

The Symposium Honoring Dr. Steven Offenbacher: Four Decades of Research Contributions to Periodontal Medicine

We are pleased to publish this supplement to the *Journal of Periodontology* honoring the remarkable career and contributions of Steven Offenbacher to the field of periodontology and to the broader discipline of dentistry. The Symposium was held October 4, 2019 at the University of North Carolina at Chapel Hill and included many of Steve's close colleagues and former graduate students. The Symposium was organized by Jim Beck, a long-time friend and Steve's collaborator on 30 years of research projects. All of the attendees clearly recognized that we had lost much too early a dear friend, collaborator, and great contributor to our profession.

The supplement focuses on some key themes of a four-decade leadership in asking the question about what is this disease of periodontitis and is it really very simple or is it, in fact, very complicated? Along the way, Steve occasionally asked questions about how certain bacterial elements may influence the disease process, but otherwise he was driven by exploration of mechanisms. He thought about what seemed to influence initiation of periodontitis, what determined progression of disease, and what influenced the outcomes of periodontitis treatment. Most importantly, Steve spent many years with collaborators determining whether the common disease of periodontitis involved mechanisms that bridge to other diseases and therefore may have the potential to improve general health by appropriate management of certain cases of periodontitis.

Steve was prolific in his research and in his publications. We have highlighted below key research topics on which Steve focused in each decade as he progressed forward in his thinking. I apologize if we inadvertently did not include a few

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collaborators. A bibliography of Steve's peer-reviewed research indexed in MEDLINE follows the scientific papers in this supplement.

Prior to 1990, he collaborated extensively in part related to his training and opportunities to work with Max Goodson and Tom Van Dyke and to apply his background in **prostaglandins**. These collaborations involved neutrophil studies and **local drug delivery** projects with substantial excitement.

From 1990 to 2000, Steve started much of his work on **periodontitis and systemic diseases**. This work included **preterm delivery and low birth weight** outcomes, periodontal disease and **cardiovascular diseases**, risk factors for more severe periodontitis, and type 2 diabetes. Much of his focus during this period was on **pathogenesis of periodontitis**, "**periodontal medicine**," key **markers of inflammation** in periodontitis, and local delivery of pharmaceuticals to control prostanooids. Steve expanded his network of collaborators to include Phoebus Madianos, Jim Beck, Roy Page, Ken Kornman, Raul Garcia, Ray Williams, David Paquette, and Giovanni Salvi.

From 2000 to 2010, he emphasized inflammation as a common factor linking multiple diseases. Steve was heavily focused, but often challenged, at demonstrating that treatment of periodontitis could alter adverse pregnancy outcomes. He also sought the **mechanisms linking periodontitis and adverse pregnancy outcomes**. He was enthusiastic about **epigenetics** and what he termed the **biofilm-gingival interface**. The evidence continued to indicate that periodontitis was influencing risk for strokes and renal insufficiency. Steve partnered with Ray White to explore **third molars and their influence** on the oral cavity and systemic inflammation. Additional collaborators during this period included Kim Boggess, Silvana Barros, Bob Singer, Kevin Moss, Bob Genco, Will Giannobile, and Ira Lamster.

From 2010 to 2020, Steve became heavily engaged with **genome-wide association studies** and cluster approaches that allowed his research group to establish **periodontal profile classes**. He also broadened his perspective of periodontal medicine and precision oral health, and explored **periodontitis relative to cancer risk and adiposity**. The broadening of collaborators included Panos Papapanou, Kimon Divaris, Thomas Kocher, Birte Holtfreter, Paul Ridker, Thiago Morelli, Julie Marchesan, Bruno Loos, John Preisser, and Elizabeth Platz.

Much of what we consider today as core components of periodontal disease and the disease's potential impact on systemic diseases was certainly influenced by Steven Offenbacher.

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The papers in this supplement highlight the evolution of several key areas to which Steve was very dedicated and include perspectives by innovative collaborators. All papers are based on presentations given by the authors/collaborators below at the Symposium in October 2019.

Periodontal Disease: Inflammation & Pathogenesis

- Julie Marchesan – Inflammasomes as Contributors to Periodontal Disease
- Kenneth Kornman – Future of Preventing and Managing Common Chronic Inflammatory Diseases
- Thomas Van Dyke – Shifting the Paradigm from Inhibitors of Inflammation to Resolvers of Inflammation in Periodontitis

Periodontal Medicine/Oral-Systemic Connection

- Max Goodson – Disease Reciprocity Between Gingivitis and Obesity
- Souvik Sen – Exploring the Periodontal Disease–Ischemic Stroke Link
- Kim Boggess – Choosing the Left Fork: Steven Offenbacher and Understanding Maternal Periodontal Disease and Adverse Pregnancy Outcomes
- Mark Ryder – *Porphyromonas Gingivalis* and Alzheimer’s Disease: Recent Findings and Potential New Therapies

Precision Oral Health

- Kimon Divaris – Biologically Informed Stratification of Periodontal Disease Holds the Key to Achieving Precision Oral Health

- Panos Papapanou – Subgingival Microbiome and Clinical Periodontal Status in an Elderly Cohort: The WHICAP Ancillary Study of Oral Health
- Silvana Barros – Maintaining Barrier Function of Infected Gingival Epithelial Cells by Inhibition of DNA Methylation

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