATALUNYA

 Spain

EU contribution

**€ 521 600**

Address

**Carrer Baldori Reixac Planta  
2A 10-12  
08028 Barcelona**

Activity type

**Research Organisations**

[Website](#) 

[Contact the organisation](#) 

Administrative Contact

**Pau Gorostiza (Dr.)**

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### CONSORZIO PER IL CENTRO DI BIOMEDICINA MOLECOLARE SCARL



 Italy

EU contribution

**€ 300 552**

Address

**Strada Statale 14 Km 163 5  
Basovizza  
34149 Trieste**

Activity type

**Research Organisations**

[Website](#) 

[Contact the organisation](#) 

Administrative Contact

**Nicola Dorigo Salamon (Mr.)**

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## FONDAZIONE ISTITUTO ITALIANO DI TECNOLOGIA

 Italy

EU contribution

**€ 680 088**

Address

**Via Morego 30  
16163 Genova**

Activity type

**Research Organisations**

[Website](#) 

[Contact the organisation](#) 

Administrative Contact

**Claudia Schiaffino (Ms.)**

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## NT-MDT Europe BV

 Netherlands

EU contribution

**€ 246 036**

Address

**High Tech Campus 83  
5656AG Eindhoven**

Activity type

**Private for-profit entities  
(excluding Higher or  
Secondary Education  
Establishments)**

[Website](#) 

[Contact the organisation](#) 

Administrative Contact

**Sergey Lemeshko (Dr.)**

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## MIDDLE EAST TECHNICAL UNIVERSITY

 Turkey

EU contribution

**€ 169 680**

Address

**Dumlupinar Bulvari 1  
06800 Ankara**

[Website](#) 

Administrative Contact

**ALPAN BEK (Dr.)**

Activity type

**Higher or Secondary  
Education Establishments**

[Contact the organisation](#) 

**Last update:** 1 August 2019

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