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AARS Upcoming Event: Save the Date

As we continue to monitor the attendance at our upcoming AAD, please save the date for our **16th Annual AARS Networking Reception!**

Join us **Friday, March 25, 2022 from 6-8 PM in Boston, Massachusetts**. Registration details are to be announced, but this a great chance to learn more about our research grants, as well as an opportunity to meet our new Board of Directors and our Corporate Benefactors!

New Medical Research

Researchers define keys to recognizing ocular rosacea. January 25, 2022. DermWire, Practical Dermatology. <https://practicaldermatology.com/news/researchers-define-keys-to-recognizing-ocular-rosacea-1?c4src=news-landing:feed>

Foreign body sensation and itching were about twice as prevalent in rosacea patients than in the healthy controls. A number of eye symptoms may be more common in patients with rosacea compared to those without the skin disease, but the presence of conjunctival telangiectases may be the eye symptom most closely associated with rosacea. Findings come from a study in which researchers evaluated the right eyes of 76 rosacea patients and 113 people with no systemic or eye disorders. The examinations included slit-lamp microscope, optical coherence tomography (OCT)-assisted meibography to analyze meibomian gland function, a standardized questionnaire about eye disease, and other assessments. Results, published in International Ophthalmology, show that foreign body sensation and itching were about twice as prevalent in rosacea patients than in the healthy control subjects (53.9% vs. 24.8% and 35.5% vs. 17.7%, respectively), dryness was more than four times as common (46.1% vs 10.6%), and meibomian gland dysfunction was about two-thirds more common (52.6% vs. 31%). However, conjunctival telangiectasia was found to occur overwhelmingly in the rosacea patients alone (26.3% vs 1.8%). The researchers recommend that eye doctors use detailed slit-lamp examinations to detect conjunctival telangiectasia, especially in cases of persistent dry eye symptoms. They also noted that OCT-assisted meibography may be important for identifying and evaluating meibomian gland dysfunction. A recent study from Argentina illustrates the importance of treating ocular rosacea promptly. The eyes of 51 rosacea patients were examined by researchers, and 38 (74.5%) had signs of eye involvement. Of these, all had erythema and telangiectasia on the eyelid margin, and all but one had meibomian gland dysfunction. Fifteen patients suffered decreased visual acuity due to rosacea-related complications, including scarring and blood vessels on the cornea. Investigators reported, “a significant association between the severity of ocular findings, assessed as a diminished visual acuity due to rosacea corneal involvement,” and the presence of rosacea symptoms of the skin, including excess tissue (rhinophyma) and bumps and pimples (papules and pustules). The most common therapies given to the ocular rosacea patients in the study, published in Turk J Ophthalmol, were artificial tears, oral doxycycline, corticosteroid-antibiotic ointment, and a lid hygiene regimen. However, three patients required corneal transplants to restore their vision. The researchers recommended that special attention be paid to worsening eye symptoms during flare-ups of rosacea on the skin, and that patients should be referred to an ophthalmologist for treatment when vision is threatened. “Although rosacea is generally thought of as a skin disease, research has shown that for the great majority of rosacea patients the eyes may also be affected,” says Dr. Mark Mannis, chair of ophthalmology at the University of California-Davis and a member of the National Rosacea Society’s medical

advisory board. "In moderate to severe cases, treatment by an ophthalmologist may be especially necessary to prevent loss of visual acuity."

Single session of combined microfat and subcision in the treatment of grade 4 atrophic acne scars. Zhang X, Huang B, Yang M, et al. *J Cosmet Dermatol*. 2022 Jan 17. doi: 10.1111/jocd.14784. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35038371/>

Background: Severe atrophic acne scars (AAS) remain the "Achilles's heel" of AAS treatment. The combination of microfat and subcision treatment is a potential solution for severe AAS. Aims: This study aimed to evaluate the efficacy and safety of combined microfat and subcision treatment for severe (grade 4) AAS. Methods: Data of patients with grade 4 AAS who underwent combined microfat and subcision treatment between September 2016 and December 2020 were reviewed. Post-treatment evaluation was performed at least 3 months postoperatively. The severity of AAS was graded based on Goodman's qualitative classification. The volume of concavities was measured using an Antera 3D camera. Complications were documented. Results: A total of 42 patients received a single treatment session. Excellent response was observed in 5 (11.9%) patients, very good in 13 (31.0%), good in 22 (52.4%), and poor response in 2 (4.7%). The average reduction of the total volume of concavities was 28.0%. The most common minor side effects were mild swelling and bruising. No major complications were observed. Conclusions: Combined microfat and subcision treatment is a safe and effective treatment for severe AAS. The approach will be a significant treatment for severe AAS.

Q-Switched 1064-nm Nd: YAG laser versus fractional carbon dioxide laser for post acne scarring: A split-face comparative study. Sabry HH, Hegazy MS, Ahmed E, Salem RM. *Photodermatol Photoimmunol Photomed*. 2022 Jan 12. doi: 10.1111/phpp.12773. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35020221/>

Objectives: Many treatment modalities are available for post acne scarring. However, the response to the treatment is extremely variable among patients. Aim: The aim of this study was to compare the efficacy and safety of Q-switched Nd: YAG (1064 nm) and fractional CO₂ (10,600 nm) lasers in the treatment of atrophic post acne scars. Methods: This study included 20 patients with atrophic facial post acne scars graded according to Sharquie's score. All subjects received four sessions of laser treatment with a 4-week interval between the sessions. The study was designed as a double-blinded, comparative, split-face study applying Q-switched 1064-nm Nd:YAG laser to the right side of the face and fractional CO₂ laser to the left side. Results: Q-switched 1064-nm Nd: YAG laser achieved significantly higher improvement percentage when compared to fractional CO₂ lasers (33.33% versus 17.37% Sharquie's score reduction, respectively). There was a significant negative correlation between the percentages of improvement and the patients' age on both sides and a significant positive correlation with the baseline Sharquie scores on both sides. Conclusion: Q-Switched 1064-nm Nd: YAG laser could be a promising safe option for the management of atrophic post acne scars.

The comparative in vitro killing activity of tea tree oil versus permethrin on demodex folliculorum of rosacea patients. Yurekli A, Botsali A. *J Cosmet Dermatol*. 2022 Jan 10. doi: 10.1111/jocd.14701. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35001487/>

Background: Demodex mites have been implicated in several cutaneous disorders compelling the research efforts for effective anti-Demodex therapy. Objective: Compare the survival time (ST) of Demodex folliculorum exposed to six different concentrations of tea tree oil (TTO) versus a positive control (permethrin 5%) and a negative control (immersion oil) group. Materials and methods: The wastes of rosacea patients' standardized superficial skin biopsy samples were recruited for the trial. The primary outcome measure of this study was the survival time, defined as the period between the exposure of study agents to the complete cessation of Demodex movements. Results: All

differences between the mean survival times of 2.5% (54.0 ± 6.1), 5% (39.0 ± 3.9), 10% (22.0 ± 2.5), 25% (13.0 ± 2.5), 50% (7.8 ± 0.6), and 100% TTO (3.3 ± 1.3) were significant ($p < 0.05$). The ST of the negative control group was 196.0 ± 23.6 min. The ST of permethrin 5% was 12.5 ± 1.9 that did not show a statistically significant difference from the ST of TTO 25% ($p = 0.628$). Conclusion: The survival times of the six different TTO groups confirmed a dose-related pattern, all of which had survival times shorter than the negative control (immersion oil). TTO 25% had comparable efficacy to the positive control agent (permethrin 5%).

Multidrug-resistant cutibacterium avidum isolated from patients with acne vulgaris and other infections.

Koizumi J, Nakase K, Hayashi N, et al. J Glob Antimicrob Resist. 2022 Jan 8;S2213-7165(22)00002-9. doi: 10.1016/j.jgar.2021.12.021. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35017069/>

Objectives: Cutibacterium avidum, a human skin bacterium, rarely causes infectious diseases. It has been recently shown that C. acnes, another member of the genus Cutibacterium, acts as an opportunistic pathogen in surgical site infections. However, the antimicrobial susceptibility and pathogenicity of C. avidum remain unknown. Here, we investigated the epidemiological features of C. avidum. Results: C. avidum strains were isolated from patients with acne vulgaris (29 strains) and patients with other infections (12 strains). Antimicrobial susceptibility testing showed clarithromycin and clindamycin resistance in 65.9% of the tested strains (27/41). In addition, ciprofloxacin resistance was found in 34.1% of the strains (14/41), and 13 of those strains additionally exhibited resistance to both macrolides and clindamycin. Notably, the macrolides-clindamycin resistance gene erm(X) was found on the chromosomes of 92.6% (25/27) of the clindamycin-resistant strains and may be prevalent owing to transmission among C. avidum strains. Ciprofloxacin-resistant strains developed amino acid substitutions in GyrA owing to the use of antimicrobial agents. Pulsed-field gel electrophoresis (PFGE) analysis revealed that only a few strains exhibited 100% similarity. Additionally, no clustering associated with antimicrobial resistance, biofilm-forming ability, and type of infection was observed. Conclusions: Our study revealed that erm(X) may be frequently disseminated in C. avidum, and multidrug-resistant C. avidum strains may colonize the skin of patients with acne vulgaris and patients with other infections. Therefore, the prevalence of multidrug-resistant C. avidum and the use of antimicrobial agents for the treatment of acne vulgaris and other infections associated with C. avidum should be monitored.

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Single-center, assessor-blind study to evaluate the efficacy and safety of DA-5520 topical gel in patients with acne scars: A pilot study.

Han HS, Park JW, Shin SH, et al. J Cosmet Dermatol. 2022 Jan 4. doi: 10.1111/jocd.14693. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/34982507/>

Background: Unlike various topical treatment options for acne vulgaris, options for acne scars mostly involve invasive interventions. So far, only a few clinical trials have investigated the effects of topical treatment for acne scars. Objectives: We evaluated the safety and efficacy of DA-5520, a recently developed topical gel for the treatment of different types of acne scars. Methods: A 12-week prospective, randomized, active-controlled, evaluator-blind, single-center study involving 36 participants with acne scars was performed. Participants were randomized into four different groups at a 1:1:1:1 ratio: laser resurfacing with DA-5520 application (test 1); laser resurfacing without DA-5520 application (control 1); comedone extraction with DA-5520 application (test 2); and comedone extraction without DA-5520 application (control 2). For 12 weeks, participants in the two test groups applied DA-5520 twice daily, while participants in the control groups applied moisturizers alone. Participants in the test 1 and control 1 groups received a single session of laser resurfacing at visit 1 (week 0). All participants were followed up at 1, 4, 8, and 12 weeks, and objective scar evaluation using the échelle d'évaluation clinique des cicatrices d'acné (ECCA) score was performed at each visit. Results: Clinical improvement of acne scars, confirmed by the ECCA grading scale (1 for atrophic scar

and 2 for hypertrophic scar), was observed after using DA-5520 when combined with laser resurfacing or individually, and no associated adverse reactions were noted. Conclusions: Preliminary results of this study revealed that DA-5520 may be a promising new formulation for treating all type of acne scars.

Comparison of red light and blue light therapies for mild-to-moderate acne vulgaris: A randomized controlled clinical study. Li J, Li J, Zhang L, et al. *Photodermatol Photoimmunol Photomed*. 2022 Jan 3. doi: 10.1111/phpp.12769. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/34981580/>

Background: Red and blue light therapies are safe and effective treatments for mild-to-moderate acne vulgaris. However, very few previous studies have directly compared the characteristics of these two methods. Objective: To compare the efficacy and side effects of red light (RL) and blue light (BL) for acne vulgaris and to assess these two therapies in different types of lesions. Materials and methods: A total of 28 subjects with mild-to-moderate acne vulgaris were randomized into the RL group or the BL group. Subjects in each group received different light treatments, and they were followed up regularly until 2 weeks after the last treatment. The improvement rates of different types of acne lesions were compared between the 2 groups, as well as the incidence of adverse reactions. Results: At the 2-week follow-up, the average improvement rate of total acne lesions was 36.2% in the RL group and 30.7% in the BL group ($p > .05$). The average improvement rate of inflammatory and non-inflammatory lesions was 51.5% and 17.3% in the RL group, compared with 26.4% and 10.0% in the BL group (all $p > .05$). Treatment-related adverse reactions were observed distinctly in the BL group. Conclusions: Red light and BL therapies have similar efficacy in mild-to-moderate acne vulgaris, especially for inflammatory lesions. RL had advantages with fewer adverse reactions compared with BL.

Surfactin-oleogel with therapeutic potential for inflammatory acne vulgaris induced by propionibacterium acnes. Shan M, Meng F, Tang C, et al. *Appl Microbiol Biotechnol*. 2022 Jan;106(2):549-562. doi: 10.1007/s00253-021-11719-8. Epub 2021 Dec 23. <https://pubmed.ncbi.nlm.nih.gov/34939137/>

Accumulating evidence suggested that suppression of *Propionibacterium acnes*-induced inflammation was a promising strategy to alleviate acne vulgaris. This study evaluated the alleviating effect of surfactin-oleogel on *P. acnes*-induced inflammatory acne vulgaris in mice. Epidermis morphology and histopathological examination showed that surfactin-oleogel effectively ameliorated the *P. acnes*-induced epidermis swelling and erythema. Surfactin-oleogel reduced the epidermis thickness to 48.52% compared to the model control group. The colony of *P. acnes* in the epidermis was decreased by 1 log CFU/mL after receiving surfactin-oleogel treatment. Furthermore, surfactin-oleogel attenuated oxidative stress in the epidermis by increasing the activities of superoxide dismutase, catalase, and glutathione peroxidase. In addition, the expression of inducible nitric oxide synthase, nitric oxide, cyclooxygenase-2, pro-inflammatory cytokines (e.g. tumour necrosis factor- α and interleukin-1 β), and nuclear factor kappa-B in the epidermis were reduced after treating with surfactin-oleogel. Moreover, total cholesterol and free fatty acids were decreased, whereas the treatment of surfactin-oleogel increased triglycerides and linoleic acid content. Besides, immunohistochemical assay and real-time PCR analysis indicated that surfactin-oleogel blocked the TLR2-mediated NF- κ B signalling pathways in the epidermis. Consequently, our results demonstrated that surfactin-oleogel had antibacterial and anti-inflammation activities to treat *P. acnes*-induced inflammatory acne vulgaris. Key points • Surfactin-oleogel effectively relieves inflammation and oxidative stress caused by *P. acnes*. • Surfactin-oleogel effectively reduced the *P. acnes* colony. • Surfactin-oleogel relieves *P. acnes*-induced inflammation by inactivated the TLR-mediated NF- κ B.

Evaluation of psychological well-being and social impact of atrophic acne scarring: A multinational, mixed-methods study. Tan J, Beissert S, Cook-Bolden F, et al. *JAAD Int.* 2021 Dec 23;6:43-50. doi: 10.1016/j.jdin.2021.11.006. eCollection 2022 Mar. <https://pubmed.ncbi.nlm.nih.gov/35005652/>

Background: Most people with acne are at risk of developing acne scars, but the impact of these scars on patients' quality of life is poorly researched. Objective: To assess the perspective of patients with acne scars and the impact of these scars on their emotional well-being and social functioning. Methods: A 60-minute interview of 30 adults with acne scars informed and contextualized the development of a cross-sectional survey of 723 adults with atrophic acne scars. Results: The main themes identified in the qualitative interviews included acceptability to self and others, social functioning, and emotional well-being. In the cross-sectional survey, 31.6%, 49.6%, and 18.8% of the participants had mild, moderate, and severe/very severe acne scarring. The survey revealed that 25.7% of the participants felt less attractive, 27.5% were embarrassed or self-conscious because of their scars, 8.3% reported being verbally and/or physically abused because of their scars on a regular basis, and 15.9% felt that they were unfairly dismissed from work. In addition, 37.5% of the participants believed that their scars affected people's perceptions about them, and 19.7% of the participants were very bothered about hiding their scars daily. Moreover, 35.5% of the participants avoided public appearances, and 43.2% felt that their scars had negatively impacted their relationships. Limitations: The temporal evaluation of the impact was not estimated. Conclusion: Even mild atrophic acne scarring can evoke substantial emotional, social, and functional concerns.

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Clinical Reviews

Treating acne in transgender persons receiving testosterone: A practical guide. Radi R, Gold S, Acosta JP, et al. *Am J Clin Dermatol.* 2022 Jan 11;1-11. doi: 10.1007/s40257-021-00665-w. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35018581/>

Transgender persons who undergo masculinizing hormone therapy experience a wide array of dermatologic effects as they initiate and maintain testosterone therapy. Acne is one of the most common adverse effects for many transmasculine patients receiving testosterone. Acne can worsen body image and mental health, with significant impact on quality of life in transgender patients. Specific training and awareness are needed for a clinically and culturally competent encounter while providing care for the transgender patient. This article provides a practical guide for the treatment of testosterone-induced acne in transmasculine patients. Recommendations on creating a welcoming clinical setting, taking a gender-inclusive history, and conducting a patient-centered physical examination relevant to acne care are provided. Assessment of reproductive potential and the appropriate contraceptive methods before prescribing acne treatment with teratogenic potential in transmasculine patients are examined. Interactions between acne treatments with gender-affirming therapies are explored. For patients with severe or treatment-refractory acne, indications, contraindications, and barriers to isotretinoin prescription, such as the US iPLEDGE program, are examined. Multidisciplinary approaches to acne care, involving mental health, reproductive health, gender-affirming hormone therapy and surgeries, are adopted to guide isotretinoin treatment.

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Low dose oral isotretinoin for the treatment of adult patients with mild-to-moderate acne vulgaris: Systematic review and meta-analysis. Al Muqarrab F, Almohssen A. *Dermatol Ther.* 2022 Jan 9;e15311. doi: 10.1111/dth.15311. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/35000295/>

Acne vulgaris is one of the most common dermatologic complaints. Recently, isotretinoin has been used as an off-label indication for the treatment of mild-to-moderate grades of acne not responding to conventional treatment. Its

conventional recommended dose is 0.5-1.0 mg/kg per day to the cumulative dose of 120-150 mg/kg. Objectives: To qualify the state of evidence and analyze the efficacy of the low daily dose and the pulsed doses of isotretinoin in treating mild-to-moderate acne patients with regards to response and relapse rates. Method: Systematic review and meta-analysis using an electronic literature search were performed. 320 potentially relevant articles were included and reviewed. Results: The level of evidence is moderate to low as conducted by the GRADE quality of evidence assessment. The pooled statistical estimate for response to treatment in the group comparing low daily doses with conventional dose showed an overall benefit for conventional dose. On the other hand, pooled data from the group comparing the low daily dose with the pulsed doses yielded an overall beneficial effect from using the low daily dose compared with the pulsed doses on achieving the response. Conclusions: Given all of the available studies, the quality of evidence is low. It appears that conventional dose isotretinoin improves the odds of prolonged remission in adults with mild-to-moderate acne vulgaris compared to the low doses.

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Dapsone in hidradenitis suppurativa: A systematic review. Rabindranathnambi A, Jeevankumar B. *Dermatol Ther (Heidelb)*. 2022 Jan 8. doi: 10.1007/s13555-021-00674-x. Online ahead of print.

<https://pubmed.ncbi.nlm.nih.gov/34997914/>

Introduction: Hidradenitis suppurativa (HS) is a chronic, inflammatory, recurrent disease, usually presenting after puberty with inflammatory lesions that mainly affect the apocrine gland-bearing areas of the body, most commonly the axillary, inguinal and anogenital regions. The treatment of HS is associated with certain challenges due to intrinsic resistance to various treatments and the presence of comorbidities and complications. The antibiotic dapsone is an established treatment for HS, but the current evidence base is limited. The aim of this review is to systematically review the literature on the efficacy of dapsone in the treatment of HS. Methods: The Cochrane, PubMed and CINAHL databases were searched for relevant articles to be included in the systematic review. Results: A total of seven studies, with a cumulative patient population of 135 patients, were included. Of these 135 patients, 62.2% demonstrated various degrees of improvement following treatment. However, as only three of the seven studies used dapsone monotherapy it is difficult to assess the effectiveness of dapsone because the benefits observed may be due to concurrently administered treatment. Conclusion: Overall, the quality of evidence supporting the use of dapsone is weak. However, it is a well established treatment recommended in current, various national guidelines. There is a crucial need for well-designed randomized controlled trials to support its usage.

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Treatment protocols and efficacy of light and laser treatments in post-acne erythema. Amiri R, Khalili M, Mohammadi S, et al. *J Cosmet Dermatol*. 2022 Jan 5. doi: 10.1111/jocd.14729. Online ahead of print.

<https://pubmed.ncbi.nlm.nih.gov/34985175/>

Background: Post-acne erythema is described as erythema due to release of inflammatory cytokines, dilatation of microcapillaries within papillary dermis and thinning of epidermis. The erythema usually fades; however, it can persist for months. Aim: In this review, we decided to evaluate efficacy of light and laser treatments in acne-induced erythema. Methods: We searched PUBMED, Embase, Cochrane, and Google Scholar for relevant key words. Inclusion criteria were randomized clinical trials (RCTs) that evaluated efficacy of laser or light in PAE until September 2021. Results: Twelve RCTs were selected for the final assessment. Light and laser treatments included pulsed dye laser (PDL), intense pulsed light (IPL), Q-switched neodymium-doped yttrium aluminum garnet (QS Nd:YAG), fractional photothermolysis, alexandrite, solid-slate 589-1319 nm, and pro-yellow laser. Conclusion: Light and laser treatments are effective treatment modalities in reduction of acne-induced erythema along with active acne lesions and atrophic acne scars.

The therapeutic effects in patients with rosacea: How do we evaluate them? Zhao S, Wang M, Zhou Y, Yan Y. *J Cosmet Dermatol.* 2022 Jan 4. doi: 10.1111/jocd.14713. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/34982849/>

Background: Rosacea is a common, chronic skin disorder with negative impacts on physical health and social function. The response to therapy plays a critical factor in determining the duration of treatment and developing new medicines. However, it is challenging to assess the efficacy due to its complicated clinical characteristics and nonspecific histopathological findings. Aims: This study aims to review the efficacy evaluation tools for rosacea. Methods: An extensive literature search was conducted using PubMed, Web of Science, and other databases for articles on efficacy evaluation methods for rosacea from 1995 to 2021. Results: In clinical practice and scientific research, various methods are available for assessing the curative effect. Evaluation tools based on phenotypes are the most commonly used because they are cheap and straightforward. Various questionnaires also exist to evaluate health-related quality of life. However, the inevitable subjectivity makes it challenging to compare the curative effect among different studies. By contrast, objective assessment tools are more precise and repeatable, such as consecutive standardized skin surface biopsies, computer-aided image analysis, and biophysical parameter assessments. Conclusion: No single assessment method could balance convenience and accuracy. For improving outcomes and facilitating academic exchanges, a well-validated gold standard evaluation tool is still needed. This review provides an overview of the existing efficacy evaluation methods for rosacea and discusses the relevant details.

Evaluating the effectiveness and safety of radiofrequency for face and neck rejuvenation: A systematic review. Austin GK, Struble SL, Quatela VC. *Lasers Surg Med.* 2022 Jan;54(1):27-45. doi: 10.1002/lsm.23506. Epub 2021 Dec 19. <https://pubmed.ncbi.nlm.nih.gov/34923652/>

Background: Radiofrequency technology has emerged as a treatment for aesthetic rejuvenation. Objective: To examine radiofrequency for facial and neck rejuvenation, clinical studies were assessed on effectiveness and safety of radiofrequency for acne, acne scars, and facial aging by subjective and objective measures. Methods: A systematic literature review was performed. Eligibility criteria included articles in English, primary literature, clinical or ex vivo studies, use of radiofrequency, and face or neck treatment. Ablative techniques, home-use devices, combined modalities, and studies unrelated to rejuvenation were excluded. All studies were appraised for quality and biases. Results: We identified 121 articles. Radiofrequency effectively treated acne by reducing sebum levels and lesion count and improving acne scars. Radiofrequency demonstrated a volumetric reduction in facial fat, and improved skin laxity, elasticity, and global skin aesthetic. Patient satisfaction was higher for those desiring modest rejuvenation. There were histological changes consistent with repair response, neocollagenesis, and neoelastinogenesis. Radiofrequency was safe apart from one patient who developed a neck fistula. Conclusion: Most studies demonstrated radiofrequency treatment of acne, scars, or facial rhytids had positive subjective improvement ratings. Objective studies demonstrated reduction of acne, decreased scarring, lifting effect, improvement in elasticity and collagen, volumetric fat changes, and wrinkle reduction.

The role of biofilm formation in the pathogenesis and antimicrobial susceptibility of cutibacterium acnes. Coenye T, Spittaels KJ, Achermann Y. *Biofilm.* 2021 Dec 9;4:100063. doi: 10.1016/j.bioflm.2021.100063. eCollection 2022 Dec. <https://pubmed.ncbi.nlm.nih.gov/34950868/>

Cutibacterium acnes (previously known as Propionibacterium acnes) is frequently found on lipid-rich parts of the human skin. While C. acnes is most known for its role in the development and progression of the skin disease acne, it is also involved in many other types of infections, often involving implanted medical devices. C. acnes readily forms biofilms in vitro and there is growing evidence that biofilm formation by this Gram-positive, facultative anaerobic micro-

organism plays an important role in vivo and is also involved in treatment failure. In this brief review we present an overview on what is known about *C. acnes* biofilms (including their role in pathogenesis and reduced susceptibility to antibiotics), discuss model systems that can be used to study these biofilms in vitro and in vivo and give an overview of interspecies interactions occurring in polymicrobial communities containing *C. acnes*.

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