Translational investigation: its essence, opportunity and merit

Investigação translacional: a essência, a oportunidade e o mérito

Orlando de Castro e Silva[1], Nathalia Machado Cardoso[2]

1. Full Professor, Head of the Department of Surgery and Anatomy, Faculty of Medicine of Ribeirão Preto, University of São Paulo (FMRP-USP), Ribeirão Preto-SP, Brazil.
2. Undergraduate Medical student and Monitor of the Digestive Surgery Division, Department of Surgery and Anatomy, FMRP-USP, Ribeirao Preto-SP, Brazil

New generation treatments and surgical procedures arise from research carried out at the academic level and in industrial laboratories. Thus, work performed in the laboratory can develop a therapy applied to clinical practice or a new surgical technique that can be applied to humans. This bench to bedside scenario describes the essence of translational research, i.e., it translates basic laboratory discoveries into practical clinical applications. Nevertheless, the ideas tested in clinical practice often do not become efficient, requiring future refinement.[1,2] Thus, clinical results can also return to the laboratory in order to help improve and refine a therapeutic strategy, so that translational research uses the bench to bedside approach in a bidirectional manner.(Figure 1)

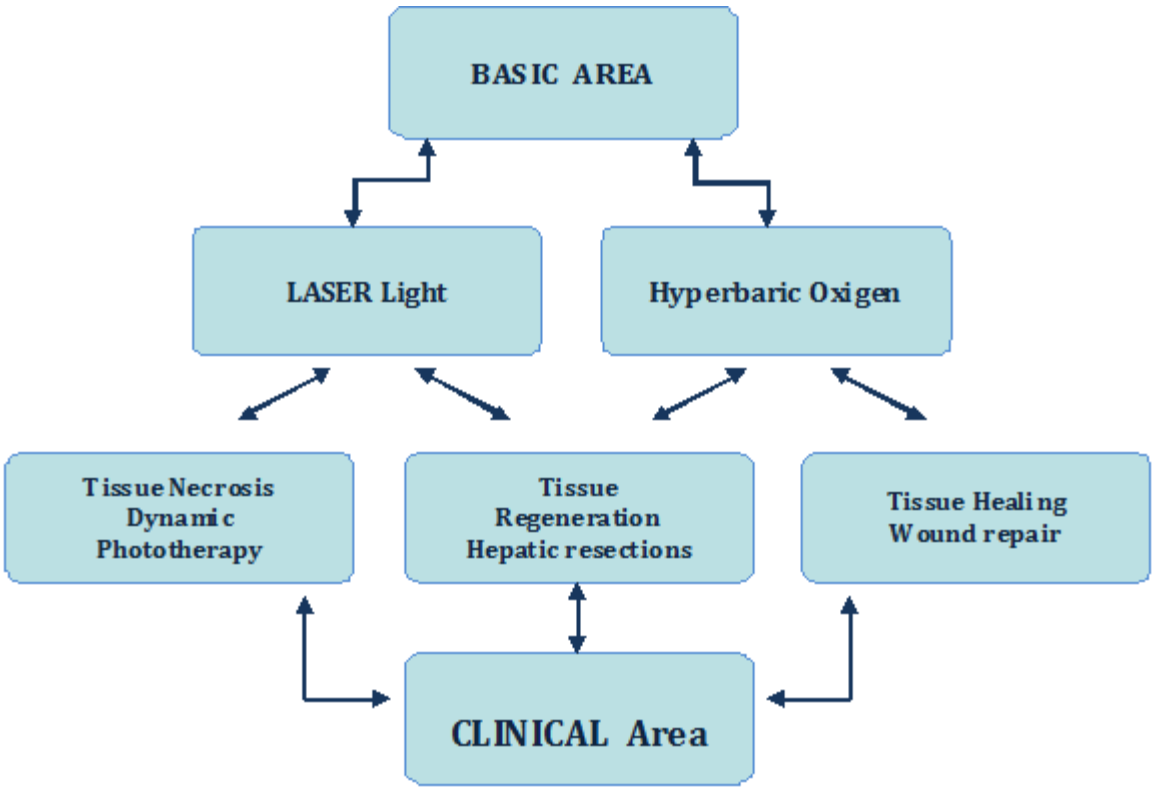

Figure 1. Steps of translational research

Medicina (Ribeirão Preto) 2012;45(4):409-10
http://revista.fmrp.usp.br

There is no doubt that translational research is based on research in basic science, and the question that arises is to what extent there is failure to apply the knowledge acquired. There is a perception that an enormous effort is being devoted to biomedical research and to the understanding of disease mechanisms but that this extensive work does not result in effective gains regarding new treatments, diagnostic methods and preventive policies.

Over the last 30 years, the focal points of clinical and basic research have followed different paths, with a distance between bench and bed that can be understood as a profound abism between them which investigators in the basic area, busy with research, and clinical investigators, busy with patient care, are not always encouraged to cross. In reality, what is missing is communication or interaction between these two poles as if they were a single entity in the form of a team of scientists. Translational research arises as a bridge between these two poles, previously clearly separated. In 2003 the US announced the creation of 60 Clinical and Translational Science Centers (CTSCs) funded with an annual budget of 500 million dollars to be shared by universities and medical centers throughout the country.[1]

Translational research has been encouraged by investment in training, research and infrastructure in order to help investigators to become involved in clinical research. It was believed that this would break down barriers and lead research from bench to bed and permit additional investigation of topics involving human beings and also samples that would generate hypotheses more relevant for persons than for animal models.[3]

The common understanding is that medical research in a department or in an area of clinical or surgical activity should occur in an eminently applied manner, without aspects of pure inquiry. In contrast to basic investigation, which is virtually limited to the understanding of pathological processes, experimental clinical research is practical or even pragmatic. However, with the advancement of knowledge and the need for multidisciplinary and team work, modern investigation acquires a very special characteristic, i.e., it is performed in such a way that inquiry and application will occur in a synergistic translational manner from the basic to the clinical plane and vice versa.[2]

Despite the vast theory created around an ideal model of translational research, some challenges must be met for a successful development of this project. Among the difficulties pointed out, we may emphasize that: basic-biomedical research has its own dynamics, with promotions and rewards mostly based on the quantity of papers published in renowned journals and not on the contribution made to the advancement of medicine and many academic physicians of the clinical areas, who treat patients, have little time or inclination to continue to develop the complex basic literature. These two points evidently reduce the movement of knowledge and of the hypotheses generated between the two poles, i.e., from bench to bed and vice versa.

It would be interesting and opportune to create a study and research group, even within the same clinical-surgical Department, involving undergraduate and graduate students in the basic and clinical areas under the tutoring of professors geared for both areas, thus reducing the distance between bench and bed by transforming it into a virtual distance. It can be clearly seen that research on a team basis is a common practice at FMRP, moving properly within this space by asking, replying and confortably translating between bedside and bench, representing the great merit of our medical school.

References

1. Butler D. Crossing the Valley of death. Nature. 2008; 453:840-2.
2. Castro e Silva O. Surgery from experimental research to clinical application and vice-versa. Acta Cir Bras, 2006; 21suppl 1:1-2.
3. Bagnato VS, Kurachi C, Castro-e-Silva O. New perspectives for optical techniques in diagnostic and treatment of hepatic diseases. Acta Cir Bras. 2010; 25:214-6.