

## Departments

### EDITORIAL

#### Our Evolving Journal

W.V. Giannobile

This editorial introduces the new journal style and coming attractions of the *Journal of Dental Research* in 2015.

5

### INVITED PERSPECTIVE

#### What Are the Cancer Risks from Dental Computed Tomography?

P.P. Hujuel, J.K. Aps, and A.-M. Bollen

This perspective critiques the evidence-based approach to diagnosis as it relates to ionizing radiation, and highlights Wu et al. from this issue

7

## Reviews

### CLINICAL REVIEW

#### Socioeconomic Inequality and Caries: A Systematic Review and Meta-Analysis

F. Schwendicke, C.E. Dörfer, P. Schlattmann, L. Foster Page, W.M. Thomson, and S. Paris

The authors present a systematic evaluation of the association between socioeconomic status and caries prevalence, experience, or incidence.

10

## Research Reports

### CLINICAL

#### The Interplay between Socioeconomic Inequalities and Clinical Oral Health

J. Steele, J. Shen, G. Tsakos, E. Fuller, S. Morris, R. Watt, C. Guarnizo-Herreño, and J. Wildman

The authors describe why the rich and the poor have different oral health outcomes, how this difference manifests throughout the stages of life, and why the oral health measurement of choice per age group matters in this context.

19

#### Predicting Cancer Risks from Dental Computed Tomography

T.-H. Wu, W.-C. Lin, W.-K. Chen, Y.-C. Chang, and J.-J. Hwang

Extremely low radiological exposure is associated with a non-negligible lifetime-attributable risk for cancer among most dental implant patients.

27

#### A 5-Year Randomized Trial to Compare 1 or 2 Implants for Implant Overdentures

S.R. Bryant, J.N. Walton, and M.I. MacEntee

The authors present a 5-y randomized clinical trial of mandibular implant overdentures retained by 1 or 2 implants.

36

#### Understanding Treatment Effect Mechanisms of the CAMBRA Randomized Trial in Reducing Caries Increment

J. Cheng, B.W. Chaffee, N.F. Cheng, S.A. Gansky, and J.D.B. Featherstone

The authors show CAMBRA significantly reduced 12-month overall risk and 24-month DMFS index increment, indicating a greater intervention effect of combined action on multiple aspects of the caries process.

44

#### The Molecular Basis of Hereditary Enamel Defects in Humans

J.T. Wright, I.A. Carrion, and C. Morris

Using a search strategy based on the Online Mendelian Inheritance in Man database, the authors review the molecular basis for the development of enamel defects in humans.

52

### BIOMATERIALS & BIOENGINEERING

#### Restoration Materials and Secondary Caries Using an In Vitro Biofilm Model

N.K. Kuper, F.H. van de Sande, N.J.M. Opdam, E.M. Bronkhorst, J.J. de Soet, M.S. Cenci, and M.C.D.J.N.M. Huysmans

In this in vitro study, the authors investigated the influence of different dental restorations materials and adhesives on the secondary caries development in gaps, using a biofilm model.

62

#### Effects of Hypoxia on the Immunomodulatory Properties of Human Gingiva-Derived Mesenchymal Stem Cells

C.M. Jiang, J. Liu, J.Y. Zhao, L. Xiao, S. An, Y.C. Gou, H.X. Quan, Q. Cheng, Y.L. Zhang, W. He, Y.T. Wang, W.J. Yu, Y.F. Huang, Y.T. Yi, Y. Chen, and J. Wang

The authors have demonstrated that hypoxia promoted the expression of FasL and the production of IL-10 of hGMSCs, contributing to the promotion of hGMSC-based immunomodulation.

69

#### Biochemical Indicators of Implantation Success of Tissue-Engineered Oral Mucosa

S. Kuo, Y. Zhou, H.M. Kim, H. Kato, R.Y. Kim, G.R. Bayar, C.L. Marcelo, R.T. Kennedy, and S.E. Feinberg

The authors concluded release of VEGF, IL-8, hBD-1, and TIMP-1 and -2 into stressed and unstressed EVPOMEs can be used as a non-invasive predictor of healthy tissue-engineered EVPOMEs prior to their implantation.

78

#### Role of Interstitial Fluid Pressurization in TMJ Lubrication

B.K. Zimmerman, E.D. Bonnevie, M. Park, Y. Zhou, L. Wang, D.L. Burris, and X.L. Lu

The authors examine the measurement of friction coefficients and the role of interstitial fluid pressurization in the lubrication of the TMJ disc and condylar cartilage.

85

### BIOLOGICAL

#### Proteoglycan Expression Is Influenced by Mechanical Load in TMJ Discs

Y. Nakao, M. Konno-Nagasaka, N. Toriya, T. Arakawa, H. Kashio, T. Takuma, and I. Mizoguchi

The authors indicate that mechanical loading differentially influences proteoglycan mRNA expression and protein accumulation in the TMJ disc.

93

# Research Reports (continued)

- Early Dental Epithelial Transcription Factors Distinguish Ameloblastoma from Keratocystic Odontogenic Tumor** 101  
*K. Heikinheimo, K.J. Kurppa, A. Laiho, S. Peltonen, A. Berdal, A. Bouattour, B. Ruhin, J. Catón, I. Thesleff, I. Leivo, and P.R. Morgan*  
 The authors present a genome-wide comparison of ameloblastoma and keratocystic odontogenic tumors.
- Contribution of Donor and Host Mesenchyme to the Transplanted Tooth Germs** 112  
*T. Nakaki, K. Saito, H. Ida-Yonemochi, E. Nakagawa, S. Kenmotsu, and H. Ohshima*  
 This study characterized the healing of allogenic tooth grafts in a model based on GFP-labeled donor/host postnatal mice and labeled putative stem cells before transplantation.
- Excess NF- $\kappa$ B Induces Ectopic Odontogenesis in Embryonic Incisor Epithelium** 121  
*J. Blackburn, K. Kawasaki, T. Pomtaveetus, M. Kawasaki, Y. Otsuka-Tanaka, Y. Miake, M.S. Ota, M. Watanabe, M. Hishinuma, T. Nomoto, S. Oommen, S. Ghafoor, F. Harada, K. Nozawa-Inoue, T. Maeda, R. Peterková, H. Lesot, J. Inoue, T. Akiyama, R. Schmidt-Ullrich, B. Liu, Y. Hu, A. Page, Á. Ramírez, P.T. Sharpe, and A. Ohazama*  
 Excess NF- $\kappa$ B pathway activity induces an ectopic odontogenesis program that is usually suppressed under physiological conditions.
- Enhanced M1/M2 Macrophage Ratio Promotes Orthodontic Root Resorption** 129  
*D. He, X. Kou, Q. Luo, R. Yang, D. Liu, X. Wang, Y. Song, H. Cao, M. Zeng, Y. Gan, and Y. Zhou*  
 The alteration of M1/M2 macrophage ratio affects orthodontic root resorption. Enhanced M1/M2 ratio promotes orthodontic root resorption, while reduced M1/M2 ratio partially rescues it.
- Notch Signaling Induces Root Resorption via RANKL and IL-6 from hPDL Cells** 140  
*J. Kikuta, M. Yamaguchi, M. Shimizu, T. Yoshino, and K. Kasai*  
 Notch stimulates orthodontically induced inflammatory root resorption in periodontal ligament cells.
- Proresolving Nanomedicines Activate Bone Regeneration in Periodontitis** 148  
*T.E. Van Dyke, H. Hasturk, A. Kantarci, M.O. Freire, D. Nguyen, J. Dalli, and C.N. Serhan*  
 The authors use proresolving nanomedicines containing a novel lipoxin analog to promote regeneration of bone and soft tissue lost to inflammatory disease in a large-animal model of chronic periodontitis.
- Blocking VEGF Signaling Delays Development of Replacement Teeth in Zebrafish** 157  
*J. Crucke and A. Huysseune*  
 This study elucidates the role of the vasculature during continuous tooth replacement in zebrafish.
- LPS Induces Pulp Progenitor Cell Recruitment via Complement Activation** 166  
*F. Chmielewsky, C. Jeanneau, P. Laurent, and I. About*  
 The authors bring new data on dentin-pulp regeneration, especially on the interaction between complement systems, pulp fibroblasts, and progenitor cells.
- Dual Role of Autophagy in Lipopolysaccharide-induced Preodontoblastic Cells** 175  
*F. Pei, H. Lin, H. Liu, L. Li, L. Zhang, and Z. Chen*  
 LPS-induced autophagy may play a prosurvival role in the early stage but lead to cell death in the late stage in the mDPC6T cell line.
- TLR2 Promoter Hypermethylation Creates Innate Immune Dysbiosis** 183  
*M. Benakanakere, M. Abdolhosseini, K. Hosur, L.S. Finoti, and D.F. Kinane*  
 The authors investigate epigenetic control of innate immune function in human gingival epithelial cells and susceptibility to periodontitis.
- Saliva Suppresses Osteoclastogenesis in Murine Bone Marrow Cultures** 192  
*J. Caballé-Serrano, B. Cvíkl, D.D. Bosshardt, D. Buser, A. Lussi, and R. Gruber*  
 Saliva suppresses osteoclastogenesis toward a phagocytic phenotype in murine bone marrow cultures.
- Iron Binding Modulates Candidacidal Properties of Salivary Histatin 5** 201  
*S. Puri, R. Li, D. Ruszaj, S. Tati, and M. Edgerton*  
 The authors examine how metals in saliva affect the activity of salivary antimicrobial protein histatin 5 to highlight the field of salivary metallomics and how metals in saliva may contribute to oral health.
- Acetylsalicylic Acid Treatment Improves Differentiation and Immunomodulation of SHED** 209  
*Y. Liu, C. Chen, S. Liu, D. Liu, X. Xu, X. Chen, and S. Shi*  
 Aspirin treatment improves stem cell functions of SHED, including upregulating proliferation, osteogenesis, and immunomodulation by elevating telomerase activity.
- TRAIL-Expressing Gingival-Derived Mesenchymal Stem Cells Inhibit Tumorigenesis of Tongue Squamous Cell Carcinoma** 219  
*L. Xia, R. Peng, W. Leng, R. Jia, X. Zeng, X. Yang, and M. Fan*  
 G-MSCs were used as cell-based vehicle and transduced with full-length TRAIL and eGFP reporter genes by lentivirus, and the anti-tongue squamous cell carcinoma effect of engineered G-MSCs was evaluated.

## LETTERS TO THE EDITOR

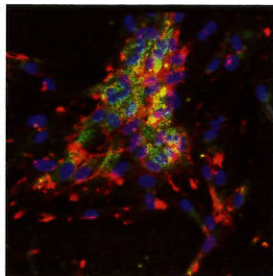
- Letter to the Editor, "BET Inhibitor JQ1 Blocks Inflammation and Bone Destruction"** 229  
*S.J. Hogg, R.W. Johnstone, and J. Shortt*
- Response to Letter to the Editor, "BET Inhibitor JQ1 Blocks Inflammation and Bone Destruction"** 230  
*S. Meng, Q. Tu, D. Murray, and J. Chen*

## CORRIGENDUM

231

## CLASSIFIEDS

232-inside back cover



## ABOUT THE COVER

Dental pulp cell characterization and immunofluorescence triple staining was used to visualize mesenchymal stem cell markers. Expansion of STRO-1 sorted cells expressed both the mesenchymal stem cell marker STRO-1 shown by green fluorescence and the stem cell marker CD105 displayed by red fluorescence. Nuclei are counterstained with DAPI in blue.

For more details, see pages 166-174.