

## Projets

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### ERA NET RUS PLUS Project MINERVA

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#### Magneto-plasmonic hybrid nanosensors as versatile platform for breast cancer cell detection

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- Project Coordinator and French Coordinator:

Prof. Igor Chourpa, director of the laboratory EA6295 Nanomédicaments et Nanosondes at Université François Rabelais de Tours (UFRT), Tours, France.

[Igor.chourpa@univ-tours.fr](mailto:Igor.chourpa@univ-tours.fr)

+33 2 47 36 71 62

- German Coordinator:

Prof. A. Fahmi, director of a laboratory at Hochschule Rhein-Waal University of Applied Sciences (HRWU), Kleve, Germany.

- Russian Coordinator:

Prof. A.V. Feofanov, director of a laboratory at Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry (IBC), Russian Academy of Sciences, Moscow, Russian Federation.

Launched in January 2016, the international research project "MINERVA" is a cooperation between academic research teams from France (Université François Rabelais de Tours), Germany (Rhein-Waal University of Applied Sciences) and Russia (Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry). The project is co-funded by :

French Ministry of National Education, Higher Education and Research (MENESR)

German Federal Ministry of Education and Research (BMBF)

Russian Foundation for Basic Research (RFBR).

The interdisciplinary project "MINERVA" aims at investigating new biomedical nanomaterials that contribute to the diagnosis and treatment of breast cancer. The 24-month project assembles and tests new well-defined hybrid nanosystems consisting of inorganic cores and organic shells. Unlike the treatment by conventional chemotherapy, in which healthy tissue is also damaged, the newly developed nanomaterials are intended to selectively deliver the active substances into the cancer cells. In addition, the nanomaterials should assist the surgeon in identifying the diseased tissue by its optical response.

The kick-off meeting of the consortium has been held in Kleve, Germany, in February 2016 (see photographs below). In addition to meeting members of all the partner labs, this event has offered the opportunity to present the expertise of the labs, to summarize the objectives of the project and the scientific program, including the schedule of exchanges.

The project has allowed to start the PhD thesis of Mathias PACAUD, in co-direction of Professors Igor Chourpa and Amir Fahmi.

The results of the MINERVA project, have been presented as a part of the following publication:

- ***Folic acid-capped PEGylated magnetic nanoparticles enter cancer cells mostly via clathrin-dependent endocytosis.***  
Allard-Vannier E, Hervé-Aubert K, Kaaki K, Blondy T, Shebanova A, Shaitan KV, Ignatova AA, Saboungi ML, Feofanov AV, Chourpa I.  
Biochim Biophys Acta. 2016 Dec 2. pii: S0304-4165(16)30485-8. doi: 10.1016/j.bbagen.2016.11.045. [Epub ahead of print] PMID: 27919801



Left : Statue of Minerva (the Roman goddess of wisdom and sponsor of arts, trade and strategy) in one of the public gardens in Kleve, Germany. Right : KOM participants in february 2016.