

### **Technology Transfer in UNAM: Role of Coordinación de Innovación y Desarrollo (CID)**

The aim of this editorial is to give a brief overview of the role of the Coordinación de Innovación y Desarrollo (CID) as UNAM's Technology Transfer Office (TTO), as well as to briefly mention some achievements of the several fields that this TTO manages.

It is widely recognized that the impact of UNAM in the social, economical, political, cultural, artistic and scientific development in Mexico has been enormous and there is not a single area in which UNAM has not participated. Mexico cannot be understood as the country it is, without the participation of UNAM.

From the historic perspective, the development in Mexico of scientific research in different fields has originated in UNAM. Today this University is the most influential Mexican institution in the field of scientific research, as can be seen using different criteria, as the proportion of members of the Sistema Nacional de Investigadores (SNI) in all levels and especially in the higher rank, or the contribution of scientific articles in indexed journals by UNAM researchers that are nearly 30% of the articles published by academics working in Mexican institutions.

However, the great impact that UNAM has had in the development of scientific research in Mexico has not been accompanied by comparable results in the area of innovation and technology transfer. There have been important efforts to fulfill this task, some of which are mentioned in this editorial, but UNAM has still a long way to go in achieving the goal of being one of the most important TTO in Latin America, the status that correspond to this University.

The interest in contributing to technology development can be seen if it is considered that UNAM's Institutes of Biotechnology (IBt) and Renewable Energy (IER), as well as the Centers for Applied Sciences and Technology Development (CCADET), and Nanosciences and Nanotechnology (CNN) are devoted both to research and to innovation and technology development, and other Faculties, Institutes and Centers have also contributed significantly to the generation of technology and the creation of new technology-based business. For example 10 spin offs have been formed based on technologies developed in IBt, CCG, ICF and IER.

To increase UNAM's impact in the field of innovation and technology and to avoid that its contribution in this area was scattered and not systematic, several initiatives to create a structure within UNAM to organize the efforts in the area of technology transfer and innovation have taken place, starting in 1983 with the creation of the Dirección General de Desarrollo Tecnológico, and in 2008 Dr. José Narro created CID in order to give support in the field of innovation and technology transfer to all members of UNAM community.

The purpose of CID, as UNAM's OTT is to provide support services to all entities of UNAM in a number of different activities aimed to establish a linkage between them and the private, government and social sectors through initiatives, programmes, projects, technologies, researchers, professors, students and graduates, with direct collaboration of the internal linking units. CID has the highest rank in UNAM structure. Mtro. Juan Manuel Romero, who is the Coordinador de Innovación y Desarrollo, directly depends on UNAM's Rector, and the Dirección General de Vinculación (DGV), which I lead, is the main operative area of CID.

CID's activities are divided in three areas:

Technical Services & Consulting: providing technical services to fulfil the needs of the private, public or social sectors, taking advantage of the university's knowledge, capabilities, expertise & facilities. This CID area provides support to people or organizations demanding a specific technique or technological service that can be provided by UNAM. The requests go from very specific services up to

demands that involve the participation of experts and research teams that work in different UNAM entities. This area is responsible for the coordination of several projects in which academics working in different UNAM entities participate such as the construction of an integrative model for the production and management of energy in Mexico.

Business Incubation (spin offs): it's a process addressed to the members of UNAM community to support and facilitate their entrepreneurial efforts for the formation and development of new business ventures through mentoring, consulting and training actions. It is the area of CID responsible for promoting entrepreneurship among UNAM students and academic personal, as well as for the support in the incubation of new spin-offs. In order to promote the generation of businesses, especially those that are sustained in technological developments made by UNAM academic personnel, a number of offices were created at different UNAM entities having a method of incubation and providing some resources to projects that are accepted in these offices. The ten incubating offices that are now functioning in UNAM are coordinated by CID and form a network called InnovaUNAM. In the five and a half year period since the creation of InnovaUNAM, the total number of projects have been incubated are 126.

Technology Transfer: it might proceed in two ways: as a full transfer, yielding ownership of the intellectual property to the other party (this mode is not preferred by UNAM); or licensing, granting the right of use of the knowledge over a defined period of time, for research, production and/or commercialisation purposes.

CID was certified in 2013 by the Fund for Sectorial Innovation (FINNOVA), Secretary of Economy and CONACYT as an official Technology Transfer Office. This certification allows that UNAM researchers participate in FINNOVA calls in order to obtain grants. FINNOVA gives 70% of the granted money, and CID gives the remaining 30%. At present, thirteen of the fourteen projects presented by CID-UNAM to FINNOVA have been technically approved, but only seven have obtained funding, due to insufficient resources of FINNOVA.

In the five years and a half of CID labor the activities concerning patent application filings have increased significantly, to the point that in 2012 the Mexican Patent Office (IMPI) granted CID the title of Official Patenting Center. There are some Faculties and Institutes that directly send their patent's request to IMPI or other foreign patenting offices, but CID gives its support to all UNAM entities that ask for it.

It is important to mention that CID devotes a significant effort to promote the commercialization of the technologies that are managed by this office, and that in 2014 this effort lead to the licensing of seven UNAM technologies, some to external companies and others to UNAM personal that lead to the cration of spin-offs.

To encourage the participation of UNAM academics in innovation projects, and the protection of the technologies that are developed, CID established an award since 2010 called Programa de fomento al patentamiento y la innovación (PROFOPI).

In the 2015 emission of PROFOPI, 33 patent applications participated in the contest. All of them were evaluated on the basis of their innovation and commercial potential by one IMPI evaluator and two independent entrepreneurs, working in the field of knowledge to which the invention belongs. The following patent applications that were filed to IMPI were awarded:

*First place:* "New water-soluble compounds derived from bencimidazol, useful in the treatment of fasciolosis" Dr. Rafael Castillo Bocanegra. Facultad de Química.

*Second place:* "Nanostructured systems as thermal protectors of functional ingredients in food and dietary-supplements ". Dr. David Quintanar. FES Cuatitlán.

*Third place:* "DNA macroarrays to detect enteropathogenic microorganisms in environmental samples" Dra. Valeria Souza Saldívar. Instituto de Ecología.

*Fourth place:* "Antioxidants micro-encapsulation by spray dying using Opuntia focus indica and Aloe vera mucilage" Dr. Antonio Spanchez Solís. Instituto de Investigación en Materiales.

*Fifth place:* "Analog compounds of phenetylic ester of caffeic acid, and use of the same for the preparation of pharmaceutical compositions for cancer treatment and prevention" Dr. Enrique Ramón Ángeles Anguiano. FES Cuatitlán.

*Fifth place:* "Use of micro-algae for increasing the survival in the early stages of the life cycle of Queen conch (Lobatus (= Strombus) gigas) cultures" Dra. Anastasia Teresa Banaszak. Instituto Ciencia del Mar y Limnología.

In summary, in the area of innovation and technology transfer, UNAM has still to enhance its impact in the Mexican Society, but having CID as a coordinator of the activities in this area has proven to be a good strategy towards the achievement of this goal

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