

From basic research to clinical application

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Background and Introduction:

To make a success of a translation research, several requirements must be joined together. Initially, a geographical situation and a local political conjunction which place at the disposal the high essential technological schools, infrastructures specialized and for the medical field a teaching hospital or equivalent. There must be a political good-will and a governorship to stimulate the blossoming of such project. It is not enough to want to make translation research, it is necessary to have the organizational means of them. The caricatured situation of the high school of technology which develops ideas on its side and which sees appearing a possible application in the field of health is not any more topicality. Indeed, social and economic requirements require a quasi-tripartite management of the projects. There are the world of technological sciences, the world of medical sciences and the concept of public health which introduces dimensions not only economic but such ethical and social.

The Facts

The story of the university orthopedic and traumatology department is remarkable. At the beginning there is more than 20 years, it is the medical world, which on the pressure and the passion of its Head of current department pushed a form of collaboration with the engineers of EPFL. The first projects of medical or anatomical nature parasitized the finite element analysis and research laboratories in the objective to support the comprehension of articular biomechanics. This very technical work led to many fundamental results of order. Little by little the pressure and enthusiasm, this time common, made it possible to widen the field of research and to associate a biological dimension gradually there. A paradox is observed, medicine sought technological answers and the mixture of the ideas results little by little in creating a group whose studies lead to a technobiological concept.

By way of example the analysis of articular biomechanics by the finite elements naturally resulted in being interested in the articular implants, then with the interface of the these implants with bone tissues. The following stage was the modeling of the reaction of the bone to

these implants. Thereafter, will to include/understand the biological reaction (gene expression) of the bone to thorough the researchers (physicist) to direct itself towards again scientific horizons of the biological world. So gradually a well-defined structure - the institute of research in orthopedics could take shape on the level institutional. Its perennially is ensured by under-groups which join together around the same project engineers and doctors. They work in concert forming and learning from each one.

Discussion and Conclusion:

Finally, the translation in the clinical world requires legal competences and of management of quality. These tools must be placed at the disposal by the institutional framework, if one wishes to make bear fruit and benefit the populations from our projections. And in this dimension, EPFL and Hôpital Orthopédique-CHUV bring to the level of the assistance to the technology transfer, intellectual property and the ethical commission the possibility of giving a realistic dimension to our projects.