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## MODELS FOR INVESTMENT IN R&D AND TECHNOLOGY TRANSFER IN NANOTECHNOLOGY

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### Abstract

#### I. TOPIC UNDER ANALYSIS

This document analyses the main models that can be implemented to promote investment in research and development (R&D) processes and active collaboration between companies and nanotechnology research centres and institutions, with a view to implementing effective and productive models of technology transfer.

#### II. MODELS OF COLLABORATION / TECHNOLOGY TRANSFER

The creation of innovative technological solutions in the context of nanotechnology that meet the effective needs of the market, calls for the development of – increasingly agile - mechanisms for sustained collaboration and partnership between universities/research centres and companies. Mechanisms that make it possible to identify, on the one hand, technological opportunities for and challenges to companies as they arise and, on the other, the best ways to overcome the challenges identified.

Sharing of knowledge and solutions between organisations that have specific scientific or technological knowledge – in the case of nanotechnology, in such fields as life sciences, nanoengineering, nanobiotechnology,... - and organisations that have an interest in putting that knowledge to use, particularly for purposes of commercial application, plays a key role in pursuing the objectives mentioned.

In this respect, in order for a company, and in particular a technology-based company, to position itself competitively in the nanotechnologies market, it is essential that it be capable of generating and using knowledge to develop new products, processes and services. Collaboration with universities/research centres constitutes an excellent means of achieving this aim.

In this context moreover, collaboration with companies at all stages of the knowledge creation process, not just the final marketing stage, is a significant means of ensuring that R&D is market-oriented and meets the needs of the market.

Collaboration between universities/research centres and companies, by encouraging the creation of market-oriented technologies, has benefits for all agents of the inventive/creative process: researchers, universities/research centres and companies.

Researchers will of course find it easier to obtain funding for their work, along with greater exposure and promotion of their projects in the market.

Research centres, for their part, will benefit from enduring partnerships with companies while at the same time carrying out projects in a more competitive R&D environment.

Companies have the advantage of obtaining, often at more accessible costs, specialist human resources with extensive know-how in their areas of activity and dedicated exclusively to the project in hand.

However, for effective collaboration, there are a number of requirements that must be taken into account, such as:

- **Internal regulations/policies:** universities/research centres (and companies) must create internal rules that clearly frame their R&D activities and their policy with regard to intellectual property and technology transfer;

- **Detailed project identification:** the project must be properly identified, stating intended endpoints, terms of finance, deliverables, deadlines, ownership of IP and associated royalties, payment of registration costs, and licensing terms, among other things.
- **Identification of opportunities and obstacles, project approval and supervision:** universities/research centres and companies must, in analysing the project, correctly identify the opportunities and constraints associated with it, including its economic viability, equipping themselves with means of supervising the project once approved;

In practice, particular care must be taken over a series of matters that must be properly reflected in a contract between the interested parties (see the flow chart in figure 1 below). All of these points can take very different forms and have very different effects depending on what is agreed. This in turn may depend not only on the area of activity and the maturity of the market, but also on the commercial and legal models adopted, which can in many cases be related to the nature of the entity that proposes the project (company, several companies – which may even be competitors in the market – or a researcher /centre).

## References

[1] Silva, Fernando Resina da; Mendonça, Helena Correia de; Vieira de Almeida & Associados; 2013

**Figure 1:** Collaboration between researchers, universities/research centres and companies

