

# today <sup>23</sup> <sup>24</sup> <sup>25</sup>

**Nobel Biocare Edition**



**Global Symposium • New York • June 23–26, 2016**



## **Nobel Biocare Global Symposium June 23–26, 2016**

### **Time**

June 24	7.30 a.m.–6.30 p.m.
June 25	7.30 a.m.–6.30 p.m.
June 26	7.30 a.m.–4.40 p.m.

### **Place**

Waldorf Astoria  
301 Park Avenue  
New York, N.Y. 10022, USA

### **Organizer**

Nobel Biocare Services AG  
P.O. Box CH-8058  
Zürich-Flughafen, Switzerland

### **More information**

[www.nobelbiocare.com/global-symposium-2016](http://www.nobelbiocare.com/global-symposium-2016)

## **Innovation comes to life at the 2016 Nobel Biocare Global Symposium**

Nobel Biocare welcomes dental professionals from around the world to the Big Apple

■ Yesterday, the 2016 Nobel Biocare Global Symposium opened its doors to dental professionals from all over the world in the heart of New York. Held for the third time, the event promises to be the implant dentistry event of the year.

A continuous increase in demand for dental implant treatments as a result of growing consumer awareness, the ageing population, growing accessibility, as well as greater product availability and other influencing factors, has accelerated the demand and need for education in this field over the past decade.

Nobel Biocare has established its reputation as a provider of top-level education through the development and refinement of dental therapy concepts. With its global symposium in particular, the company stages a truly exceptional event by inviting dental professionals to join its high-class educational program at the legendary Waldorf Astoria in the world metropolis New York.

With more than 150 world-class speakers, and a total of over 50 master classes, and about 40 hands-on courses for dentist and dental technicians, the event promises to be an incomparable experience for everyone attending.

At the symposium opening on Thursday morning, Nobel Biocare president Hans Geiselhöringer said: “We are today continuing the journey to innovation we started in 2010 with the first global symposium. Over the past three years, we have invested in developing innovations that help dentists treat their patients better and will continue to do so. In this approach, the well-being of the patient is always our priority. We challenge ourselves every day to think about how we



can be more successful in treating patients—this is the DNA of Nobel Biocare.”

Since the announcement of the symposium dates, dental professionals have eagerly registered. The event was sold out well before the registration closing. Overall, Nobel Biocare will be welcoming more than 2,000 participants over the course of the four symposium days, with about one-third of the people attending from North America, one-third from Europe, and a considerable number of attendees from the Asia-Pacific region as well as the Middle East and Africa.

The program of the symposium is divided into three main themes: Treatment enhancement and refinement—evidence counts; Reaching excellence in esthetics by joining the journey of digital dentistry; and Achieving clinical excellence in challenging situations. Each theme has a complete line-up of its own, from lectures and master classes to hands-on sessions.

For the first time in the history of the symposium, registrants had the opportunity to influence the symposium program by voting for various topics, formats and speakers in advance. Through a crowdsourcing model, visitors to the event website selected the topics they would like to see featured. Those that received the most votes were incorporated into the program. The chosen sessions were two case studies—one on soft-tissue management and the other on immediate loading protocols—and a keynote lecture on the true benefits of digital dentistry.

On behalf of the members of the organizing committee, scientific chairperson Dr. Peter Wöhrle welcomed attendees during the kick-off session on Thursday morning. “Many of



Hans Geiselhöringer

**From the President  
WORKFLOW ENHANCEMENT**

At Nobel Biocare, our innovation efforts are based on clinical requirements, patient needs and scientific research. These have led us to superior products and solutions, as well as efficient treatment workflows that reduce treatment time—in other words, shorter time to teeth.

With our leading integrated workflow, treatment steps that were previously considered mandatory have been made faster, combined or even removed entirely. Our new technologies continue to enhance diagnostics and treatment planning. Digital integration improves collaboration among treatment partners and helps bring the laboratory into the treatment process as early as the planning phase, meaning prosthetic considerations are taken into account right from the start.

We are also advancing componentry in order to improve clinical workflows. The most important new addition to our portfolio in this regard is the On1 concept. This new approach to the restorative process ingeniously bridges the gap between the surgical and prosthetic workflows with a modular solution. The On1 Base connects to the implant at time of surgery and is then left in place throughout the healing process, the prosthetic work and the lifetime of the restoration. This leaves the tissue undisturbed for optimized healing, but unlike with tissue-level implants, there is no compromise on restorative flexibility.

In addition, the workflow for the components has been refined with a view to dramatically reducing treatment time. As the On1 healing cap supports an intra-oral scanning approach, conventional impression-taking procedures for delivery of the final crown can be eliminated. This can save time and improve patient comfort. What's more, the On1 Base offers the clinician placing the implant added peace of mind, knowing that only precision-engineered Nobel Biocare components can be used in conjunction with the implant, thus removing the risks associated with an ill-fitting third-party abutment.

Such advancements mean dental professionals can treat more patients each day, with better results. Consequently, more patients experience the improved quality of life dental implant treatment brings, and both clinicians and technicians can grow their businesses. It is such outcomes that we at Nobel Biocare strive for every single day; it is designing for life in action.

the people joining this third global event of Nobel Biocare have travelled long distances from all over the world, which reminds us how important this conference is," Wöhrle said.

In addition, Nobel Biocare prepared an exciting array of forums, including an innovation assembly on Saturday, at which the company will be exclusively previewing its upcoming innovations, and a full-day forum on Sunday that will be focusing on compromised patient treatment.

Under the slogan "Where innovation comes to life", Nobel Biocare is unveiling a number of innovative new products and solutions at the event, including the On1 restorative workflow concept that bridges the gap between the surgical and prosthetic workflows, a new NobelProcera Crown in a new high-translucency multi-layered full-contour zirconia material, and the new NobelZygoma implant that provides greater surgical and prosthetic flexibility when treating severe maxillary resorption without grafting.

"The innovations we are presenting at the Nobel Biocare Global Symposium 2016 have all been created to address the specific needs of today's dental professionals as they strive to improve care for patients. Informed by studies confirming the possibilities and advantages offered by immediate placement and provisionalization, many of these new products and solutions are so unique that they are either patent-protected or in the patent process," Geiselhöringer said. ◀◀

**More to explore!**

More information about the program is available at [www.nobelbiocare.com/global-symposium-2016](http://www.nobelbiocare.com/global-symposium-2016).



**Where innovation comes to life**  
Nobel Biocare Global Symposium  
June 23–26, 2016



**Don't miss!**

**June 24, 8 a.m. to 12 p.m.**  
Forum: **NEXT GEN**  
Starlight roof

**June 25, 1 to 5 p.m.**  
Forum: **Innovation assembly**  
Grand Ballroom

**June 26, 8 a.m. to 5 p.m.**  
Forum: **The compromised patient**  
Grand Ballroom

# Global Symposium attendees speak out

Dental professionals from near and far are here to stay on the cutting edge



by Dental Tribune International

■ Dental practitioners from around the globe have gathered in New York City for the 2016 Nobel Biocare Global Symposium. They came here to take advantage of the wealth of information and expertise being shared, to be among the first to see the latest technological advancements, and to connect with their compatriots. DTI spoke with a few attendees to find out what they are hoping to learn here and take back home to their practices.

**Javier Alánde**  
Spain

“I think everything being presented here at the symposium is very interesting. I have been using implants in my practice for 27 years. I always work with Nobel Biocare. With these products I can offer my patients security and confidence.”



• Javier Alánde, Spain



• Patrik Andrén, Sweden

**Patrik Andrén**  
Sweden

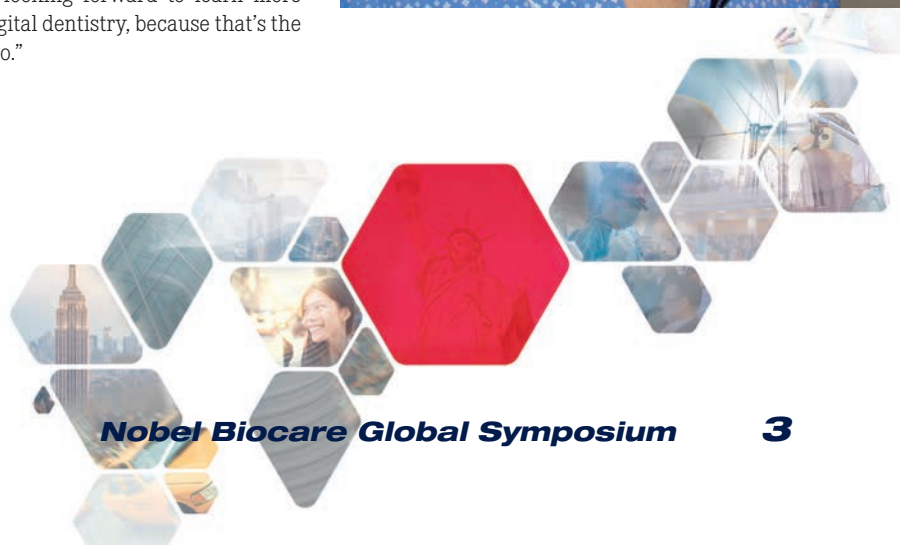
“I only started placing implants two years ago and have already attended a number of local Nobel Biocare symposia in Sweden. However, this is my first global event and I’m very excited. I’m especially looking forward to learn more about digital dentistry, because that’s the way to go.”

**Bassim Essadi**  
Jordan

“This is the biggest event in dental implants, and I am here every three years. All of the speakers here are very good. This technology means less discomfort, more predictability and stable results for my patients. In addition to the very valuable lectures, I also enjoy being in New York.”



Bassim Essadi, Jordan





**Matthias Leupold Hlawitschka**  
Switzerland

"I am here to partake a little bit in the education, and a little bit for the new products. I also enjoy the social events, meeting my friends and colleagues. I also enjoy visiting New York. I use three different implant systems in my practice, and I use Nobel Biocare in about 80 percent of my cases. This technology allows me to offer my patients good function and good esthetics."



**Gaurav Malik**  
India

"This is one of the best global events, offering so much innovation. I am here to learn new things and to incorporate new treatment modalities in my practice, especially the All-on-4 treatment concept. We just started incorporating that, and I want to be a little more sure on all the protocols. Prof. Paulo Malo is considered a pioneer in this area, and I have been following him for quite some time. I will be attending his master class and his hands-on."



**Joe Merheb**  
Belgium

"I am a surgeon, and I was invited to attend by Nobel Biocare. I am here to learn more about implant surgery. A nice smile and the ability to chew is a very important part of a person's happiness and comfort. Being able to give this to my patients in a nice and elegant way, which differs a lot from traditional prosthesis, is a very important improvement. It helps patients physically, psychologically and socially. There are a lot of interesting presentations being offered here."



**Javier Muñiz**  
Mexico

"I am involved with a many dental clinics in Mexico, where we place a lot of implants. I am here for the educational opportunity. I am signed up for six master classes, and I am particularly looking forward to the presentations by Prof. Paulo Malo and the presentations about the All-on-4 treatment concept. I am here with some of my colleagues. We are always striving to do things better and better."

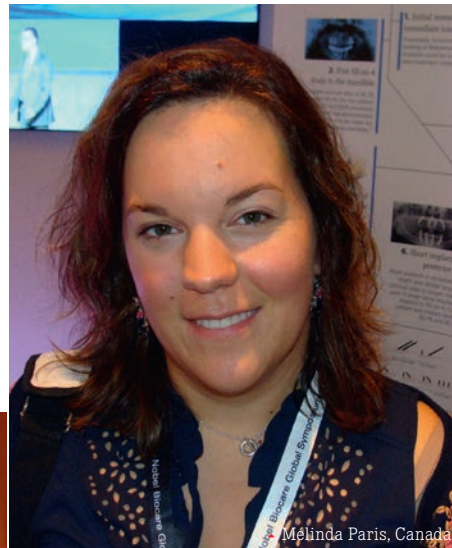


**Chinji Nakajima**  
Japan

"I am here at the Nobel Biocare Global Symposium to study. I have been using implants in my practice in Tokyo for 20 years now. I am particularly interested in the bone regeneration class being presented here by Dr. Istvan Urban of Hungary."

**Mélinda Paris**  
Canada

"I am from Quebec City, and I am here to get more expertise in the All-on-4 treatment concept. I am particularly looking forward to the hands-on educational opportunity here. I use Nobel Biocare implants in my practice. I like the stability. The technology is



user-friendly, and the company's customer service is very good."

**Anthony Sallustio**  
USA

"I have been using Nobel Biocare implants almost exclusively in my practice in Ocean Township, New Jersey, for 20 years. I am here looking for new technologies and



ways to improve delivery of care to my patients, improving their lives. With this technology I can offer predictability, improvement of function and form, and better esthetics."

**Garry Shnyder**  
USA

"I have been using Nobel Biocare implants in my practice in New York City for six

years. I am here at the conference to see what's new and current, and to see what I can improve on. I always strive to be on the



leading edge of technology for the benefit of my patients."

**Andy Temmerman**  
Belgium

"It's always nice to see some valuable lectures and to see New York, of course. I am a regular user of Nobel Biocare implants. I have heard that they will be introducing new abutments, and that is something I am looking forward to. There is a lot of science right now advocating for the immediate placement of abutments, and I think this will ultimately lead to a final outcome in a better way." <<



**today Nobel Biocare Global Symposium Imprint—About the Publisher**

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# “This is the most comprehensive congress I have ever taken part in”

An interview with scientific committee chairmen Drs. Bertil Friberg and Peter Wöhrle

by Dental Tribune International

■ **Drs. Friberg and Wöhrle, could you please introduce yourselves to the readers by telling them how you became involved in the scientific committee of the 2016 Nobel Biocare Global Symposium?**

**Dr. Bertil Friberg:** I have been a member of the Brånemark Clinic in Gothenburg, Sweden, since its founding in 1986. For the past 30 years, I have been working in close collaboration with Nobel Biocare regarding lectures, research and clinical activities.

**Dr. Peter Wöhrle:** During my doctoral and postdoctoral training at Harvard in the 1980s, I was introduced to the work of Prof. Per-Ingvar Brånemark. Ever since then, implant dentistry has been the focus of my professional career. Over the years, I have become increasingly involved in research and teaching in addition to clinical work. My formal training in the interrelated areas of implant dentistry, namely surgery, prosthetics and laboratory technology, allows me to help improve outcomes based on understanding the effects and synergies on each other and streamlining of the different aspects of treatment.

**What did you consider most important in compiling the scientific program for the symposium?**

**Friberg:** This is the most comprehensive congress I have ever taken part in. It covers all topics of importance in daily implant practice, the laboratory, preclinical evaluations and treatment planning, implant placement and prosthetics, maintenance considerations, complications and how to handle them, and how to interpret result data.

**Wöhrle:** This symposium has something to offer for every attendee, as it covers all aspects of topics related to implant dentistry. We went to great lengths to develop several different tracks based on specific topics of interest. Once the attendee decides which topic is most interesting, the schedule allows and encourages full exploration of that subject via lectures, master classes and hands-on courses. We will have multiple activities every minute of the symposium, offering unprecedented learning opportunities based on individualized interests and scheduling.

**The theme of this year's event is “Where innovation comes to life.” Which innovations can participants look forward to in particular?**

**Friberg:** In addition to various new components, including NobelParallel, NobelActive WP and angulated screw channel abutments, which aim to facilitate the work of clinicians, participants will learn about the latest in digitization, handling research data, cell biology and osseointegration, as well as the latest in the treatment and prevention of periimplantitis.

**Wöhrle:** There will be ample innovations presented during the symposium, culminating in the innovation assembly forum on Saturday afternoon. The entire session will be devoted to new and upcoming products and trends in implant dentistry. This is an event not to be missed.

**What are the implications of these new developments for daily clinical practice, and how can both dentists and patients benefit?**

**Friberg:** These developments will help facilitate treatment in the posterior region,



• Dr. Bertil Friberg



• Dr. Peter Wöhrle

avoid cementation in the anterior region and prevent complications. They also offer various implant designs for specific clinical situations and represent further developments in hard- and soft-tissue management.

**Wöhrle:** The overriding goal of significant innovations in implant dentistry is to allow practitioners to achieve better long-term clinical outcomes in more patients. The graftless approach and the digital workflow, including 3-D planning and implant placement with CAD/CAM-generated surgical templates, are prime examples of how innovations can transform long-established protocols for the benefit of the patient.

**Both of you have many years of experience in implant surgery. How has the field progressed in the last 20 years, and how can events like the Nobel Biocare Global Symposium support dentists in keeping up with these changes?**

**Friberg:** This meeting addresses the main innovations we have seen over the past several years, such as improved techniques in both surgery and prosthetics. With the technology and methodology today we are, for example, able to treat severely compromised cases in terms of poor bone volume and poor bone texture much better. At the symposium, participants will have the opportunity to interact during treatment planning sessions, and ahead of the event, they have been able to suggest topics of individual interest that will be presented by various speakers.

**Wöhrle:** Major milestones in the last 20 years have been the introduction of the TiUnite surface, significantly decreasing early failures in certain applications and groups of patients, and immediate loading in

select cases, shortening treatment time and thus cost for patients. Currently, the digital revolution—CT-based planning programs, CAD/CAM-generated surgical templates, and digitally designed and manufactured restorations—has changed the way we practice dentistry today, and it will change it even more in the future.

**Digitization is becoming increasingly important in all kinds of industries and dentistry is no exception. Will the symposium also address this topic, as outcomes of implant placement may become significantly more predictable with digital technologies?**

**Friberg:** In my opinion, computer planning of implants is much more important when treating patients with severely resorbed jaw bone and in patients in whom implants may interfere with various anatomical landmarks, and for whom exact positioning of the implants may be the difference between success and failure. Straightforward cases are normally solved without digitization.

**Wöhrle:** Digitalisation will absolutely be addressed. Digital implant planning and placement deliver more efficient care with consistently better outcomes, especially in the partially edentulous patient. Placing an implant that is restorable is no longer the aspiration; with today's technology, one can do better. Properly executed guided surgery, combined with proper treatment

planning, elevates the level of excellence while increasing efficiency and safety.

**Another major topic in implant dentistry is the treatment and prevention of periimplantitis. What is the current scientific evidence on this issue?**

**Friberg:** This is a topic addressed in many congresses today. We must keep in mind that there is still not an accepted definition of periimplantitis and, thus, prevalence figures vary a great deal. Several efforts have been made to gather expertise from all over the world to provide consensus statements on the problem.

At the moment, we do not sufficiently understand the periimplantitis issue, its site specificity, its sometimes very poor response to treatment, the impact of microbes, the foreign body reaction and so on. However, all these topics will be addressed at the symposium to provide clinicians with the latest research on periimplantitis.

**Wöhrle:** As Dr. Friberg just explained, there is no consensus on the definition of periimplantitis, its cause or even its treatment. I am looking forward to the latest research and updates that will be presented during the symposium. ◀◀



# Manufacturer matters when it comes to ceramic abutments

An interview with Prof. J. Robert Kelly

by Nobel Biocare

■ A new study conducted by leading materials scientist Prof. J. Robert Kelly has confirmed that not all dental implant restorations are created equal. In this interview, Kelly discusses the research, which has very recently been published in the *International Journal of Oral and Maxillofacial Implants*.<sup>1</sup> The findings make for positive reading for NobelProcera customers.

**Nobel Biocare News: Your latest research tested the fatigue behavior of zirconia implant abutments from four major manufacturers. What led you to take this approach?**

**Prof. J. Robert Kelly:** We wanted to study commercial products not in order to make commercial comparisons, but to study realistic products. Our goal was to look for processing problems and design issues, so it made sense to see what would happen with products on the market. We selected Straumann Bone Level (BL) Implants as our reference and the study received funding from the ITI Foundation. Our search for comparison third-party abutments for the BL implants led us to abutments from NobelProcera and Glidewell—for BL implants these two manufacturers only produce hybrid zirconia abutments that have a titanium insert interface to the implant—and the available abutments from Astra and Straumann that are fully zirconia.



Prof. J. Robert Kelly

**What was your methodology for testing these products?**

For the first phase, we first took six of the abutments in each of the four groups and

tested them with repeated loads of 200 N. We chose 200 N for the accelerated aging based on our previous work. We did not want to break the implants, so we thought

that was a fair load to start with. The results then allowed us to design the second phase, by determining the loads that we would use in testing with another 12 implants.

However, by the time we received the data from the first phase, we were astounded. There were clearly significant differences between manufacturers in each of the categories. This was subsequently verified in full-sample testing.

**You found that the NobelProcera product outperformed the other abutments in this test significantly.**

Yes, absolutely. While we had to reduce the load with some of the other abut-

ments, with the NobelProcera product, we ran out (no fractures at 25 million cycles), so the load had to keep going higher and higher.

**How would you explain this apparent weakness of the other abutments?**

The vast differences were unexpected, as the macro-designs are similar across the manufacturers. To help determine why we were seeing such varied results, I asked my colleague Dr. Isabelle Denry to do scanning electron microscopy analyses. Looking at one of the poorest performing abutments in the study, she identified that the weakness was the result of damage arising from the manufacturing process—subsurface grinding damage, large cracks, inhomogeneous crystals and a diffuse layer of porosity. From this, it was evident that manufacturer matters.

**There are many reports of issues caused by third-party abutments being used with a system that they were not designed for. Considering that manufacturer matters, do you advocate using only authentic components?**

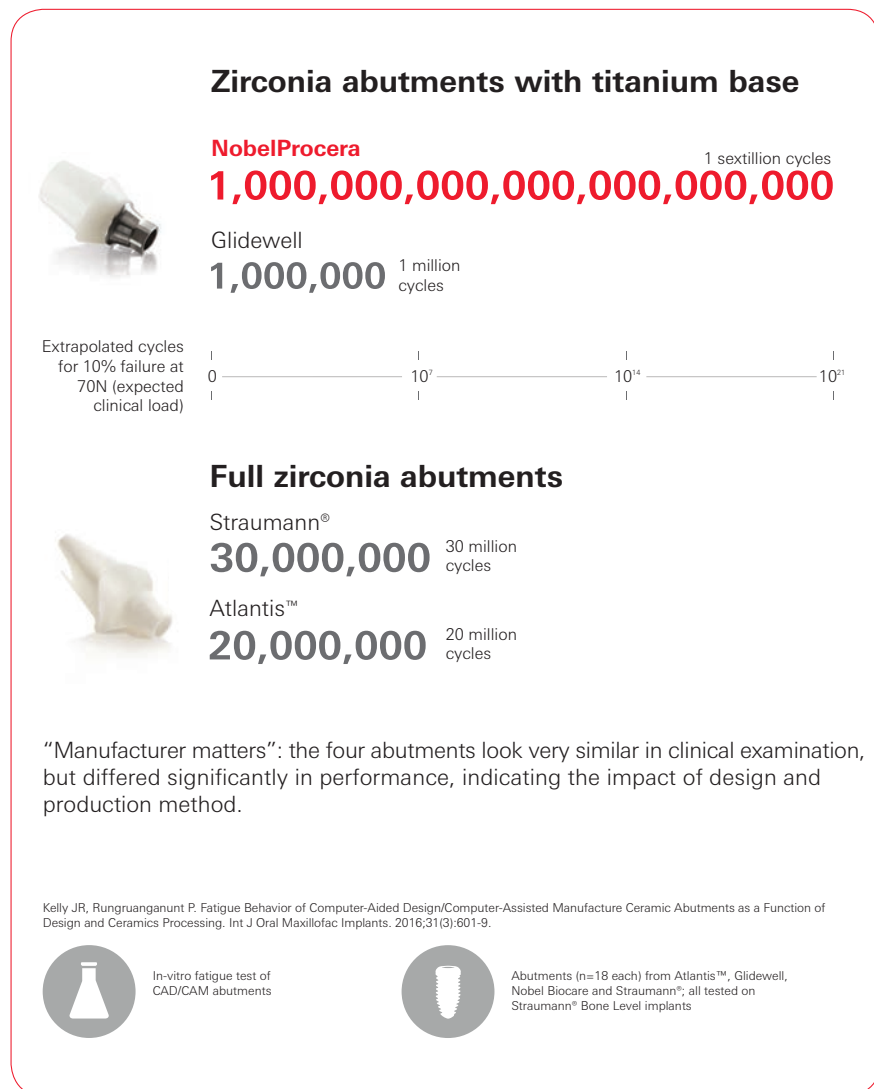
In general, I advise against using lower cost third-party abutments. There is too much to lose. From what we have seen over the years, the quality of the materials is inferior, and the outcome has such a high value: the patient has very high expectations of the clinician—why would you risk that to save \$100?

**Considering that the NobelProcera abutment for BL implants outperformed all of the others, what are your thoughts?**

NobelProcera is produced in a high-quality process, since Nobel Biocare fabricates components that are designed, tested and then verified for the BL implant system. ◀

*Reference:*

1. Kelly, J.R. & Rungruanant, P., "Fatigue behavior of computer-aided design/computer-assisted manufacture ceramic abutments as a function of design and ceramics processing", *International Journal of Oral and Maxillofacial Implants*, 31/3 (2016), 601-9.



Zirconia abutment D1.

# Taking life at more than face value

The face can express who we are as well as what we mean to say

by Prof. Jill A. Helms, U.S.

■ We come into this world primed to connect with the faces around us. This ability is literally hardwired into our neural circuitry. There is a specialized region in our brain, located in the temporal lobe in a region called the fusiform gyrus, that is filled with neurons that preferentially fire whenever a face comes into view. Within minutes of birth, babies begin using this brain region; studies demonstrate that even very young infants show a strong preference for looking at faces over all other objects.

The brain is responsible for coordinating every single activity that keeps you alive; and some terribly precious real estate in the brain is allocated to a pint-sized structure whose only apparent purpose is to become activated in response to a face. Since evolution is constantly shaping the brain and adapting its function to ensure our survival, the fact that a brain region is dedicated to this task indicates that facial recognition must be essential for our survival.

## But why?

One reason is that the face is the means by which we communicate. Thirteen years after *On the Origin of Species* was published, Charles Darwin addressed this very question in *The Expression of the Emotions in Man and Animals*. In this book, Darwin wrote, “The welfare of mankind depends on the expression and recognition of emotion.”

And if you do not believe Darwin, then witness any adult with an infant. Of all the motor skills that infants must master, none is as important as mimicking the facial gestures of people around them. Even at a very early age, humans devote a great deal of



• The face is the means by which we communicate. Of all the motor skills that infants must master in the first few years of life, none is as important as mimicking the facial gestures of people around them.

and you will get a stick figure with a lollipop-sized head, complete with a face. The face defines the entity.

Illustrators of children’s books exploit this very characteristic: Everything of emotional importance to a child is illustrated with a face. The sun has a face. The moon has a face. Thomas the Tank Engine has a face. It is a way to personalize the world.

that are the most average-looking. Experiments using composite images based on hundreds of women’s faces have demonstrated that when people are confronted with the image of Ms. Average-Face World—regardless of the viewers’ ethnic background—they uniformly agree that she is more beautiful than the individual faces that make up the composite. In short, as a species, we find the average face to be the most beautiful.

## Reverse side of the coin

Diseases and injuries can create asymmetries and imbalances in the proportions of the face that can be fatal for social interaction.

Because the face is often the calling card of a disease, people often intuitively shy away from disfigured people. Looking different on the outside, of course, does not mean that you are different on the inside. Nevertheless, there is no denying that a physical transformation of our face powerfully affects the way we view ourselves and the way others respond to us.

Although beauty is best defined by the kindness, compassion, intelligence and warmth of an individual, it is also expressed as optimism and perseverance in the face of adversity.

For those who have suffered a mishap or a disease that leaves them looking different, reconstructive surgery and/or prostheses supported by osseointegrated implants can be decisive for living a good life outside the confines of the home. ◀◀



## About the Author

A member of the scientific committee for the 2016 Nobel Biocare Global Symposium and a professor in the Department of Surgery

at Stanford University, Dr. Jill A. Helms carries out research in the field of regenerative medicine, collaborating with experts in bio-engineering, materials science, physics and the life sciences. In this article, she explains why reconstructive craniofacial surgery can be decisive for the well-being of a deformed or injured patient. *aut aeratem nis est iunt otatur?*

## More to explore!

To view Prof. Jill A. Helms’s TEDx Talk, titled “Reconsidering beauty,” please visit [bit.ly/TED-helms](http://bit.ly/TED-helms).



• Across all ethnic groups and epochs, the general hallmarks of beauty have been symmetry and a balance in proportions.

attention and energy to teaching infants the movements required for facial expression. In fact, we know that children who are incapable of or uninterested in learning this task are often later diagnosed with conditions such as autism.

This focus on the face ultimately translates into our faces becoming central to our sense of identity. One does not need to look much further than children’s drawings to see this. Ask a 5-year-old to draw a human being

## Beauty, a sign of well-being

The face is not only important as a means to communicate; it also serves to advertise our health, youth and vitality. A face that projects an image of great health indicates a good choice for a mate.

Across all ethnic groups and epochs, the general hallmarks of beauty have been symmetry and a balance in proportions. Surprisingly perhaps, people universally agree that the most beautiful faces are actually those



# Why NobelProcera CAD/CAM bars?

For the sake of quality, function, esthetics and good business

by Michael Stuart, Nobel Biocare

■ Certified dental technician Thomas Wade is the owner of New Horizons Dental Laboratory on the outskirts of Denver, Colorado, U.S. According to him, the quality and efficiency gains that result from outsourcing the production of bars to NobelProcera is rewarding for everyone involved.

bars themselves and of the finished cases both in his brochure and on his website.

"In the early days, I actually took the first few bars I did around to key clients to show them the accuracy and beauty of these bars first hand," he explained. "Today, I not only show the bars, but also use screenshots taken from the design, including the all-important 2-D cross-section to help highlight

to better, more effectively treat a patient's specific intra-oral needs."

## NobelClinician facilitates teamwork

Especially in cases involving edentulous or nearly edentulous arches, clinicians who use NobelClinician treatment planning software become natural collaborators for a laboratory like New Horizons.

tween the surgeon and the restorative team, and encourages collaboration and communication between the two.

"Success used to be measured simply by the percentage of surviving, well-osseointegrated implants. Today, success needs to be redefined to take good restorative planning and strategic implant placement into account. To serve the patient well, we want to be able to fabricate a prosthesis that will work well, look good and prove durable. Planning with NobelClinician is the best option available to achieve this."

According to Wade, both the process and end result are always superior—with improved predictability, repeatability, enjoyment and profitability—when working with dentists who use NobelClinician. "It also prevents stress and heartache, and saves us all time!" he emphasized.

Having NobelClinician software running at his laboratory has become a major boon to his business, by vastly increasing his stature as a valued team member, according to Wade.

"I do not plan cases for the clinicians, but I do review a wide variety of restorative criteria, and verify that the plan will facilitate the fabrication of a highly successful prosthesis."

Even when the team is geographically separated, "the ability to share a plan between the three corners of the 'golden triangle' (i.e. the surgeon, the restorative dentist and the laboratory) offers unprecedented opportunities for success."

Using NobelClinician on the front end and NobelProcera bar technology for the final restoration on the back end makes for a powerful combination.

Wade concluded: "In short, it is a beautiful thing!" ◀◀



• Thomas Wade makes a convincing argument that "a bar is best designed by a skilled technician with experience in intra-oral biomechanics."

Wade has chosen NobelProcera technology as his exclusive provider of CAD/CAM-milled titanium bars for two main reasons: "First of all," explained Wade, "the NobelProcera software allows us to access and provide a wide variety of solutions entailing many different types and styles of bars, customization features, and attachments—all in order to better address the patient's individual needs."

Secondly, it is Wade's view that this technology puts design control in the proper hands. "A bar is best designed by a skilled technician with experience in intra-oral biomechanics," he stated simply. He went on to explain that, since the bar is only one of several components in a successful restoration, the bar designer must fully understand how the bar will support the other components, such as denture teeth and the PMMA base, in order to provide long-lasting function and esthetics.

Wade cited other reasons for using NobelProcera CAD/CAM bars. Broad and comprehensive technical support is high on his list, as is the state-of-the-art design software that keeps him competitive as he works at the technological cutting edge.

"Meticulous quality control by NobelProcera, especially as it relates to passivity of fit and finish," Wade added, "all but eliminates remakes," saving time, effort and money.

## Clear advantages

In order to convince clients to adopt this technology, Wade uses photographs of the

purposeful and deliberate choices I have made in the design process."

Wade believes that the combination of design screenshots and final product photographs create a powerful statement about the quality of the engineering and biomechanics.

"Demonstrated quality serves as a strong marketing tool," he said. "Also, at a time when most bar cases have been oversimplified to a one-size-fits-all treatment plan of full wrap design, I have made my clients aware that we can offer a multitude of design styles

"Digital planning—which identifies any obstacles, defines the parameters for any necessary bone augmentation or reduction, and indicates strategic placement of the implants—is the key to overall prosthetic success," Wade asserted. "What the implant surgeon does, or does not do, on the day of surgery sets the tone for the overall success of the case moving forward, but make no mistake, even though implant placement is a surgical procedure, it is prosthetically driven."

According to Wade, NobelClinician software makes it possible to bridge the gap be-

## NOTE:

Thomas Wade will be lecturing two sessions twice today. His lecture, titled "The All-on-4® treatment concept for an immediate temporary bridge," will take place at 8 a.m. and again at 11 a.m. In addition, he will be presenting a lecture on the topic "Fixed versus fixed-removable prostheses" at 1 p.m. and 4 p.m.



• NobelProcera free form milled and Dolder bar.



# The very definition of synergy

The whole is greater than the sum of its parts

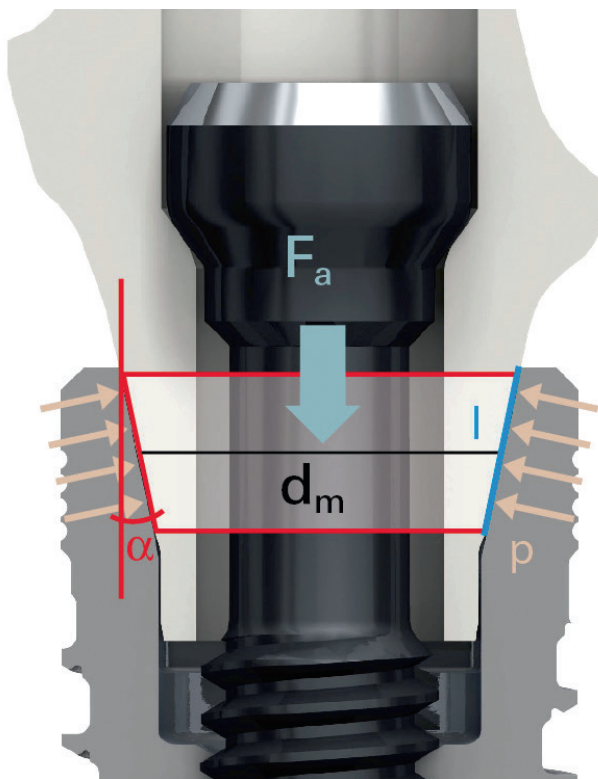
by Dr. Stefan Holst, Germany

■ Nobel Biocare does not develop individual products but entire solutions that provide fully functional, natural-looking, long-lasting results. In order to ensure long-term clinical performance, safety and cost-efficiency for everyone involved in the treatment process, each Nobel Biocare component has been designed to fit and function perfectly with its related components. Together, they produce a finely tuned system.

## Parameters that influence long-term performance

Computerized simulation tools, such as finite element analysis, and biomechanical testing in the laboratory have served to identify parameters that can impact the performance of an implant system. These parameters include joint compression (the force that acts at the implant-abutment interface under loading conditions), preload (the tensile force keeping the components together) and the friction coefficient (which depends on the surface materials that are in contact with each other).

Other significant parameters include the force that the patient exerts on the system by chewing (masticatory force), as well as the length of the contact between the abutment and the implant, as well as—when using a conical connection implant—the angle of the abutment. A small change in any of these parameters—even one not visible to the eye—can lead to extreme load and stress conditions that result in system failure.



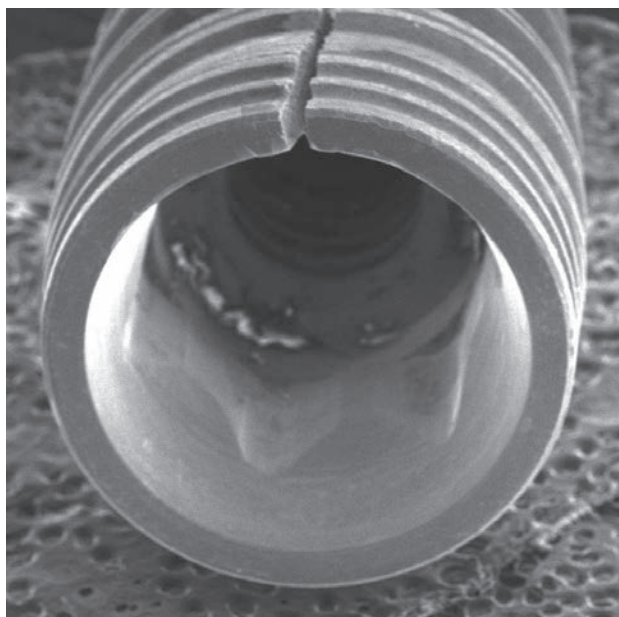
• Precise fit ensures long-term performance. For conical connection implants, joint compression ( $p$ ) depends on a number of variables, such as preload (tensile force,  $F_a$ ), friction angle ( $\alpha$ ) and contact length ( $l$ ). Small changes in any of these parameters can lead to extreme load and stress conditions, which can cause implants to fracture.

## Precise fit for joint stability

The interface between the implant and abutment is critical for joint stability. Manual adjustment of a cast or the use of a substitute abutment can alter the contact angle and contact length. Such an undefined contact situation

When assessing any implant-supported restorative solution for a patient, one has to keep in mind that the entire system under consideration is only as strong as its weakest link. The performance of each specific component depends not only on the quality and design of the component itself but also on its interface with the rest of the restorative system. Consequently, each component should not be evaluated on its own. Clinically relevant conclusions can only be reached when a component is tested within the system it is a part of. Nobel Biocare therefore conducts testing and research on both individual components, such as implants, abutments and screws—and how they work together—as well as the entire system that they constitute.

We at Nobel Biocare study systems from their initial design to long after delivery to the end-user, the patient. We develop and scrutinize engineering and manufacturing processes, and we carry out quality assurance, clinical research and post-market surveillance. Only with this approach can we be certain that the system will function safely and reliably for many years to come.



• Mismatching components can have severe consequences. Imprecise fit leads to uncontrolled peak forces, which may result in implant fracture.

entails a degree of risk for the patient that is difficult to predict, much less manage.

Furthermore, *in vitro* force application to an implant-supported prosthesis may additionally exacerbate such misfit. Consequently, using an abutment designed and engineered by Nobel Biocare to match the implant is crucial for system performance. It not only affects the fit of the restoration



• Dr. Stefan Holst, Vice President of Implant Systems and Research at Nobel Biocare: “Clinically relevant conclusions can only be reached when a component is tested within the system of which it is a part.”

on the implant itself, but may also have an impact on performance-relevant parameters.

## Preload, the force that holds the components together

Preload is defined as the tensile force created in the clinical screw as the result of screw tightening. It is generated by the application of torque to the screw, although only a fraction of the torque force is stored as preload, while a much larger percentage is spent on overcoming friction.

To account for this major loss of torque, and to ensure that the system is sufficiently held together, the screw has to be inserted at the recommended torque. Fully manual screw insertion is likely to result in lower torque and, consequently, suboptimal preload.

Insufficient preload leads to increased relative motion between the system components, and this can contribute to screw loosening and/or component failure. Conversely, preload values that are too high can result in component fracture.

## Optimized to the last detail

Nobel Biocare abutments are delivered with a dedicated clinical screw that has been optimized for the implant-abutment system it is a part of. Depending on the abutment, connection type and platform size, screws come with or without a surface coating.

The absence or presence of the coating and the coating type all affect the preload. For example, with

a diamond-like carbon coating, screws marketed under the TorqTite brand show higher preload values compared with screws that have a standard titanium surface. Nobel Biocare provides an appropriate screw type for every implant-abutment connection, ensuring a tight and stable fit for long-term performance.

## Avoid substitutes, minimize patient risk

If substitute components are used, the parameters governing system performance are no longer controlled. Consider maximum joint compression—which defines the load that the implant collar can bear—as an example: A substitute may result in a force that is higher than the allowed maximum, causing the implant to fracture.

To prevent such catastrophic results, the peak forces have to be distributed in a controlled way. This can only be achieved by using high-quality, precision-manufactured components that have been designed and tested both individually and as part of the system for which they have been designed. ◀◀

### NOTE:

Dr. Stefan Holst will be giving a presentation today as part of the main program session, titled “Prosthetic concepts—Reaching optimal esthetic outcomes with CAD/CAM solutions,” which will run from 1 to 5 p.m.

