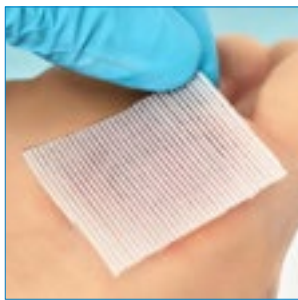


# Scientific Tracks & Sessions

## April 15, 2022 | Day 01

### *Wound Care 2022*



5<sup>th</sup> International Conference on  
Wound Care, Tissue Repair and Regenerative Medicine

April 15-16, 2022 | Paris, France

## Wound Healing | Wound Dressings | Wound Ulcers



**Chair**  
**Vladimir Emelyanenko**  
First Clinical Medical Center Ltd  
Russia

### Session Introduction

Title: Use of internally validated *in vitro* biofilm models to assess antibiofilm performance of silver-containing gelling fibre dressings

**Hannah Thomas** | Perfectus Biomed Group | UK

Title: Healing rate of chronic and subacute lower extremity ulcers treated with contact ultrasound and noncontact ultrasound therapy: The VIP protocol

**Lisley Viana** | Texas Health Presbyterian Hospital Dallas | USA

Title: The Scottish burden of wounds

**Jenni MacDonald** | NHS Lothian | UK

Title: Topical phenytoin effects on palatal wound healing

**Anuja Doshi** | University of New England | USA

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## Use of internally validated *in vitro* biofilm models to assess antibiofilm performance of silver-containing gelling fibre dressings

Hannah Thomas, Liam Purcell, Louise Suleman and Samantha Westgate

Perfectus Biomed Group, UK

**Objective:** To assess the efficacy of five silver-containing gelling fibre wound dressings against single-species and multi-species biofilms using internally validated, UKAS-accredited *in vitro* test models.

**Method:** *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albicans* single- and multispecies biofilms were cultured using centres for disease control (CDC) biofilm reactors and colony drip flow reactors (CDFR). Following a 72-hour incubation period, the substrates on which biofilms were grown were rinsed to remove planktonic microorganisms and then challenged with fully hydrated silver-containing gelling fibre wound dressings. Following dressing application for 24 or 72 hours, remaining viable organisms from the treated biofilms were quantified.

**Results:** In single-species *in vitro* models, all five antimicrobial dressings were effective in eradicating *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilm bacteria. However, only one of the five dressings (Hydrofiber technology with combination antibiofilm/antimicrobial technology) was able to eradicate the more tolerant single-species *Candida albicans* biofilm. In a more complex and stringent CDFR biofilm model, the hydrofiber dressing with combined antibiofilm/antimicrobial technology was the only dressing that was able to eradicate multispecies biofilms such that no viable organisms were recovered.

**Conclusion:** Given the detrimental effects of biofilm on wound healing, stringent *in vitro* biofilm models are increasingly re-

quired to investigate the efficacy of antimicrobial dressings. Using accredited *in vitro* biofilm models of increasing complexity, differentiation in the performance of dressings with combined antibiofilm/antimicrobial technology against those with antimicrobial properties alone was demonstrated.

### Recent Publications

1. Mark G Rippon, Alan A Rogers, Samantha Westgate. Treating drug-resistant wound pathogens with non-medicated dressings: An *in vitro* study. *J Wound Care*. 2019 Sep 2;28(9):629-638.
2. Samantha Westgate, Mark G Rippon, Laura Sellars, et al. Treating drug-resistant wound pathogens with non-medicated dressings: an *in vitro* study. *J Wound Care*. 2019 Sep 2;28(9):629-638.
3. Samantha Westgate, Mark G Rippon, Kathryn M Styles, et al. Effectiveness of a non-medicated wound dressing on attached and biofilm encased bacteria: Laboratory and clinical evidence. *J Wound Care*. 2018 Mar 2;27(3):146-155.

### Speaker Biography

Hannah joined Perfectus Biomed in 2013 and has been integral to the journey and growth of the company. Starting as a laboratory technician, Hannah has progressed through the company and has held roles including quality manager, operations manager and head of cell culture & virology. Hannah became commercial senior manager in 2021. During her time with the company, she has led the team to be first in the world to develop and accredit biofilm test methods to ISO 17025, led collaborative projects to conduct ground breaking research into wound care, and played a critical role in obtaining GLP accreditation. Out of work, Hannah enjoys hiking with her family and loves to travel.

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## Healing rate of chronic and subacute lower extremity ulcers treated with contact ultrasound and noncontact ultrasound therapy: The VIP protocol

Lisley Viana and Matthew Pompeo

Texas Health Presbyterian Hospital Dallas, USA

**Background:** Contact and noncontact ultrasound are types of low frequency ultrasonic wound therapies.

**Objective:** To see if healing rates are accelerated when both therapies are utilized.

**Materials and Methods:** The viana-pompeo (VIP) ultrasound protocol consists of contact ultrasound followed by noncontact ultrasound. A total of 11 subjects (24 chronic or subacute lower extremity wounds) were enrolled for treatment 3 times weekly for 12 weeks. Of the 11 subjects, 6 finished the protocol (12 wounds). Subjects started with contact ultrasound for debridement at 25 kHz. Once the wound had  $\leq 20\%$  of slough, therapy was switched to noncontact for cellular stimulation at 40 kHz. Wounds were divided into 2 groups: A, wound duration between 4 and 21 weeks; and B, duration  $\geq 47$  weeks.

**Results:** Group A (4 wounds): All wounds improved in area and epithelialization; 75% reached  $> 99\%$  epithelialization in  $\leq 12$  weeks. All wounds had 93% to 100% volume reduction. Granulation was 100%, and by visit 10, all wounds had 0% slough. Group B (8 wounds): 50% of wounds improved with 50% volume reduction; all wounds increased granulation, with 50% achieving 75% to 100%; 62% increased epithelialization, and 75% had 85% to 100% slough reduction. There was a strong positive correlation between wound age and healing time ( $r=0.94$ ).

**Conclusions:** Both groups benefited from the VIP Protocol with wound closure or wound bed preparation for graft. Results seem to favor an earlier start of the protocol and indicate that both therapies are not exclusionary but rather complementary.

### Recent Publications

1. Lisley Viana, Matthew Pompeo. Healing rate of chronic and subacute lower extremity ulcers treated with contact ultrasound followed by noncontact ultrasound therapy: The VIP ultrasound protocol. Wounds. 2017 Aug;29(8):231-239.
2. M Baran Pouyan, M Nourani, M Pompeo. Sleep State Classification Using Pressure Sensor Mats. Annu Int Conf IEEE Eng Med Biol Soc. 2015 Aug;2015:1207
3. M Baran Pouyan, S Ostadabbas, M Pompeo et al., Classifying bed inclination using pressure images. Annu Int Conf IEEE Eng Med Biol Soc. 2014;2014:4663-6.

### Speaker Biography

Lisley Viana has completed her master's degree in physical therapy from Texas Woman's University, USA. She currently works for Texas Health Resources at the Presbyterian Hospital of Dallas Outpatient Wound Clinic, USA. She has over 16 years of experience in wound care and ultrasonic therapy. Her clinical experience led her to envision an original protocol to use ultrasound therapy in a way that had never been reported before in a published study. She was the principal investigator for the VIP protocol study.

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 Notes:

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## The Scottish burden of wounds

Jenni MacDonald<sup>1,2</sup>

<sup>1</sup>NHS Lothian, UK

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The prevalence of wounds and the cost of treating them are increasing year on year. Improving the quality of wound care will improve patient outcomes and is a financial necessity. The lens of profound knowledge is a tool that can be used to support quality improvement and identify where action is needed. It allows exploration of an organisation through four aspects appreciate the system, understanding variation, psychology, and theory of knowledge and working on all four aspects simultaneously is believed to increase the likelihood of achieving improvement. Improvements at and between all levels microsystem (such as frontline services), mesosystem (health boards) and macrosystem (NHS Scotland) would reduce variation in practice and prove to be both clinically and cost-effective. Given the rapidly growing population of people with unhealed wounds, wound care needs to be valued at all system levels and be adequately resourced.

### Recent Publications

1. Jenni MacDonald, Maggie Harkness, Fiona Stewart. Pressure ulcer prevention; reflections of co-production in practice. Wound Care Today. 2022 May.
2. Jenni MacDonald, Sandoz H et al. Pressure ulcers: quality improvement. Nursing Times [supplement]; 2021, 117: 3.

3. Jenni MacDonald, The Royal Marsden Manual of Clinical Nursing Procedures 10th Ed. Chapter 18 Wound Management

### Speaker Biography

Jenni MacDonald is the nurse consultant tissue viability in NHS Lothian, Edinburgh, Scotland. She has responsibility in acute, primary & community care. She completed her Bachelor of Science degree in tissue viability in 2011, her Master of Science degree in skin integrity in 2017 and has been heavily involved in several wound care publications since then. Jenni has a background in both community and hospital tissue viability nursing spanning a decade and is the founder of the TVN2 gether UK wide specialist nurse network. Graduating again in 2018, Jenni also holds a Darzi Fellowship which is a prestigious, high profile programme designed to develop leaders to undertake complex change initiatives within their organisations. Jenni is ambitious and innovative and often prominent on social media with her latest campaign. As the creator of the red dot campaign, Jenni has observed first-hand the impact of collaboration across professional and geographical borders. With a passion for quality improvement and delivering better patient outcomes and the strong belief that empowering and strengthening the tissue viability specialist nurse workforce is key to achieving high quality wound care services, Jenni's 2021 appointment as professor of wound healing at Birmingham City University, England, will be significant in achieving this vision of an empowered workforce.

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## Topical phenytoin effects on palatal wound healing

Anuja Doshi<sup>1</sup>, James W McAuley<sup>2</sup> and Dimitris N Tatakis<sup>1</sup>

<sup>1</sup>University of New England, USA

<sup>2</sup>The Ohio State University, USA

**Introduction:** The proven clinical benefits of autogenous soft tissue grafts are countered by associated donor site morbidity, including occasional healing delays, indicating a need to improve donor site outcomes. Studies have shown improved acute and chronic wound healing following phenytoin (PHT) application in various tissues. The aim of our prospective split-mouth clinical trial was to assess clinical, histological and patient outcomes following topical PHT treatment of experimental palatal wounds.

**Methods:** Systemically healthy adult nonsmokers were recruited. One 6 mm diameter wound (posterior) and one 4 mm diameter wound (anterior), each 1-1.5 mm deep, were created on both sides of the palate using custom stents and biopsy punches. Wounds on one randomly chosen side received PHT (10% phenytoin USP in 30% poloxamer gel; test) and on the other received carrier alone (30% poloxamer gel; control). Participants were blinded to treatment allocation. Customized stents were worn after medication application for wound protection.

**Results:** 20 participants completed all visits. 30% of the participants reported more pain on control side than the PHT side at D1 ( $p=0.014$ ). PHT treated sites were more likely to not exhibit swelling ( $OR=9.35$ ;  $p=0.009$ ) and to not experience pain on palpation ( $OR=6.278$ ;  $p=0.007$ ). PHT also had a significant and time-dependent effect on granulation tissue appearance ( $p=0.004$ ). Overall, the healing score index was significantly higher on PHT side at Day 5 ( $p=0.037$ ) and Day 21 ( $p=0.003$ ). Histologically, there was no significant difference

between control and PHT in superficial wound contraction at any time point ( $p\geq 0.853$ ). The results of the present study, the first one to report on the use of topical PHT as palatal wound treatment regimen, indicate that PHT application improved clinical outcomes on palatal wounds that model free gingival graft donor sites.

### Recent Publications

1. Doshi A, McAuley JW, Tatakis DN. Topical phenytoin effects on palatal wound healing. *J Periodontol.* 2021; 92: 409–418.
2. Wang Y, Doshi A, Tatakis DN. Phenytoin Effects on Palatal Wound Healing: Selective Gene Expression Analysis. *J Dent Res (Spec Iss 99)*: 3593.
3. Zachariadou C, Doshi A, Kolli T, Chavez M et al., DDR1 Localizes to Epithelial Leading Edge During Palatal Wound Healing. *J Dent Res (Spec Iss 99)*:0967.

### Speaker Biography

Anuja Doshi received her dental degree from Government Dental College & Hospital in Mumbai, India, and her MS and certificate in periodontics & moderate sedation from the Ohio State University (OSU) College of Dentistry. Upon graduation, she joined the University of New England as a full-time faculty and is currently the director of predoctoral periodontics. Dr. Doshi has presented her research at the American Academy of Periodontology (AAP) meetings and at IADR/AADR. She is also a published author in the *Journal of Periodontology* and serves as the peer reviewer for *Clinical Advances in Periodontics* and the *Journal of Dental Education*. In 2019 when she was awarded the prestigious Dr. D Walter Cohen Teaching Award, and in 2020 with the outstanding teaching and mentoring in periodontics award from AAP Foundation.

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## Plastic & Reconstructive Surgery | Tissue Regeneration | Diabetic Wound Care | Surgical Wound Care



Chair

**Zhanna Yusova**

Federal State Budgetary Institution of the  
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### Session Introduction

Title: Rationale for the use of Nd: Yag laser for the prevention of cicatricial complications of postoperative surgical wounds

**Zoya Evsyukova** | MSMU n/a. Evdokimov | Russia

Title: Local management of diabetic foot ulcers with a polyabsorbent TLC-NOSF dressings – A real-life pilot study in real life from Kuwait: Emerging and innovative approaches for wound healing and tissue regeneration

**Mariam Alessa** | Urgo Medical | France

Title: Clinical case of complications after the injection lipolysis procedure

**Aija Korenevskaya** | Peoples' Friendship University of Russia | Russia

Title: The global vascular guidelines "PLAN". How Wifl classification and GLASS can help in an individualized clinical or surgical decision-making?

**Lorena De Oliveira Cerqueira** | Federal University of Espirito Santo | Brazil

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## Rationale for the use of Nd:Yag laser for the prevention of cicatricial complications of postoperative surgical wounds

Zoya Evsyukova

MSMU n/a. Evdokimov, Russia

After the review of articles describing the studies of scar formation, it is possible to conclude that angiogenesis is one of the main processes in the second and third phases of the wound healing process. On the basis of the reviewed articles appeared a hypothesis about the possibility of correction of angiogenesis by selective coagulation of the maturing scar vessels, without disturbing the processes of proliferation and epithelialization. Nd:YAG lasers are used to work with vascular formations in medicine. Nd:YAG lasers have a small absorption in melanin and expressed in hemoglobin. This type of laser is mainly used as a treatment of vascular pathologies of the skin, laser treatment of different inflammatory dermatoses and in the phlebology. Nd:YAG lasers allow us to transfer a significant energy flow to the vessel without causing damage to the surrounding tissues, there is no risk of skin burns with effective vascular coagulation.

**The purpose of the study:** To find optimal protocols of the Nd-Yag laser usage.

As an experimental proof of our hypothesis, we conducted several treatment procedures. We treated a group of 10 patients, who previously underwent surgical intervention with usual wound suturing. The patients were divided into 2 groups: 1<sup>st</sup> group: patients who underwent laser treatment after operations; 2<sup>nd</sup> group: patients who were followed up after operations by the traditional method of wound healing.

**Results:** In the 1<sup>st</sup> group, we observe a faster resolution of postoperative edema in the suture area, as well as a lesser severity of hyperemia. Within a month, sessions of laser treatment of the suture area were performed, which made it possible to reduce the area of scars, and their color practically did not differ from the color of the surrounding skin. Ultrasound

examination in the area of scars in both groups revealed that its structure and dimensions in the 1<sup>st</sup> group is closer to intact skin, compared to the results in the control group.

**Conclusions:** The data obtained during this trial can show the direct correlation between angiogenesis and the process of scar formation, as well as the possibility of controlling this process by local impact on the wound with a Nd:Yag laser. The advantage of the proposed method is its availability, ease of use, lack of systemic effects and side effects, as well as high efficiency and relatively low cost.

### Recent Publications

1. Evsyukova ZA, Glushko AV. Protocol of conservative treatment of persistent edema after rhinoplasty, Journal of Nursing & Healthcare. 2022; 7(2): 01-04.
2. Z Evsyukova, E Prazdnikov, F Farhat. The feasibility of studying neodymium laser effects on wound healing in mice. Design of a preclinical experiment. Journal of Nursing & Healthcare. 2022; 7(2): 01-06.
3. Daniel R K, Palhazi P. Ligaments and nasal tip in rhinoplasty: An anatomical study. Aesth Surh J, 2018;38(4):357-68..

### Speaker Biography

Zoya Evsyukova is a plastic surgeon, dermatologist, medical director of the Scientific and Practical Center for Aesthetic Medicine. Zoya graduated from the First Moscow State Medical University named I.M. Sechenov in 2012, since then she has been actively involved in dermatology, namely the problems of regeneration, scar formation and scarless methods of wound healing. Currently investigating the effect of a Nd:Yag laser on the healing of postoperative wounds in animals in an experiment and in humans in clinical practice. She has several patents for the invention of methods for the treatment of cellulite, rosacea, author's protocols for the treatment of complications in plastic surgery. Author of articles on surgery, dermatology, regenerative medicine.

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## Local management of diabetic foot ulcers with a polyabsorbent TLC-NOSF dressings – A real-life pilot study in real life from Kuwait: Emerging and innovative approaches for wound healing and tissue regeneration

Mariam Alessa<sup>1</sup>, Naser Alhumaidi<sup>2</sup>, Abdul Aziz Alshaheen<sup>2</sup> and Emilio Galea<sup>1</sup>

<sup>1</sup>Urgo Medical, France

<sup>2</sup>Farwaniya Hospital, Kuwait

Chronic wounds are an international and regional concern affecting many patients, demanding substantial resources from healthcare systems. Managing patients with these wounds is costly in terms of time and resources required, not forgetting the detrimental impact on the quality of life of these individuals. Moreover, diabetic foot problems are very common throughout the world, and their recurrence is high. In 2016, the World Health Organization (WHO, 2022) reported that 14.7% of the population of Kuwait are suffering from diabetes, with very high percentages of overweight, obese and inactive individuals. It is inevitable that many of these individuals suffer and/or will suffer in the future from diabetes-related foot ulcers and complications, and the management of these wounds is complex. The authors reviewed the evidence behind a local treatment indicated for chronic wounds and specific in neuropathic diabetic foot ulcers. In view of the high level of evidence regarding this local treatment, a pilot study was conducted in 2021 to analyse the feasibility of a larger-scale observational study. The article highlights the results of the initial pilot and discusses the feasibility of conducting further research to justify implementation of technology lipido-colloid

nanooligosaccharide factor (TLC-NOSF) dressings in the local management of patients with diabetic foot ulcers in Kuwait.

### Recent Publications

1. Naser Alhumaidi, Mariam Alessa, Abdul Aziz Alshaheen et al., Local management of diabetic foot ulcers with a polyabsorbent TLC-NOSF dressings — a real-life pilot study in real life from Kuwait. *Wounds Middle East*, 2022, Vol 8 Issue 1.
2. Mariam Alessa, Deborah Whitham and Chris Morris-Roberts. The Effectiveness and Safety of Cannabis/Cannabinoids for Painful Diabetic Neuropathy: A Systematic Review. *Global Scientific Research Journal Diabetes*, 1(1), 2018, pp. 9-20.
3. Mariam Alessa. Podiatrist Independant Prescribing in Malta. *Association of Podiatrists in Malta (APM)*, (2015)

### Speaker Biography

Mariam Alessa has completed her MSc in podiatry with diabetes from Brighton University, UK. She is the only practicing diabetes specialist podiatrist at the Ministry of Health, Kuwait. Currently, PhD candidate in University of Western Australia, Australia. She has particular research interest in diabetic foot disease care for the high-risk foot in Middle East and North Africa (MENA) region.

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 Notes:

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## Clinical case of complications after the injection lipolysis procedure

**Aija Korenevskaja**

Peoples' Friendship University of Russia, Russia

Injectable lipolysis is a common and effective technique in aesthetic medicine. However, there are complications, where, in this case, the formation of pronounced inflammatory infiltrates with abscess formation, angioedema will be considered. For the purpose of regeneration of tissue and prevention of severe fibrosis, injection, topical agents and drainage procedures were used.

### Recent Publications

1. Ostretsova M N, Korenevskaya A, Kasikhina E I, Zhukova O V. Experience of applying a multi-component gel based on troxerutin, heparin sodium and dexpanthenol in the rehabilitation of patients after cosmetic procedures. *Meditinskii sovet = Medical Council*. 2021; (8):53–60.
2. Sinelnikov M E, Babaeva Yu V, Startseva O I, Burdin S A. Acute vascular complications after facial contouring. Mechanisms of development, methods of prevention and treatment. *Golova i*

*sheya*. *Rossiyskiy zhurnal = Head and Neck. Russian Journal*. 2020; 8(1):63–68.

3. Zhuchkov M V, Bolshakova E E, Sonin D B, Zhuchkova U V. Prevention of Hematomas in the Induction of Injection Cosmetology Interventions. *Vestnik dermatologii i venerologii*. 2018;94(6):31–36.

### Speaker Biography

Aija Korenevskaja is a assistant in the department of dermatovenerology and allergology with the course in Immunology Institute of the Medical Institute, Peoples' Friendship University of Russia. She is graduated from Riga Stradiņš Universitēt (European Union) and completed residency in dermatovenerology of the RUDN, retraining in cosmetology of the RUDN, internships with the world's leading specialists. She is a speaker and participant of several international congresses, including dissection anatomical cadaver courses. International trainer in injection techniques and cosmeceuticals. Author of numerous popular scientific publications. It has its own unique techniques with elements of gerontology.

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## The global vascular guidelines “PLAN”. How Wifl classification and GLASS can help in an individualized clinical or surgical decision-making?

**Lorena de Oliveira Cerqueira**

Federal University of Espirito Santo, Brazil

The Wifl classification, a new classification system for the threatened lower limb, has been proposed by the Society for Vascular Surgery and it is based on the three main factors that have an impact on limb amputation risk: Wound (W), ischemia (I) and foot infection (fi). This classification can predict the risk of amputation at 1 year and the need for limb revascularization. It was endorsed by the global vascular guidelines (GVG), which proposed a new global anatomic staging system (GLASS). This scheme has three final stages of complexity for intervention, that involves defining a preferred target artery path (TAP) and then estimating limb-based patency (LBP). Together, Wifl and GLASS help to define the preferred revascularization strategy, according to “PLAN” concept, what is a three-step integrated approach, based on patient risk estimation, limb staging and anatomic pattern of disease.

### Recent Publications

1. Lorena de oliveira Cerqueira et al., Wifl classification: the Society for Vascular Surgery lower extremity threatened limb classification system, a literature review. J. vasc. bras.,Porto Alegre, v. 19, e20190070, 2020

2. Eliud Garcia Duarte Junior, Lorena de Oliveira Cerqueira, Jose Roberto Cerqueira. A Utilizacao da Classificacao Wifl em Pacientes Diabéticos com Isquemia Crítica. Oliveira, Julio Cesar Peclat. In: Isquemia dos membros Inferiores. São Paulo: DiLivros, p. 591-598, 2020.
3. Lorena de oliveira Cerqueira et al., Tropicurus torquatus (Squamata: Tropicuridae) as a bioindicator of heavy metal (aluminum and zinc) pollution in Vila Velha, Brazil. Environmental Science and Pollution Research, v. 25, p. 1210-1219, 2018.

### Speaker Biography

Lorena de Oliveira Cerqueira is an honors graduate medical doctor from Vila Velha University, School of Medicine, where she also started her studies about Wifl classification for lower extremity threatened limb. She is currently a second-year general surgery resident at Federal University of Espirito Santo and member of the Brazilian Society of Angiology and Vascular Surgery (SBACV). She has some publications about Wifl classification, including an literature review, published in the Brazilian Vascular Journal and some book chapters, in addition to several classes and exhibitions on this subject. At the moment, she is working in two new book chapters about lower extremity threatened limb adequated classification.

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 Notes:

## Wound Care Biomaterials | Wound Dressings | Wound Healing | Regenerative Medicine



Chair

**Hannah Thomas**

Perfectus Biomed Group | UK

### Session Introduction

Title: An early atraumatic experience of silicone gel mesh dressing in burn wound care

**Soo Jia Ying** | University Putra Malaysia | Malaysia

Title: Delivering microRNA-31 via electrospun nanofibres for the treatment of non-healing wounds

**Monika Ziminska** | Queen's University Belfast | UK

Title: Delivery of a microRNA 'cocktail' by electrospun PVA/alginate/ciprofloxacin nanofibres: A novel genetic nanomedicine for impaired wound healing

**Adrian Dario Juncos Bombin** | Queen's University Belfast | UK

Title: Treatment of patients with gross violation of facial expressions for a period of more than 2 years: Reinnervation of the facial nerve

**Ekaterina Orlova** | Federal State Budgetary Institution NMSCO FMBA of Russia | Russia

Title: Treatment of facial palsy patients in accordance with BMJO concept

**Dmitriy Yudin** | Federal State Budgetary Institution NMSCO FMBA of Russia | Russia

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## An early atraumatic experience of silicone gel mesh dressing in burn wound care

Soo Jia Ying, Nor Hanipah Z and Farrah-Hani Imran  
University Putra Malaysia, Malaysia

**Introduction:** Dressing burn wounds can be painful especially in children. Conventional dressings may adhere to wounds that traumatized the newly formed granulation tissues and this results in substantial pain and contact bleeding at times. Therefore, it is essential to design a new wound care product that can address these issues during burn wound dressings. These case series aim to evaluate the use of silicone gel-based dressing (SI-AID) in burn wound management.

**Case Series:** Case 1: A 3-year-old boy was scalded and sustained 5% partial-thickness burn over the anterior chest wall. SI-AID dressing was applied. The wound had epithelialized on day 7 post- burn injury. Case 2: A 22-year-old lady presented for scalding burns injury and sustained 5% partial-thickness burn over the bilateral upper thigh and inguinal region. SI-AID was applied as burn dressing and full epithelialisation was achieved on day 14. Case 3: A 54-year-old gentleman was involved in a motor vehicle accident. He was trapped inside the flaming automobile for a few minutes after the collision. He sustained 11% partial-thickness burn over the face, bilateral forearm, left thigh and foot. SI-AID was applied to forearms, thigh and foot. Wounds on the bilateral forearm and left thigh epithelialized after two dressing cycles (day 11). The burn on the medial aspect of the right foot required 4 cycles of dressing (total of 23 days) to completely epithelialize. All three patients tolerated SI-AID well, including the toddler. None of the patients required extra analgesics or sedation during dressing change. Moreover, upon removal, there

were no evidence of trauma to the surrounding skin.

**Conclusion:** SI-AID is a silicone gel-based dressing that can be used as a primary partial thickness burn wound dressing. It is an atraumatic and virtually pain-free burn dressing with good epithelisation outcomes. A larger-scale randomized control study is needed to conclude the cost- effectiveness and wound care outcomes using SI-AID as burn dressing.

### Recent Publications

1. Sood A, Granick MS, Tomaselli NL. Wound Dressings and Comparative Effectiveness Data. *Adv Wound Care (New Rochelle)*. 2014;3(8):511-529.
2. Cutting K, White R, Hoekstra H. Topical silver-impregnated dressings and the importance of the dressing technology. *Int Wound J*. 2009;6(5):396-402.
3. Kim, H.; Shin, S.; Han, D. Review of history of basic principles of burn wound management. *Medicina* 2022, 58, 400

### Speaker Biography

Soo Jia Ying has completed her specialty training in general surgery at the National University of Malaysia. She is also a lecturer at University Putra Malaysia. Despite being general surgeon, she also shown interest in plastic and reconstructive surgery. She has spent approximately 2 years training under an established plastic and reconstructive team in a quaternary referral centre and level 1 trauma centre. She has a great passion in medical charity. With the hope of making medical services more accessible to the sick and impoverished, she often travelled to provide free consultation and wound dressing services.

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 Notes:

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## Delivering microRNA-31 via electrospun nanofibres for the treatment of non-healing wounds

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MicroRNA (miR) are post-transcriptional regulators of multiple genes and associated pathways, thus have excellent potential for chronic wound treatment. miR-31 was found to be downregulated in impaired wound healing in patients with diabetes and those over that age of 65. These two cohorts are highly prone to chronic wound development, therefore upregulation of miR-31 presents as a promising wound healing therapy. To carry the therapeutic cargo into the cells, a novel peptide delivery system CHAT was utilised to create nanoparticles (NPs) with plasmid encoding for miR-31 (pmiR-31). The delivery system resulted in successful transfection of keratinocyte, endothelial, and fibroblast cells and knockdown of miR-31 target genes: Epithelial membrane protein-1 (EMP-1) and factor inhibiting hypoxia-inducible factor-1 (FIH-1), resulting in significant improvements in cellular functionality with regards to migration, proliferation, and angiogenesis. Electrospinning of hydrogels in a form of nanofibres has been identified as an advantageous platform for the development of wound dressing. Here, a crosslinked PVA nanofibre patch facilitated temporal delivery of the NPs. The efficacy of the CHAT/pmiR-31 loaded nanofibres was validated *in vitro* and *in vivo* to assess its functionality, in addition to subject to biocompatibility assessment. The device resulted in transfection in fibroblast, endothelial, and keratinocyte cell lines, and successful gene knockdown of the targets of miR-31 (EMP-1 and FIH-1).

*In vitro*, functionality improvements were evident, which translated into significant improvements *in vivo*. Treatment with the loaded nanofibres in the full thickness wound model in C57BL/6N mice resulted in thicker epidermal and stratum corneum layers, heightened blood vessel density and size, and exhibited biocompatibility comparable to commercial dressing controls.

### Recent Publications

1. EM McErlean, M Ziminska, C M McCrudden, et al. Rational design and characterisation of a linear cell penetrating peptide for non-viral gene delivery. *Journal of Controlled Release* 2021, 330.
2. M Ziminska, EM McErlean, N Dunne, H O McCarthy. Synthesis and evaluation of a thermoresponsive degradable chitosan-grafted-PNIPAAm hydrogel as a "smart" gene delivery system. *Materials* 2020, 13.
3. Z Guo, N Jiang, J Moore, C McCoy, M Ziminska, et al. Nanoscale Hybrid Coating Enables Multifunctional Tissue Scaffold for Potential Multimodal Therapeutic Applications. *ACS Appl. Mater. Interfaces* 2019, 11

### Speaker Biography

Monika has completed her PhD from School of Mechanical & Aerospace Engineering, Queen's University Belfast University, UK. She is a research fellow in the School of Pharmacy, QUB, UK developing nanoparticle delivery systems and nanocomposite for wound healing and bone regeneration.

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 Notes:

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## Delivery of a microRNA ‘cocktail’ by electrospun PVA/alginate/ciprofloxacin nanofibres: A novel genetic nanomedicine for impaired wound healing

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<sup>2</sup>Dublin City University, Ireland

Delays in wound healing are a significant financial burden to the NHS with annual costs estimated to be £3.2 billion. Wound healing is regulated by microRNAs (miRs), which impact multiple aberrant genetic pathways. miR-31 and miR-132 can promote re-epithelialisation, neoangiogenesis, and anti-inflammatory responses by targeting different molecular pathways. In this study, we have encapsulated single-stranded RNA with the sequence of these miR into nanoparticles (NP) by electrostatic interaction with RALA, a novel 30-mer amphipathic pH-responsive peptide that is designed to overcome biological barriers. A wound dressing with potential for NP loading and delivery has been fabricated using electrospinning. Polyvinyl alcohol was chosen as the carrier polymer owing to its ability to be electrospun, sodium alginate was incorporated for its wound healing ability and ciprofloxacin was added as a wide-spectrum antibiotic. The NP cocktail has been proven to efficiently enter cells with no cytotoxicity and to upregulate miR levels. Our NP-loaded electrospun nanofiber technology has demonstrated *in vitro* antimicrobial activity against *Pseudomonas aeruginosa* and *Staphylococcus aureus*, as well as biocompatibility and the promotion of keratinocyte

migration in wound scratch assays. Treatment with the loaded nanofibres in a full thickness wound model in C57BL/6N mice resulted in thicker epidermal and stratum corneum layers, as well as a heightened blood vessel density and size.

### Recent Publications

1. Mulholland E J. et al. Delivery of RALA/siFKBP1 nanoparticles via electrospun bilayer nanofibres: An innovative angiogenic therapy for wound repair. *J Control Release*, (2019) 316:53-65
2. Juncos Bombin, A D. et al. Electrospinning of natural polymers for the production of nanofibres for wound healing applications. *Materials Science and Engineering: C* (2022)114, 110994
3. Mulholland E J. et al. Design of a novel electrospun PVA platform for gene therapy applications using the CHAT peptide. *Int J Pharm*, (2021) 598:120366.

### Speaker Biography

Adrian Dario Juncos Bombin, at the age of 26 years, is a final year PhD student and early stage researcher at Queen’s University Belfast, UK under the Marie Skłodowska-Curie Actions H2020 programme. He is also a research assistant within professor McCarthy’s nanomedicine group based in the School of Pharmacy at QUB. Each of his publications have been cited over 40 times.

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## Treatment of patients with gross violation of facial expressions for a period of more than 2 years: Reinnervation of the facial nerve

Ekaterina Orlova and Yudin D K

Federal State Budgetary Institution NMSCO FMBA of Russia, Russia

**Introduction:** Nowadays choice of surgical technique depends on the duration of the face paralysis. In cases in which longstanding muscle dysfunction more than 2 years the patient is not suitable for muscle reinnervation because of significant muscle degeneration atrophy. Electromyography (EMG), electroneuromyography (SGKN), ultrasonography (USG) is used to assess differences between severe dysfunction and total paralysis. According to the diagnostic tests, muscle tone remains even after more than 2 years of severe dysfunction. However, the impulse strength conducted along the facial nerve is not sufficient for visually muscle contractions. In case of longstanding paresis, late reconstruction can be provided by “end-to-side” facial nerve coaptation with the masseter nerve (V3). This technic achieves excellent results, restoring involuntary, independent, and spontaneous facial expression.

**Objective:** Development and implementation principles and techniques of facial nerve reconstruction for the patient suffered from severe facial paresis more than 2 years

**Materials and methods:** For the period from 2016 to September 2021, 11 patients suffered from severe facial paresis more than 2 years were examined and operated at the Federal State Budgetary Institution NMICCO FMBA of Russia (The Department of Maxillofacial and Plastic Surgery).

**Results:** Preoperative examination such as SGKN, USG are often helpful in differentiating severe facial nerve dysfunction and total paralysis in case of the visual absence of muscle contractions. Restoring movement of facial muscles is achieved providing “end-to-side” facial nerve coaptation with the masseter nerve. Therefore, functional and aesthetic goals is reached, restoring social activity and eliminating loss of vision.

**Conclusion:** It is necessary to differentiate severe paresis from paralysis of mimic muscles using additional objective tests. Masseter nerve-based facial paresis reconstruction is a

favorable surgical option. As a result, it increases the impulse strength conducted along the facial nerve. Achieving the facial nerve integrity is a basic principle of successful outcomes in facial reanimation surgery. A comprehensive approach and an integrative rehabilitation improve facial function in patients with long-standing paresis.

### Recent Publications

1. Finsterer J. Management of peripheral facial nerve palsy. *Eur Arch Otorhinolaryngol.* 2008;265(7):743-752.
2. Morales-Chávez M, Ortiz-Rincones MA, Suárez-Gorriñ F. Surgical techniques for smile restoration in patients with Möbius syndrome. *J Clin Exp Dent.* 2013;5(4):e203-e207.
3. Grossard C, Chaby L, Hun S, Pellerin H. et al, Children Facial Expression Production: Influence of Age, Gender, Emotion Subtype, Elicitation Condition and Culture. *Front. Psychol.* 2018: 9:446

### Speaker Biography

Ekaterina Orlova graduated from Moscow State University of Medicine and Dentistry (MSUMD) in 2012. She underwent residency in clinical studies with a specialization in maxillofacial surgery at the department of reconstructive head and neck surgery of the Federal State Budgetary Institution “Central Research Institute of Dental and Maxillofacial Surgery (CRID)” of Ministry of Healthcare of the Russian Federation. After completing her residency, she was invited to attend postgraduate studies under the supervision of Prof. A.I. Nerobeev at the Central Research Institute of Dental and Maxillofacial Surgery. She specializes in facial surgery, including reconstructive and aesthetic surgery. She studied reconstructive and plastic surgery in South Korea, interned at ASAN Hospital in Seoul in 2017. Now she is working as a staff surgeon in the department of maxillofacial and plastic surgery at Federal State Budgetary Institution “The National Medical Research Center for Otorhinolaryngology of the Federal Medico-Biological Agency of Russia” the since 2017. Dr. Orlova has patents and scientific publications, including those in foreign journals. She regularly attends and speaks at scientific conferences on maxillofacial and plastic surgery.

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## Treatment of facial palsy patients in accordance with BMJO concept

Dmitriy Yudin, Orlova E V, Prikuls V F and Gette S A

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**Introduction:** A gold standard of evidence-based facial paresis treatment is facial nerve reinnervation. However, the outcomes are not always totally satisfactory. A comprehensive rehabilitation is an important component of therapy that influenced on restoring facial expression. Successfully performed surgical part is only a tip of an iceberg. The main parts of achieving excellent results are preparing the patient for enhanced recovery after surgery and postoperative integrative rehabilitation.

Analyzing anatomic structures involved in facial expressions and undertaking additional diagnostic examinations improve the outcomes of facial reanimation surgery. Our clinical approach that is called BMJO (Brain Muscule Joint Occlusion) is comprehensive included diagnostics, perioperative planning and rehabilitation. Before planning patients undergo electromyography (EMG), electroencephalography (EEG), magnetic resonance imaging (MRI) and occlusal analysis.

Restorative medicine is based on activating the adaptive and reserve forces. These processes are directly correlated with cerebral plasticity and different antinociceptive systems that are responsible for recovery. The most operative of them is opiategic, whose mobility can be assessed by the ratio of alpha and beta brain rhythms identified by EEG. Registering brain rhythms before, during and after treatment, the degree of adherence to therapy is assessed. Moreover, increasing the level of the alpha rhythm, which contributes to the production of large-molecular endogenous opioids, leads to enhanced recovery. Providing facial nerve coaptation with the masseter nerve, it is important to assess the electrical potential of the masseter muscle. The higher potential is, the more expressive facial function would be. TMJ condition and dental occlusion influence on responsible for the action of mastication.

**Objective:** To increase the efficiency of improving facial function and quality of patient's life who suffered from facial paralysis and paresis.

Tasks:

1. Determine the relationship between brain rhythms and the patient's potential for rehabilitation in postoperative period
2. Assess the role of the masticatory muscles, TMJ and dental occlusion as a part of comprehensive rehabilitation program

**Materials and methods:** For the period from 2020 to 2021, 12 patients suffered from facial paresis and paralysis were examined according to the BMJO approach at the Federal State Budgetary Institution NMICCO FMBA of Russia (the Department of Maxillofacial and Plastic Surgery).

**Results:** Preoperative examination such as EMG, EEG and MRI are often helpful in evaluating brain potential to produce endogenous opioids, the strength of the masseter muscle and TMJ stability. It contributes to the assessment of possible outcomes. Due to the correction of unsatisfactory it is possible to achieve excellent results.

**Conclusion:** Analyzing EEG with subsequent correction of opiategic system is significantly improve the outcomes of facial paresis treatment. Providing facial nerve reinnervation using the masseter nerve is important to assess the electrical potential of the masseter muscle, TMJ condition and dental occlusion according to BMJO approach. This approach leads to achieve excellent results preparing patients for enhanced recovery after surgery and postoperative integrative rehabilitation.

### Recent Publications

1. Finsterer J. Management of peripheral facial nerve palsy. *Eur Arch Otorhinolaryngol.* 2008;265(7):743-752.
2. Morales-Chávez M, Ortiz-Rincones MA, Suárez-Gorriñ F. Surgical techniques for smile restoration in patients with Möbius syndrome. *J Clin Exp Dent.* 2013;5(4):e203-e207.
3. Grossard C, Chaby L, Hun S, Pellerin H. et al, Children Facial Expression Production: Influence of Age, Gender, Emotion Subtype, Elicitation Condition and Culture. *Front. Psychol.* 2018: 9:446

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**Speaker Biography**

Dmitry Yudin graduated from the Moscow State Medical and Dental University and completed a clinical internship at its base. Subsequent training in the specialty maxillofacial surgery was completed on the basis of the Moscow Regional Scientific Research Clinical Institute. M. F. Vladimirsky”, where, upon its completion, he worked as a staff doctor and held the position of a departmental employee. Having received a basic surgical edu-

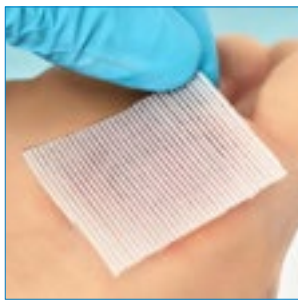
cation, he continued his studies in oral surgery and implantology, plastic surgery and cosmetology, as well as physiotherapy and rehabilitation. He has repeatedly improved his qualifications and regularly undergoes training in all areas of his professional activity in Russia and Europe. He is the author of a patent and numerous scientific articles.

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 Notes:

# Special Session

## *Wound Care 2022*



5<sup>th</sup> International Conference on  
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## Wound healing of novel pharmaceutical formulations through cytokine modulation

Sivakumar S Moni, Muhammad H Sultan, Saeed Alshahrani, Osama A Madkhali, Mohammed Ali Bakkari and Saad S Alqahtani

Jazan University, Saudi Arabia

Wound healing is a set of complex processes consisting of numerous phases such as inflammation reduction, epithelialization, angiogenesis, matrix deposition, and remodeling. Cytokines are involved in the recruitment of fibroblasts and epithelial cells because of inflammatory leukocyte stimulation, leading to granulation tissue development. Novel medicinal oil and nano formulations were developed and screened for the potential wound healing activity. The study suggested that the medicinal oil prepared from *Murraya koenigii* leaves extract and phyto oleic acid nanovesicles developed from Sargassum binder (an alga) in healing diabetic wounds have promising therapeutic effects. Both medicinal oil and nanovesicles modulated cytokine networks and aid in wound healing.

### Recent publications:

1. S S Moni, P Tripathi, M H Sultan. et al, Wound-healing and cytokine-modulating potential of medicinal oil formulation comprising leaf extract of *Murraya koenigii* and olive oil. *Braz. J. Biol.* 82; 2022.

2. Kaur P. et al, Novel nano-insulin formulation modulates cytokine secretion and remodeling to accelerate diabetic wound healing. *Nanomedicine: NBM* 2019;15:47-57
3. Riham O Bakr, Reham I Amer, Dalia Attia d, Mai M Abdelhafez, et al. In-vivo wound healing activity of a novel composite sponge loaded with mucilage and lipoidal matter of Hibiscus species. *Biomedicine & Pharmacotherapy* 135 (2021) 111225.

### Speaker Biography

Sivakumar S Moni is an assistant professor at the College of Pharmacy, Jazan University, Jazan, Kingdom of Saudi Arabia. He is an active researcher, undergoing many funded projects. His research work is on nanomedicine as targeted delivery, drug delivery, and vaccine delivery. His research work extended on newer drug design for the development of antimicrobials, anticancer, and immunomodulatory principles from the seaweed and herbs of the southwestern region of Saudi Arabia. He has more than 50 research cum review articles in peer reviewed journals.

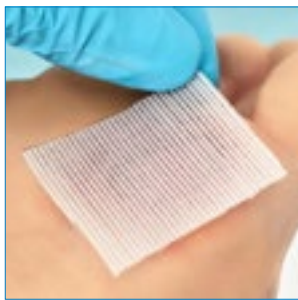
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 Notes:

# Scientific Tracks & Sessions

## April 16, 2022 | Day 02

### *Wound Care 2022*



5<sup>th</sup> International Conference on  
Wound Care, Tissue Repair and Regenerative Medicine

April 15-16, 2022 | Paris, France

## Wound Care & Pressure Injury | Wound Dressings | Diabetic Wound Care | Wound Care Management



Chair

**Mikhail Bogomolov**

First Saint Petersburg state medical University named after academician I. P. Pavlov | Russia

### Session Introduction

Title: The latest multimodality management of diabetic foot wounds

**Sangeetha Kalabhairav** | Karnataka Institute of Medical Sciences | India

Title: A set of techniques for the treatment of decubitus in patients in a chronic critical condition

**Alexey Iakovlev** | Federal Scientific and Clinical Center of Intensive Care and Rehabilitation | Russia

Title: Comparison study of bacterial profile, wound healing, and cost effectiveness in pressure injury patients using treatment honey dressing and hydrogel

**Narottama Tunjung** | Faculty of Medicine Universitas Indonesia | Indonesia

Title: The characteristic and effect of local honey compared to manuka honey for chronic wound treatment

**Nandita Melati Putri** | Faculty of Medicine Universitas Indonesia | Indonesia

Title: The progress of wound repair organization in China

**Chunmao HAN** | The Second Affiliated Hospital of Zhejiang University | China

Title: Development of an interdisciplinary healthcare team for pressure injury management: A quality improvement project

**Leena Ali Al-Mansour** | Johns Hopkins Aramco Healthcare | Saudi Arabia

Title: Autologous hair follicle transplantation in a recessive dystrophic epidermolysis bullosa (RDEB) patient: A promising way to heal recalcitrant wounds

**Tak-Wah Wong** | National Cheng Kung University | Taiwan

Title: Improving hand hygiene in a low resource setting: A nurse-led quality improvement project

**Patricia Kamanga** | Kamuzu Central Hospital | Malawi

Title: Virus-derived immune modulating proteins significantly improve wound healing

**Alexandra Lucas** | Arizona State University | USA

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## The latest multimodality management of diabetic foot wounds

**Sangeetha Kalabhairav**

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**D**iabetic foot ulcers (DFUs) are a serious complication of diabetes that results in significant morbidity and mortality. The lifetime risk of a person with diabetes developing foot ulceration is reported to be as high as 25% and a 50%–70% recurrence rate over the ensuing 5 years. Greater than 85% of major amputations in patients with diabetes are preceded by foot ulceration. Healing the diabetic foot ulcer has been a challenge. Over the past 20 years, significant research is done in this field of wound repair. The standard practices in DFU management include surgical debridement, dressings to facilitate a moist wound environment and exudate control, wound off-loading, vascular assessment, and infection and glycemic control. In addition to standard practices in DFU care, there are a wide range of agents available currently as adjuvant therapies. The adjuvant therapies include non-surgical debridement agents, dressings and topical agents, CO<sub>2</sub> laser, ultrasonic therapy, oxygen therapies, negative pressure wound therapy, hydrosurgery therapy, antibiotic beads, human growth factors, PHMB, acellular dermal matrix, lasers, split skin grafting with NPWT and many more.

### Recent publications

1. Madhu BS, Shashikumar HB, Kalabhairav S, et al. Umbilical hernia factors affecting outcome. *J. Evolution Med. Dent. Sci.* 2016;5(71):5186-5189.
2. Moore TC, Siderys H. The use of pliable plastics in the repair of abdominal wall defects. *Ann Surg* 1955;142(6):973-9.
3. Arroyo A, Garcia P, Perez F, et al. Randomized clinical trial comparing suture and mesh repair of umbilical hernia in adults. *Br J Surg* 2001;88(10):1321-3.

### Speaker Biography

Sangeetha Kalabhairav has MBBS from BMCH, Rajiv Gandhi University of Health Sciences, Karnataka, India. M.S (Gen Surgery) from Mysore Medical college and Research Institute, Mysore, Rajiv Gandhi University of Health Sciences, Karnataka, India. FDFS (Fellowship in Diabetic Foot Surgery) from Maharashtra University of Health Sciences, Mumbai, India. Sangeetha presented in ASICON, KSCASI, DFSICON and Swasthyacon conference under award category, participated as a panelist in IPACON, international webinars and diabetic foot meetings. Sub investigator in major national level clinical trial. Published original articles in journals as well magazine. Member of several associations – IMA, ASI, KSCASI, DFSI, IPA, Nail Society of India.

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## A set of techniques for the treatment of decubitus in patients in a chronic critical condition

Alexey Iakovlev<sup>1</sup>, Alexandra Iakovleva<sup>1</sup> and Alexander Shulutko<sup>2</sup>

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<sup>2</sup>I. M. Sechenov First Moscow State Medical University, Russia

One of the most important medical and socially significant problems in the world is the treatment and rehabilitation of patients with severe brain damage who are in a chronic critical condition. The consequences of severe traumatic brain injuries and acute disorders of cerebral circulation, operated neoplasms, as well as anoxic brain lesions inevitably lead to prolonged passive bed rest, persistent inability to self-care.

As it is known, patients in a chronic critical condition due to severe brain damage are at high risk of decubitus ulcers, since they have a combination of predisposing factors: on the one hand, pronounced disorders of consciousness and persistent neurological deficit; on the other hand, constantly high pressure on the integumentary tissues, displacement, friction, high humidity, microcirculation disorders and limitations of the patient's mobility. The incidence of decubitus ulcers in hospitals is still high. Decubitus ulcers in patients in a chronic critical condition are poorly treatable, often worsen or relapse, which significantly limits and slows down rehabilitation measures, increases the duration of the patient's stay in the hospital, and contributes to the development of septic complications. As part of the new scientific and clinical direction-"invasive rehabilitation of patients in need of prosthetics of vital functions", the Federal Scientific and Clinical Center for Resuscitation and Rehabilitation has developed a number of conservative and minimally invasive surgical techniques for the treatment of decubitus ulcers in patients in chronic critical condition: Nutritional status correction programs; stimulating techniques (laser technologies, electrical technologies), biostimulating techniques (compositions based on fibrin complex), and surgical methods.

### Recent publications

1. Krylov Kirill Yu, Sergeev Ivan V, Yakovleva Alexandra V, Yagubyan Ruben S, Yakovlev Alexey A, Petrova Marina V. The role of indirect calorimetry in the treatment and rehabilitation of patients in long-term unconsciousness after brain damage. Clinical nutrition and metabolism. 1, № 1, c. 10-16
2. Yakovlev A A, Shulutko A M, Osmanov E G, Gandybina E G, Gogokhia T R. Low-energy laser technology in the complex treatment of bedsores in patients with severe brain damage. Georgian medical news, Assotsiatsiia delovoi pressy Gruzii (Russian Federation), № 6, c. 7-12
3. Yakovlev A A, Shulutko A M, Osmanov E G, Yakovleva A V, Natroshvili A G, Nasirov F N, Batalova A R. Objectification of the choice of therapeutic tactics for decubital ulcers in patients in chronic critical condition due to brain damage. Moscow Surgical Journal, № 2, c. 90-97.

### Speaker Biography

Alexey Iakovlev graduated from the Moscow Institute of Medical and Social Rehabilitation in 2007 with a degree in "Medical care". Later, he studied in a clinical residency in the specialty surgery at the Russian National Research Medical University named after N. I. Pirogov, underwent professional retraining in the specialty health organization and public health, completed professional training in the specialty oncology, completed professional training in the specialties endoscopy and medical and social expertise. Valid certificate of good clinical practice. Received a diploma of higher school teacher. Work experience in medical organizations is 14 years. Head of the Research Institute of Rehabilitation of a Federal Scientific and Clinical Center of Intensive Care and Rehabilitation. Author and co-author of 37 scientific publications. 5 copyright certificates: A patent for an invention. He is a member of the regional public organization Surgical Society - Wounds and Wound Infections (Russia) and The European Pressure Ulcer Advisory Panel (Europe).

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 Notes:



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## Comparison study of bacterial profile, wound healing, and cost effectiveness in pressure injury patients using treatment honey dressing and hydrogel

Narottama Tunjung, Nandita Melati Putri, Prasetyanugraheni Kreshanti, Yulia Rosa Saharman and Ruth FM Lumbuun

Faculty of Medicine Universitas Indonesia, Indonesia

**Background:** The wound treatment of pressure injury poses great challenges and requires high cost. Manuka honey has been introduced and studied as one of the conventional dressings for pressure ulcer treatment. However, this product is expensive and not widely available. This study aims to use local product honey called Nusantara honey, to prove that the use of local honey has better healing process, bacterial profile, and cost effectiveness, compared to the standard dressing, hydrogel.

**Methods:** An experimental study was conducted in patients with pressure injury that referred to our division. Parameter of the bacterial profile was taken from deep tissue specimen. The healing process was examined using the pressure ulcer scale for healing (PUSH) tool. Cost was accumulated after all the treatment. Data was analyzed with T-Test or Mann Whitney (if the distribution is not normal), with statistical significance was define as  $p < 0.05$ .

**Results:** Of 26 wounds, 12 were randomized to hydrogel and 14 to honey dressing. Characteristics were determined by sex, age, body mass index, level of consciousness, mobilization status, immobilization etiology, comorbidities, grade and location of ulcer, hemoglobin, leukocytes, and albumin level. There was a clinically significant wound size reduction in the use of honey dressing according to PUSH Tool ( $p = 0.118$ ) compared to hydrogel. The bacterial profile and reduction were similar. Honey dressing appeared to be more cost effective in terms of dressing cost ( $p < 0.001$ ) and lower total cost.

**Conclusion:** The local honey dressing had better wound heal-

ing outcome, although it was not statistically significant. Its capability of decreasing pathogens was similar with hydrogel, with lower dressing cost. Local honey dressing could be a preferable choice as wound dressing in areas where the modern dressings were not available.

### Recent publications

1. N Tunjung and Putri NM et al. Closure of meningomyelocele defects using various types of keystone-design perforator island flaps. *Archives of Plastic Surgery*. (2021); 48:3.
2. N Tunjung and Putri NM. Keystone Flap for Reconstruction of Sacral and Ischial Pressure Injury. *Jurnal Plastik Rekonstruksi*: Vol. 8 No. 1 (2021): 3
3. Tunjung, N, Kreshanti P, Saharman, Y R, et al. 2020. Clinical Evaluation of Locally Made Flocked Swabs in Response to the COVID-19 Pandemic in a Developing Country. *International Journal of Technology*. Volume 11(5), pp. 878-887.

### Speaker Biography

Narottama Tunjung has completed his plastic reconstructive and aesthetic surgery training program from the Faculty of Medicine Universitas Indonesia. Currently, he holds the position of medical and teaching staff at the burn and wound section of plastic reconstructive, and aesthetic surgery division, Dr. Cipto Mangunkusumo Hospital, Faculty of Medicine Universitas Indonesia. He has several international publications and serves as speakers and instructors in various plastic surgery events and trainings. He has interest in the field of research of burn and wound, scar treatment, tissue repair, regenerative medicine, and surgical simulation. He is also the editor-in- chief of *Jurnal Plastik Rekonstruksi*, the most prominent plastic surgery journal in the country.

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## The characteristic and effect of local honey compared to manuka honey for chronic wound treatment

Nandita Melati Putri, Prasetyanugraheni Kreshanti, Conny Riana Tjampakasari, Tri Isyani Tungga Dewi, Narottama Tunjung, Felicia Dewi and Gina Joice Sitorus

Faculty of Medicine Universitas Indonesia, Indonesia

**Background:** Honey has been used as medicine for centuries. Manuka honey and Medihoney™ has been accepted for medical use. Research shows that they are suitable for the treatment of ulcers, infected wounds and burns. But using Manuka honey and MediHoney™ in Indonesia is still difficult due to its high cost and availability. This study aims to compare local honey (Nusantara Honey and Java Honey) and Manuka honey in the treatment of chronic wound in animal model and compare their physical and chemical component, unique manuka factor, and antibacterial effect.

**Methods:** Thirty-six rats were wounded at muscle based on the dorsum side and were given bacteria *Pseudomonas* Sp. until the wound has a chronic wound appearance and then treated with Manuka Honey, Nusantara Honey, and Java Honey. A macroscopic evaluation was observed on day 0, 3, 5, 7, 10, and 13 post wound treatment. The observed parameters were wound area, presentation of necrotic tissue, slough and granulation and were evaluated by Image J application. We also checked the honey samples for physical and chemical characteristic, the methylglyoxal as the unique manuka factor, and antimicrobial effects.

**Results:** Statistically, there was a significant difference between the three honey treatment groups on the wound area parameters on day 3-day 0 ( $p=0.021$ ) with post-hoc analysis found a significant difference between Manuka honey and Java honey ( $p=0.009$ ) and Nusantara honey and Java honey ( $p=0.03$ ) and slough presentation on day 3 - day 0 ( $p=0.025$ ) with post-hoc analysis found significant differences between Manuka honey and Java honey ( $p=0.059$ ) and Nusantara honey and Java honey ( $p=0.008$ ). The next day of treatment there was no significant difference in all macroscopic evaluation parameters. *In vitro* tests showed that Manuka honey has lower pH, higher acidity, higher viscosity, and higher sugar content compared to Indonesian

local honey, Manuka honey has higher MGO content and NPA compared to Indonesian local honey, but Nusantara honey shows has higher MGO level compared to Java honey. Manuka honey has higher antibacterial activity for *P. aeruginosa* compared to Indonesian local honey but Nusantara honey shows comparable effect with Manuka honey UMF 5+

**Conclusion:** Local honey can be used as an alternative modality for wound chronic treatment the same as Manuka Honey, but with low cost and easily available in the market.

### Recent publications

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2. N Tunjung and Putri NM. Keystone Flap for Reconstruction of Sacral and Ischial Pressure Injury. *Jurnal Plastik Rekonstruksi: Vol. 8 No. 1 (2021): 3*
3. Tunjung, N, Kreshanti P, Saharman, Y R, et al. 2020. Clinical Evaluation of Locally Made Flocked Swabs in Response to the COVID-19 Pandemic in a Developing Country. *International Journal of Technology.* Volume 11(5), pp. 878-887

### Speaker Biography

Nandita Melati Putri has completed his plastic reconstructive and aesthetic surgery training program from the Faculty of Medicine Universitas Indonesia. She then continued her fellowship program at Chang Gung Memorial Hospital Taiwan, Vancouver General Hospital Canada, The Christie NHS Cancer Center Manchester UK, and Zurich Hospital for Burns Switzerland. Currently, she holds the position of medical and teaching staff at the burn and wound section of plastic reconstructive, and aesthetic surgery division, Dr. Cipto Mangunkusumo Hospital, Faculty of Medicine Universitas Indonesia. She has more than 20 international publications and serves as speakers and instructors in various plastic surgery events and trainings. She has interest in the field of research of burn and wound, scar treatment, tissue repair, regenerative medicine.

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## The progress of wound repair organization in China

**Chunmao HAN**

The Second Affiliated Hospital of Zhejiang University, China

In 2004 we firstly set up a wound care center which guided by doctors in China. Then learning from and communicating with other experts in worldwide and uniting with scholars in domestic, we have completed three events. One is writing and publishing a wound care guiding opinions and guideline. The second is going on second epidemiological investigation on chronic wound in China. The third is hundreds training on doctors and nurses. In 2019 our National Board of Health approves to set up so-called Department of Wound Repair in some ripe hospitals in China. Dept. of Wound Repair will mainly focus on chronic wounds. Nowadays further practice on wound care is been going on in varieties of hospitals and further trainings which guided by government are going on nationwide. Four wound care training books have been published which face on doctors or nurses. During the practice on wound repair, much technology including traditional chinese medicine has been applied, new therapy such as local oxygen is also being tried and lots of academic papers published. One more thing is that we set up a platform online and offline to service the old or difficult-to-move patients with chronic wound and set up a special philanthropic foundation to help chronic wound patients.

### Recent publications

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2. Zhang L, Weng T, Wu P, Li Q, Han C, Wang X. The Combined Use of Negative-Pressure Wound Therapy and Dermal Substitutes for Tissue Repair and Regeneration. *Biomed Res Int.* 2020 Dec 4;2020:8824737.
3. Jin R, Shao J, Ho JK, Yu M, Han C. A Retrospective Multicenter Study of 1898 Liquefied Petroleum Gas-Related Burn Patients in Eastern China From 2011 to 2015. *J Burn Care Res.* 2020 Nov 30;41(6):1188-1197

### Speaker Biography

Chunmao HAN has completed his PhD at the age of 37 years from Kanazawa Medical University, Japan. He is the head and professor of Dept. of Burn and Wound Repair, The Second Affiliated Hospital of Zhejiang University, China, currently working as vice chief of National Wound Repair Training Academic Committee. He has over 100 publications that have been cited over 2000 times, and his publication H-index is 27 and has been serving as a vice editorial board chair of *Journal of Chinese Burns*.

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## Development of an interdisciplinary healthcare team for pressure injury management: A quality improvement project

Leena Ali Al-Mansour, Sharon Dudley-Brown and Abdullah Al-Shaikhi

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**Purpose:** The purpose of this quality improvement project was to create an interdisciplinary healthcare team for the management of patients with stage 3, stage 4, and unstageable pressure injuries (PIs), improve the communication among the interdisciplinary healthcare team, test the educational level of the nursing staff regarding PI management, and conduct quarterly PI prevalence surveys to decrease the rate of the hospital-acquired pressure injuries (HAPIs).

**Participants and setting:** Patients with stage 3, stage 4, and unstageable PIs in medical adult inpatient units of a private tertiary hospital located in the eastern province of Saudi Arabia were included in the study.

**Approach:** During the project period (February 21, 2017, to May 23, 2017), a healthcare team was formed consisting of a hospitalist, a plastic surgeon, a case manager, a dietitian, a physiotherapist, and wound and home health nurses. The team communication and staff adherence to the care plan were measured through an audit tool. Nurses' educational level was measured by pre- and posttest assessments. In addition, a quarterly PI survey day was conducted twice to monitor the occurrence of HAPIs and to reevaluate nursing staff knowledge of management of HAPIs.

**Outcomes:** Results showed improvement in communication within the interdisciplinary team regarding care of patients

with HAPIs, with 100% staff adherence to the plan of care. In addition, unit-based educational sessions conducted to measure staff knowledge showed a statistically significant increase ( $P < .000$ ). Although small, the HAPI rate decreased from 5.9% to 5% during this short 3-month study.


### Recent publications

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3. Matthew D, Nolan E, Sorvillo F. Pressure ulcers: more lethal than we thought? *Adv Skin Wound Care.* 2005;18(7):367-372

### Speaker Biography

Leena Ali Al-Mansour, a clinical nurse specialist in wound and ostomy care for 18 years at Johns Hopkins Aramco Healthcare. She graduated from Dammam University with a bachelor's degree in nursing from Saudi Arabia, attended Cleveland Clinic in 2007 for a wound, ostomy, and continence course, board certified as a wound care nurse (CWCN), Leena earned a master's degree from Kings College London in 2012. In 2017, Leena graduated from Johns Hopkins University with a degree of Doctoral of Nursing Practice.

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## Autologous hair follicle transplantation in a recessive dystrophic epidermolysis bullosa (RDEB) patient: A promising way to heal recalcitrant wounds

Tak-Wah Wong<sup>1,3</sup>, Chao-Chun Yang<sup>1</sup>, Chao-Kai Hsu<sup>1</sup>, Cheng-Han Liu<sup>1</sup> and Julia Yu-Yun Lee<sup>1</sup>

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**R**ecessive dystrophic epidermolysis bullosa (RDEB) is a severe hereditary blistering disease caused by mutations in the type VII collagen gene, consequencing in tenuously fragile skin prone to wounds. The chronic non-healing ulcers found in RDEB patients may ultimately lead to the notoriously complication of RDEB-associated squamous cell carcinoma (SCC) with a mortality rate of 80%. Unfortunately as of today, the perturbing and painful disease still remains incurable with no available specific treatments hitherto.

Nonetheless, we have recently reported the first ever success of healing the extensive chronic wounds found in an intermediate RDEB patient through an autograft procedure of transplanting hair follicles onto her wounds. Through an immunofluorescence study, type VII collagen was shown to be expressed along the epidermal and follicular basement membrane zone in the donor and recipient sites, and some hairs grew in the recipient sites.

The same therapy also helped to heal chronic leg ulcers in non-RDEB patients. In addition, devoid of laboratory procedures in the treatment protocol also guarantees a safe and simple operation. Autologous follicular grafting therefore appears to potentially be an effective and innovative solution for RDEB patients or patients with recalcitrant wounds.

### Recent publications

1. Ming-Hsien Lin, Julia Yu-Yun Lee, Shin-Chen Pan, and Tak-Wah Wong. Enhancing wound healing in recalcitrant leg ulcers with aminolevulinic acid-mediated antimicrobial photodynamic therapy. *Photodiagnosis and Photodynamic Therapy*. Volume 33, March 2021, 102149.
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3. Wen-Tai Chiu, Thi-Tuong Vi Tran, Shin-Chen Pan, Ho-Kai Huang, Ying-Chi Chen, and Tak-Wah Wong. Cystic Fibrosis Transmembrane Conductance Regulator: A Possible New Target for Photodynamic Therapy Enhances Wound Healing. *Advances in Wound Care*. 2 Apr 2019.

### Speaker Biography

Tak-Wah Wong works in the departments of dermatology, biochemistry and molecular biology, Center of Applied Nanomedicine, at the National Cheng Kung University Medical Center of Taiwan. He sits on the board of directors of the Taiwanese Society of Investigative Dermatology. He spent two years as a visiting scientist with professor Thomas Dougherty and Dr. Allan Oseroff's team at the Roswell Park Cancer Institute Photodynamic Therapy (PDT) Center in New York. As Taiwan's pioneer in PDT to treat skin cancer since 1999, the research of PDT in his lab has been extended from neoplastic diseases to wound healing.

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## Improving hand hygiene in a low resource setting: A nurse-led quality improvement project

**Patricia Kamanga**

Kamuzu Central Hospital, Malawi

Hand hygiene is a simple but often ignored practice in health care systems worldwide, but it is integral for nosocomial infection prevention, with many hospital acquired infections being linked to inadequate hand hygiene practice. At the burns unit in Kamuzu Central Hospital, 50% of patients were found to have acquired pseudomonas infections: one of the contributing factors being inadequate hand hygiene. This quality Improvement project was part of a course for nurses to introduce change for patient benefit, with the aim of increasing the baseline figures for hand hygiene practices and hand hygiene facilities from 37% and 22% respectively (baseline collected in November 2019). Using robust, standard QI processes, measures were put in place such as checklists to observe hand hygiene compliance and facilities, appointment of a hand hygiene committee who monitored and sustained activities of the project, procurement and distribution of handrub and placement of hand washing buckets and soap at strategic points. The project saw an increase in availability of hand washing facilities to 95.6% and hand hygiene practices increase to >80% within 6 months. The project demonstrates that low cost interventions, led by nurses, can make a real difference to practice in resource poor countries.

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2. Nejad SB, Allegranzi B, Syed SB, Ellisc B, Pittet D. Health-care-associated infection in Africa: a systematic review. *Bull World Health Organ.* 2011;89:757-765.
3. Nambiar B, Hargreaves DS, Morroni C, et al. Improving health-care quality in resource-poor settings. *Bull World Health Organ.* 2017;95:76-78.

### Speaker Biography

Patricia Kamanga is a PhD candidate at Southern Medical University majoring in public health. Patricia graduated from Kamuzu College of Nursing with a Bachelor's degree in Nursing. She started working Kamuzu Central Hospital, Malawi in 2009 as a nursing officer taking charge of orthopaedic and surgical ward. In 2014 she was promoted to senior nursing officer for burns unit and female surgical ward. In 2019 she was promoted to principal nursing officer for burns unit and surgical department. In 2017 she completed her master's degree in public health from College of Medicine. In 2019, she was awarded a scholarship by the Chinese government to pursue a doctorate degree in public health at Southern Medical University. As a nurse working in burns unit she conducted a quality improvement project on hand hygiene among health workers.

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## Virus-derived immune modulating proteins significantly improve wound healing

Alexandra Lucas, Liqiang Zhang, Jordan R Yaron, Jacquelyn Kilbourne, Kenneth M Lowe, Shelley Haydel and Kaushal Rege

Arizona State University, USA

Nonhealing dermal wounds represent major medical and financial burdens. Numerous treatments have been developed to promote wound healing in severe non healing skin wounds. Hemorrhage, clotting and associated inflammation regulate early wound healing. Viruses have developed highly potent immune modulating proteins over millions of years of evolution. We have examined two of these immune modulators in wound healing models demonstrating accelerated healing; 1) A Serine Protease INhibitor (SERPIN), Serp-1, that inhibits thrombolytic proteases and inflammation in two mouse excisional wound models and M-T7 a chemokine modulating protein, M-T7. Saline, recombinant Serp-1 or M-T7 were applied directly to wounds as single doses of 1 $\mu$ g or 2 $\mu$ g or as two 1 $\mu$ g boluses. A chitosan-collagen hydrogel was also tested for Serp-1 delivery in excisional wounds and a silk fibroin suture was also tested in incisional wounds. Wound size was measured daily for 15 days and scarring assessed by Masson's trichrome, Herovici's staining and immune cell dynamics and angiogenesis by immunohistochemistry.

Serp-1 treatment significantly accelerated wound healing but was blocked by uPAR antibody. A single application of Serp-1-loaded chitosan-collagen hydrogel or in silk fibroin overlay was effective. Serp-1 treatment of wounds increased arginase-1-expressing M2-polarized macrophage counts and peri-wound angiogenesis in the wound bed. Serp-1 improves collagen maturation and organization at the wound site. Topical treatment with recombinant chemokine modulating protein M-T7 also accelerated wound healing and with greater efficacy than Serp-1, when compared to saline treatment alone.

Healed wounds exhibited improved remodeling and collagen maturation with accelerated peri-wound angiogenesis and increased levels of TNF, VEGF and CD31. M-T7 treatment was associated with retained CCL2 levels and increased arginase-1-expressing M2 macrophages and CD4 T cells. Thus, topical treatment with Serp-1 or recombinant M-T7 promotes a pro-resolution environment in healing wounds with potential as novel treatments to improve cutaneous tissue repair.

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### Speaker Biography

Alexandra Lucas is a physician scientist at the Biondesign Institute at Arizona State University. Dr Lucas has been developing a new class of immune modulating therapeutics over the past 25 years as a professor, practicing clinician and scientist in Canada and the US. She has over 150 publications and has been funded by grants in the US and Canada as well as serving as an editorial board member and reviewer for peer reviewed journals.

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