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The overcoming of the outdated idea of traditional dentistry as a necessary step towards the new generation of highly skilled dentists

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EDITORIAL

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Introduction

Dentistry is a growing branch, belonging to medical sciences. The history of Dentistry is made of atypical mingling between clinicians, technicians, up to involve the barbers in the earliest modern times, when the regulations were subject to changing and variables related to different application of the laws.[1]

In this initial context, Dentistry was considered as a "minor branch" of Medicine. In fact, the reduced complexity of the anatomy of the oral cavity, as compared to sites such as abdominal aortic plexus or chest, was seen as an element that allowed the dentist to perform treatment with greater simplicity compared to other specialists of the medical sciences.

The development of dental science led to a deep reviewing of many branches of dentistry, such as Oral Implantology. In the 1960s, prostheses supported by early implants had a bad reputation, because of unpredictable clinical outcomes and lack of scientific culture based on the modern concept of "good clinical practice" and on the reproducibility of the techniques. The pioneer of modern implant dentistry is widely considered Professor P. I. Brånemark who started the era of osteointegrated implantology.[2]

The concept of "osteo-integrated implantology" has put a new light on topics such as bone biology, the topography of the implant surface, the bone-to-implant contact and many other concepts that today are considered the basis of modern dental implantology. In any case, the drastic improvement of dental implantology represents a declination of the broader innovation process that involved, and continues to affect, the modern dentistry. In fact, net growth of the skills required for optimal management of clinical patterns has occurred in all branches of Dentistry.

Endodontics, for example, is a branch that contemplates many points of interaction between the biology of the dental pulp and the physiology of the body: thus, a variation in the micro-environment of the pulp chamber, in response to a stress, mediated by inflammation sustained by bacteria, creates a variation of oxidative stress levels detectable at the systemic level.[3]

Endodontics, also, is the focus of studies on the regeneration of the pulp, through the use of stem cells from dental pulp (DPSCs). Since Stan Gronthos first isolated the DPSCs, many other research groups have focused their activities on the study of dental-derived stem cells for medical applications.[4–14] The research activities in dental field have developed tight collaborations between dentists, biologists and biotechnologists, aimed to carry out scientific results able to create innovative clinical applications and new insights inside the translational medicine.

The science of Biomaterials has become an ancillary aspect, with important implications on many aspects of current Dentistry, such as Regenerative medicine,[15,16] Oral pathology,[17] Oral and Maxillofacial surgery,[6,8] Dental prosthesis,[18] and many other related aspects. The same concept of biomaterial has undergone several changes, following the scientific literature: in fact, biomaterials, in the first surgical uses, were used as scaffolds to

mechanically fill a tissue defect. The scientific research has increasingly enlarged the concept of biomaterials towards the modern concept of biomimetic biomaterials, which includes the biomatrices made from platelet concentrates,[19,20] the bioactive biomaterials with functionalized surfaces,[10] the decellularized biomaterials made from extracellular matrix[11,15,16] and the 3D-printed biomaterials.[21,22]

Conclusions and Future Trends

The future trends see the dentist as a major player in the basic science and translational research. Slowly, the classical research topics, such as the studies on the implant shape, or the models on the distribution of masticatory loads, will be of minor impact on the scientific community, in order to give more space to topics such as tissue regeneration, or the enhancement of biological waste use in reconstructive surgery.[23]

The real challenge, today, is to understand these profound changes and to apply an interdisciplinary education that promotes the creation of the figure of “Dentist 2.0”.

Several research groups, within Italian universities, have correctly understood this trend, so they have invested in the human resources with a multi-disciplinary curriculum, thus promoting the growth of a new generation of dentists and researchers with high skills.

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PEER REVIEW

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CONFLICTS OF INTEREST

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