

Translational Biomedicine as a Soul for Doctors

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Editorial Note

Translational medicine results from collaborations between clinics, research hospitals, governments, academics, and small to large scale industry where diseases (infectious, acquired, or genetic) are identified, candidate therapeutics optimized and tested in cell culture, humanized small animal models, and in clinical trial. The goal of translational medicine is to bring to market safe and effective therapeutics in a timely and cost efficient manner. However, clinician/scientists critically trained in translational research are few and more programs to foster their development are required. Herein the state of translational medicine in leading countries (UK, Netherlands, Austria, Singapore, China, Australia, Japan, India, Malaysia, South Korea and the United States) as well as joint EU efforts is described. A summary of programs, research projects, funding agencies, national support levels and unique opportunities within each nation are presented. The future of translational medicine and interagency collaborations is promising, provided highly trained translational medicine experts can be trained. That is to produce translational leaders that engage the patient, the laboratory, industry and government.

The goal of translational medicine is to expedite the development of newly identified compounds to enhance the patient's quality of life. Translational medicine is the synergy between epidemiology, basic research and clinical trials. Translational medicine is the successful application of translational research. Both translational medicine and research are relative newcomers to clinical medicine, not significantly mentioned in peer-reviewed articles prior to year 2000. Since their appearance, interest in both translational research and translational medicine has increased, with translational research driving translational medicine.

Evidence-Based Medicine

Translational medicine codifies evidence-based medicine into

three basic areas. First, a dynamic exchange is established between the physician and the basic scientist where the clinical question is posed, discussed and focused research is initiated to yield candidate targets for treatment.

The dynamic exchange matures to include the commercial sector where potential therapeutic targets are optimized, in some cases employing high throughput peptide, small molecule, phage display libraries, and candidate molecules are brought to clinical trial. At this point, the circle is completed; clinic to bench to clinic. Multicenter clinical trials are expensive in time, labor and money, but necessary to generate safe and useful treatments.

The UK has one of the excellent translational medicine (TM) systems in EU. Two types of biomedical research centres are playing critical roles for advancement of Translational research in the country i.e., Comprehensive BRCs and Specialist BRCs. Comprehensive BRCs address a broad spectrum of topics and total five in number.

While, Specialist BRCs are seven in total and are more focused on one specific research area. These centers have boasted translation research in the country which is evident by increase in total number of clinical trials numbers i.e., 290 in 2005; have risen to more than 850 in 2009- 10. Many UK universities are offering TM related programs at various levels including postgraduate certificate, master and PhD studies.

The Wellcome trust along with industrial partners have established translational medicine and therapeutics programs in various institutes which are offering rigorous basic and clinical science research training. STMTI (Wellcome Trust Scottish Translational Medicine and Therapeutics Initiative) is collaboration between the four Scottish academic medical centres to prepare a team of academic clinicians with expertise in translational medicine and therapeutics. STMTI is funded by the wellcome trust and industry.