Past and Future of UNAM

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While many scientists have dealt with nanoscale problems for half a century, nanotechnology has become subject of interest after a NATO Scientific Workshop on low dimensional systems held at Biaritz in 1994 organized by Dr Leo Esaki, a Nobel Laureate in physics. Ten Nobel Laureates and several scientists who contributed to this workshop agreed on that nanotechnology will be crucial for our future. The outcome of that workshop drew attention of various authorities of science and technology. Meanwhile, along the suggestions of economists seeking new and high-value-added technologies, President Clinton announced Nanotechnology as the high priority research field of the United States. Since then nanotechnology has become a new technology revolution, which will dominate the 21st century.

Having served in European adhoc committees launching nanotechnology research programs in the European Union, and having spent one year in the USA in the panels related with nanotechnology, I had an opinion that the research on nanotechnology needs a thorough support in Turkey. To this end, Professor Ali Doğramacı, the rector of Bilkent University, my colleagues and I did every attempt to explain to the authorities the important role that nanotechnology may play for the future of Turkey. The State Planning Organization (SPO) responded to our proposal for setting up a national research center on nanotechnology by granting 11 millions TL at the end of 2005. This way, SPO has given birth to UNAM. Bilkent University committed to provide additional support by matching equivalent of 1/3 of the financial support provided by SPO.

During the initial planning period,, we decided to reconsider the size and scope of the project. In fact, we realized that similar centers abroad have much larger scope and size. With the encouragement and continuing support of Professor Orhan Güvenen, former undersecretary of the State Planning Organization, we decided to include chemistry, materials science, spintronics, nanobiotechnology, nanotextile and energy in addition to physics, photonics and nanoelectronics set initially as fields of study of UNAM and increased the budget of the total investment to $120 million. Moreover, we clarified the concept and scope of “a national center”, and decided that UNAM will be

organized to operate as a center of excellence in nanotechnology in Turkey. Under these circumstances, our mission and vision have also been revised.

The financial needs to set up a state-of-the-art national research center in nanotechnology, in particular construction of the building comprising all research infrastructure have been provided by Professor İhsan Doğramacı, the founder of Bilkent University, whose vision has guided UNAM project to success.

The planning stage of UNAM and its facilities have been finalized in the first half of the 2006 with the collaboration of a few project engineers and scientists under my coordination. It should be noted that such a huge project with estimated budget of $120 million has to be planned in a longer period of time through dedicated work of a large group of engineers and scientists, with technical assistance of different consulting agencies. Unfortunately, we did not have time and financial resources to carry on with this ideal planning stage. Ironically, my past experience in Turkey is that the longer the planning phase, the higher the risks of failure due to the intervention of the outsiders! Nevertheless, the projecting stage was accomplished in a short time, while the project is modified several times to meet new conditions and to provide further space and to minimize the costs of construction. Upon received necessary official approvals, the construction started effectively in June of 2006. On this occasion, I would like to thank Architect Ramiz Akgül, Head of Construction Department, for his continuing support. Photos taken at various stages of the construction demonstrate how the UNAM building had been rising at the former parking lot of Faculty of Science.


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As construction of the UNAM building progressed, UNAM team showed an exceptional performance to select the necessary equipments for research laboratories. To this end, several researchers working in other well-known Nanotechnology Centers abroad were consulted. As a strategy, we decided to first procure basic equipments, which do not exist in other research institutions in Turkey. UNAM team members selected the most suitable suppliers among world- renowned makers or

suppliers, as far as capacity and price of the equipment. Here I would like to mention dedication and success of Assistant Professor Mehmet Bayındır in the procurement and installation of the basic equipments and efforts of the personel of Purchasing and Finance Department of Bilkent University. I would like to extend my gratitudes, in particular, to Dilek Bilgili, Serdal Elver and Adnan Baser.

Parallel to the construction and equipment procurements, my colleagues and I also planned a new interdisciplinary graduate program named as, Materials Science and Nanotechnology (MSN). The aim of this program was to train students, who will carry out the research work in UNAM Laboratories. The MSN graduate program is attracting outstanding students.

Except for the clean room facilities and auditorium, the construction of UNAM building, was finalized at the end of 2007. Administrative and technical personnel and MSN students moved to the new UNAM building and started to operate the research facility. The project activities until this stage was identified as the first phase of the project, and finalized with a total investment of effective value of 28 millions TL.

With the aim of providing further financial support to expand UNAM facilities, researchers from Bilkent University proposed several research projects to various institutions, such as SPO and TÜBİTAK. Towards the end of 2007, SPO has changed its strategy and launched a new program to support research infrastructures and research centers rather than individual research projects. In this context, rather than supporting individual research projects proposed earlier by UNAM's researchers in 2006 and 2007, SPO decided to grant financial support to UNAM to further strengthen and complete the research infrastructure built during the first phase. To his end, 30 millions TL has been granted for three years under the second phase of UNAM Infrastructure Project, while 10 millions TL committed by Bilkent University. With the onset of the second phase in May 2008, UNAM has committed to SPO to open its research facilities to all users. Our investments are progressing to reach to the effective value of 60-70 millions TL by the end of 2009.

According to our short term plans, a 400m^2 clean room comprising class 1000, 100 and 10 areas and state of the art equipments will be operational in June 2009. Our main characterization laboratories are expanding with additional equipments. While research in our Supramolecular Chemistry and Biomimetic Materials Laboratories are progressing, Nanotextile Laboratory is being established to be operational before June 2009. Other research laboratories such as materials science, materials chemistry and nanobiotechnology will be established before September 2009. Twelve researchers with Ph.D. degree are working full time in UNAM together with more than 200 users from Bilkent University and other institutions as of the beginning of 2009. The numbers of users are augmenting rapidly. Another major activity of UNAM will be a wide range of research in solar energy including inorganic and organic PVs and concentrators. Also UNAM will establish its management information system, comprising user scheduling, project control, accounting, operations and maintenance, lab-

safety, purchasing, and stock control etc. Units in our organization chart will be operational and further developed by assigning new members for different committees, such as Committee for Associate Members, Strategic-Economic and Industrial Committee, Scientific and Technological Committee.

In summary, UNAM is developing as a national research facility and center of excellence in nanotechnology, where our research laboratories equipped with state-of-the-art equipments are operational for 24 hours under the surveillance of expert technical personnel. Users, who are trained to operate research equipments by themselves, can carry out their own research work in UNAM. The experts in UNAM can also provide them technical assistance. This concept of operation and being a national user facility can save a lot of resources and promote research in Turkey.