

Opportunities for Production of Affordable Biosimilar Medicines, and Plant-Based Novel Therapeutics, in the Islamic World

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Generic medicines - exact synthetic copies of novel small-molecule drugs - are widely used in Islamic countries because of their low cost and reliability. A substantial amount is sourced from developing countries including some in the Islamic world. Bangladesh exports high quality and inexpensive generics to about 130 countries, including 19 low income countries in the Islamic world. However, the pipeline of new small-molecule drugs, from which generic medicines are copied, have almost dried up as multinational drug companies have almost exclusively turned their attention to a new class of very efficacious protein-based pharmaceuticals (**Biologics**). The earlier versions of Biologics were human enzymes, hormones, growth factors and cytokines produced by recombinant DNA technologies. The latest versions are monoclonal antibody (Mab)-type molecules. These new generation of life-saving drugs are extremely expensive (at least \$ 50 thousand/patient/pa) and simply beyond the means of most people and poorer countries of the developing and Islamic world. There is, therefore a huge demand for the production of cheaper versions of these wonder drugs, termed **Biosimilars**, through reverse-engineering and recombinant DNA technology. As most Mab-type Biologics are under patent, copying them into Biosimilars is problematical. Luckily LDCs are exempt from patent restrictions till 2032, and are free to copy and produce any drug on the market irrespective of their patent status. At least one country in the Islamic world that falls in that category, Bangladesh, has already developed the technological capacity to produce these new Biosimilars and could potentially supply these at an affordable price to the Islamic countries.

A very promising area of drug discovery and development, where Islamic countries can productively collaborate, is through “**rational**” **bioprospecting of the Biota**. Many Islamic countries, including Bangladesh, are endowed with diverse hotspots of unique flora and fauna, and rich traditional medicine systems. Ethno-pharmacologists and medicinal chemists in the Islamic world have been very prolific in publishing scholarly research articles, but relatively little of this has translated into scientifically-verified safe and efficacious modern drugs. Natural products-based drug research would be greatly enriched by additional involvement of molecular bioscientists studying the molecular basis of disease pathogenesis, and the starting point in drug development could be the **discovery of new lead compounds** (and potential IP) from using simple **disease-specific molecular target-based bioassays** to screen secondary metabolite libraries (extracts or isolated chemicals).

The above two areas of pharmaceutical research have huge potential in the Islamic World through multinational and multidisciplinary collaborations between research groups possessing complementary expertise and facilities. Many resource and technology poor Islamic countries, with valuable human and intellectual capital, must be provided the opportunity to contribute to competitive research that benefits them and the Islamic world. Pharmaceutical and biotechnology research in the Islamic world would greatly benefit from access to cutting-edge technologies and uniform and common IP and regulatory guidelines. COMSTECH, with support from IsDB, could play a catalytic role by enabling and coordinating the development of world-class Biomolecular research capacity in OIC-member countries
