

EDITORIAL

Old Concepts, Current Knowledge, New Challenges

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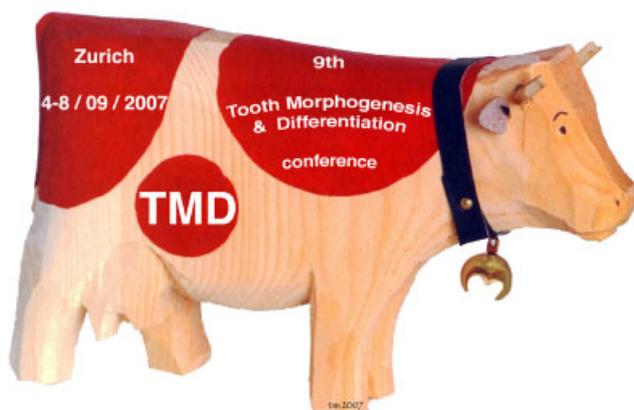
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This Special Issue contains papers presented at the 9th international conference “Tooth Morphogenesis and Differentiation” (TMD), organized in 2007 in Zurich, Switzerland. The papers cover a broad spectrum of topics such as craniofacial evolution and genetics, tooth development, molecular mechanisms in differentiation, mineralization and regeneration, stem cell applications, biotechnology and tissue engineering. It is 30 years ago that Professor Jean-Victor Ruch organized the first TMD conference in Strasbourg, France. At that time, he did this with the help of a small group of colleagues heartily devoted to this “marginal” field of research. How “marginal” this research was considered, and how frustrated these researchers were, is best illustrated through an editorial in the Special Issue on “Odontogenesis” that appeared in 1995 in the *International Journal of Developmental Biology*. In this Issue, Guest-Editor Jean-Victor Ruch complained about two anonymous referees who let him know that the embryonic dentition was not of general interest to developmental biologists! Of course things have changed since then, and we do not have to justify ourselves every time we submit our work to scientific journals. Nowadays the tooth represents a very respected and well-appreciated model of organogenesis to all scientists. For sure, “teeth are more than a smiling or painful curiosity,” and we are all thankful to Professor Jean-Victor Ruch for his commitment to change irrevocably the ideas of biologists concerning the tooth. Since the first TMD conference, the number of participants continuously increased during the years, and inevitably TMD became an international conference. Participants meet every 3 or 4 years in friendly settings that provide critical, “state of the



9th TMD conference, Zurich, Switzerland, September 2007.



Logo of the 9th TMD conference.

art,” overviews and promote intense discussions and free-wheeling exchanges of ideas on topics of high importance to oral biology.

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The advent of genomics has profoundly changed many paradigms used to define health and diseases. While in the past the diseases were described only in histopathologic and anatomic terms, in our days they are described also in terms of gene mutation. Gene therapy could open new horizons for the treatment of any kind of disease. Molecular biology has significantly increased our understanding of the mechanisms that take place in cell plasticity, pathology and regeneration. Tissue engineering is an area that has greatly profited from molecular biology. Tissue engineering techniques allow the replacement of damaged or lost tissues/organs by new ones. Different approaches that combine biomaterials, biologic molecules and cell transplantation techniques are used for the growth or

regeneration of a given tissue/organ. These developments that have as their aim the regeneration of dentin, enamel, dental pulp, and periodontium will have a marked impact on dentistry. The increased knowledge on craniofacial and tooth development, growth, homeostasis, pathology and repair will cause a significant shift in which scientists will be able to translate basic research findings into daily practice techniques.

I wish to thank the authors for their contribution to this Special Issue. This Issue provides vivid proof that the tooth model is of broad interest and deserves a prominent "place in the sun." Further progress in craniofacial and dental treatments depends upon continued active and vigorous research programs in our field.