

## Boosting biomedical research in the Arab world

In 2007, the Arab world spent just 0.2% of its gross domestic product (GDP) on research and development (R and D), half the rate in Africa, according to the United Nations Educational, Scientific and Cultural Organization's (UNESCO) 2010 Science Report. By comparison, Europe spent 1.6% of its GDP on R and D in 2007 and China spent about 1.4%. Arab countries currently produce less than 1% of all citations in the world and contribute less than 0.5% of papers appearing in the 200 leading medical journals.<sup>[1]</sup> Other than dearth of funding, poor institutional support, lack of integration within the international scientific community, as well as conflicts and instability have been implicated in the current unfavorable situation of research in Arab societies.<sup>[2]</sup>

Still, a major barrier to science in the Arab world lies in the weakness of democratic institutions. At the societal level, broad-based science cannot flourish without an atmosphere of freedom and security, and scientists usually thrive on the free flow of information and ideas. Wealthy and relatively stable Arab countries of the Gulf region for example, which are making considerable investments in science and research, do not fare much better in terms of high-quality research output compared with poorer Arab countries. Connecting with international partners and the ability to forge international collaboration moreover, a very important condition for science to flourish, are sometimes hindered by Arab authorities' pathological concern about everything "foreign." Furthermore, Arab leaderships for most part do not genuinely believe in science as the way to development, and consider owning technology as a synonymous to acquiring it. At times, they are enchanted with the technological development of the west, but still think that they can somehow bypass the underlying historical thought process of enlightenment and freedom that fostered the cultivation of scientific inquiry<sup>[1-3]</sup>.

At the institutional level, higher scientific institutions in many Arab countries, the natural curator of scientific research, are mostly governmental. This translates in undemocratic systems into these institutions being more structured along political lines than scientific ones. This fact influences many aspects of academic life, by removing any merit-based incentives for faculty and students and by rendering qualifications and performance of little importance for faculty evaluation and promotion.<sup>[4]</sup> This situation is not expected to change soon because it creates a vicious cycle, where lack of merit-based promotion of faculty will not allow professionals who understand research and its requirements to reach leadership positions and lead positive change in their institutions. Many private institutions suffer from the same dynamics, but mainly because of weakness of national and regional accreditation bodies and the ambiguity or lack of unified criteria for the assessment and rating of academic excellence. As a result, many Arab higher institutions lack some basic requirements of research, such as institutional review boards, financial units that can deal with external funds, research and grants support, or even the capability to communicate effectively and timely with their counterparts internationally.<sup>[1-4]</sup>

The paper by Diab and colleagues in this issue of *Avicenna* is a clear illustration of the crisis of biomedical research in an Arab country, Syria. It shows that major governmental universities produce little research relative to their large size and resources compared with smaller institutions that are not under direct control of governmental bureaucracy. The Syrian Center for Tobacco Studies (SCTS) is a very good case study in this regard.<sup>[5]</sup> Established in 2002, this research entity, built on the auspices of non-governmental organization (Syrian Society Against Cancer), has out-produced institutions with 100-times more staff, students, and resources in terms of high-quality biomedical research. The formula for this success is simple; the SCTS is made of professionals who understand what is needed to create a productive research environment, has some autonomy, and was successful in competing for international research funding.

Changing the scientific landscape of Arab countries will require changes in the broader societal environment that fosters and protects freedom of inquiry, as well as changes

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in academic institutions' culture that rewards merit and adopts fair and clear process for evaluation and academic excellence. As the winds of democratic change sweeps the Arab world, let us hope that they bring with them the seeds of free scientific inquiry and greater investment and support for science and development.

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