Publications Template

#	Research Title	Field	Abstract	Year of Publication Publishing	Publishing Link "URL"
1	Nano-cubosomes of the phyto-active principle in Withania somnifera: LC-MS-NMR, anti-microbial, and insights of the anti-neuropathic and anti-inflammatory mechanism	Microbiology	Withania somnifera (W. somnifera) has a long history of safety in the amelioration of neuro-active ailments. The current study aims to explore Withania somnifera phyto-active principle anti-microbial, ant-neuropathic, and anti-inflammatory activities, and to modify these activities utilizing nano-cubosomes exploiting their mechanisms of action. Bio-guided fractionation technique was utilized, to identify the most phyto-active compound, using LC-MS-NMR online technique and biological models of diabetes, neuropathy, and	**2024**	https://www.sciencedirect.com/science/article/pii/S0367326X24003794

			inflammation. In-vitro antibacterial activity was also monitored. The HbA1c, in-vivo antioxidant (serum-catalase, TBARS, and GSH), serum insulin, and pro-inflammatory serum cytokines (TNF alpha, IL-six, and IL-ten) levels have been assessed to establish the anti-neuropathic and anti-inflammatory mechanisms. The nano-cubosomal formulations (CUB 1–3) were utilized to improve the W. somnifera		
2	Antibacterial and antibiofilm activities of diclofenac against levofloxacin-resistant Stenotrophomonas maltophilia isolates; emphasizing repurposing of diclofenac	Microbiology	Materials and Methods: Minimum inhibitory concentration was determined using broth microdilution method for levofloxacin, diclofenac, and levofloxacin/diclofenac combination. Biofilm forming capacity and biofilm inhibition assay were determined.	**2024**	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11162161/

			Relative gene expression was measured for efflux pump genes; smeB, and smeF genes and biofilm related genes rmlA, spgM, and rpfF without and with diclofenac and the combination. Results: Diclofenac demonstrated MIC of 1 mg/ml. The combination-with ½ MIC diclofenac-showed synergism where levofloxacin MIC undergone 16–32 fold decrease. All the isolates that overexpressed smeB and smeF showed a significant decrease in gene expression in presence of diclofenac or the combination. The mean percentage inhibition of biofilm formation with diclofenac and the combination was 40.59% and 46.49%, respectively. This agreed		

			with biofilm related genes		
3	Evaluation of Azithromycin and Fenugreek Oil as Anti-virulence Agents against Stenotrophomonas maltophilia MultiDrug Resistant Clinical Isolates	Microbiology	Stenotrophomonas maltophilia is a gram-negative opportunistic pathogenic bacterium that is associated with hospital- and community-acquired infections. Ithas a set of virulence factors, such as biofilm formation and extracellular enzymes, that are mostly regulated via quorum sensing (QS) systems. Azithromycin (AZM) is a macrolide that is well known for its anti-virulence effects, including anti-QS and antibiofilm effects. Additionally, some spice essential oils have been reported to inhibit bacterial virulence. This study evaluated the effect of AZM and Fenugreek Oil (FO), a spice essential oil from Fenugreek seeds, against	**2024**	https://ejbo.journals.ekb.eg/article_325699.html

			some virulence factors of multidrug-resistant Stenotrophomonas maltophilia clinical isolates. Both AZM and FO showed significant inhibitory effects against protease activity, where all tested isolates showed 100% loss of the halo zone formed in skimmed milk agar test with AZM and a 25 to 35% reduction in the zone with FO. A mean reduction in the interstitial surface area of 34.4% and 35.5% was detected with AZM and FO, respectively, in the twitching motility assay. While AZM showed a significant effect in reducing biofilm formation by S. maltophilia isolates (mean inhibition of 49.7%), the reducing effect of FO (18.5%) was not significant. Genotypically, exposure		

			of S. maltophilia clinical isolates to AZM and FO significantly reduced the expression of protease-encoding genes (stmPr1, stmPr2 and StmPr3) and a quorum sensing gene (rpfC).		
4	Potential antiviral activity of metformin against human Adenovirus-7	Microbiology	Background Human adenovirus 7(HAdV-7) cause acute respiratory tract infections with high morbidity and mortality rates in children and immunocompromised adults. Metformin is a natural oral antihyperglycemic drug, that possesses antiviral activity. Our study aimed to investigate and compare the antiviral activity and mechanism of action of metformin and ribavirin against HAdV-7. Methods The antiviral activity and cytotoxicity of each of metformin and ribavirin	**2024**	https://journals.ekb.eg/article_339378.html

			per se and in combination were tested using the crystal violet method. The mechanism of action of metformin against HAdV-7 was assessed during viral adsorption and replication phases. The viricidal effect and cytopathic effect inhibition of metformin was also determined. Results Metformin revealed a moderate antiviral activity against HAdV-7 with a selective index = estimated CC50/estimated IC50 = 5.0 in comparison with selective index of ribavirin 1.82. Metformin demonstrated modest antiviral activity against HAdV-7 with a selective index = estimated CC50/estimated IC50 = 5.62 during the replication process, but		

			not during the other phases of infection. The combined effect of both drugs revealed a low antiviral activity against HAdV-7 in comparison to using each drug alone; Antiviral index = 2.87, SI = 5.0. Conclusion Metformin has a potential promising antiviral activity against HAdV-7.		
5	Evaluation of Wound Healing Parameters and Antibacterial Effect of Jojoba and Citrullus colocynthis Oils in Staphylococcus Wound Infection Induced in Mice	Microbiology	Staphylococcus aureus is responsible for most bacterial wound infections. Antibiotics are the first-line treatment; however, their indiscriminate use led to the emergence of resistance. Alternative therapeutic options beyond antibiotic treatment are required. Our study aimed to evaluate and compare the healing parameters and antibacterial activity of Jojoba and Citrullus	**2023**	https://pdfs.semanticscholar.org/1c2d/0ec5f768f925079dd16858e7a096a1e04e5e.pdf

			colocynthis oil extracts in the treatment of Staphylococcus aureuswound infections. In-vivo assessment of inflammatory biomarkers, matrix metalloproteinase and histopathological examination of Staphylococcus aureus induced wound lesions were conducted in mice. Levels of interleukin 1 and interleukin 6 were reduced, while matrix metalloproteinases ratio; MMP-1/MMP-9 was increased after topical application of both essential oils. Citrullus colocynthis oil showed optimum wound healing compared to the other treated groups in histopathological examination. In conclusion, topical Citrullus colocynthis preparation may be a		

			promising alternative natural dermatological application with enhanced antibacterial activity.		
6	Interspecies Interaction between Pseudomonas aeruginosa, Staphylococcus aureus and E. coli in vitro.	Microbiology	Microbial interactions are frequently categorized according to how they affect each population in a binary system. We aimed to determine the interaction between P . aeruginosa, S . aureus, and E . coli in-vitro. In this experimental hospitalized patients' sputum, urine, and blood samples were used to collect a total of 90 clinical isolates for the study in Damanhour Medical National Institute, Behira, Egypt, followed by accurate identification and testing for antibiotic sensitivity. To examine the effect of the supernatant of P. aeruginosa on S. aureus and E. coli determined MIC using broth microdilution method. We also measured the activity of lasA protease by assessing the S. aureus cell lysis potential of P. aeruginosa culture supernatants. Extraction of pyocyanin was made to determine the change in the cell nature of S. aureus upon exposure to pyocyanin by	2023	https://d1wqtxts1xzle7.cloudfront.net/105180256/62665-libre.pdf?1692636739=&response-content-disposition=inline%3B+filename%3DInterspecies_Interaction_between_Pseudom.pdf&Expires=1725965680&Signature=MAD0AZl1d2Cg~SA9YKg5XhEuOlEeTAP1OAMzguOeA1UAc9s2Y-GBvdNJSo5HGiiPLiFMHVEpN0eiSrZRKgzj3~K2ZsdJpvfPNDv-iG1Fd~HAZwFy~Eq865RX7Jd36WBqsEAbSXZevhdMBk50qAGgIsdPMKKjYcY0D20qV4nI7TbNrm9pZP~saQvDCeB5j8D95JwFQn8gTcuv7ZQEwl1NwfnwKs9lgty54liuoWW0JZDN0Cv9LYuyqlyVkEnHJJOdXQkb7VD7482PShPL~M-lUIcHA2b-KAmWFu08zjMu4hbw7yDxMoQG2autVzwqdMw93H~rghr-ZH7BM4yaq7hFw__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA

			using a scanning electron microscope and the shape of colonies on the culture media was determined. Finally, we detect lasA, operon phz, phzM, phzS and rhlAB genes for P. aeruginosa. P. aeruginosa showed a great impact on S. aureus isolates resistant to different antibiotics as it facilitates their killing and may drive the normal colonies of S. aureus into SCVs. The ability to form biofilm by S. aureus and E. coli decreased in the presence of Pseudomonas supernatant.		
7	Rational design of biodegradable sulphonamide candidates treating septicaemia by synergistic dual inhibition of COX-2/PGE2 axis and DHPS enzyme	Microbiology	A new series of co-drugs was designed based on hybridising the dihydropteroate synthase (DHPS) inhibitor sulphonamide scaffold with the COX-2 inhibitor salicylamide pharmacophore through biodegradable linkage to achieve compounds with synergistic dual inhibition of COX-2/PGE2 axis and DHPS enzyme to enhance antibacterial activity for treatment of	**2022**	https://www.tandfonline.com/doi/full/10.1080/14756366.2022.2086868

			septicaemia. Compounds **5 b, 5j, 5n** and **5o** demonstrated potent *in vitro* COX-2 inhibitory activity comparable to celecoxib. **5j** and **5o** exhibited ED_{50} lower than celecoxib in carrageenan-induced paw edoema test with % PGE2 inhibition higher than celecoxib. Furthermore, **5 b**, **5j** and **5n** showed gastric safety profile like celecoxib. Moreover, *in vivo* antibacterial screening revealed that, **5j** showed activity against *S.aureus and E.coli* higher than sulfasalazine. While, **5o** revealed activity against *E.coli* higher than sulfasalazine and against *S.aureus* comparable to sulfasalazine. Compound **5j** achieved the target goal as potent inhibitor of COX-2/PGE2 axis and *in vivo* broad-spectrum antibacterial activity		

			against induced septicaemia in mice.		
8	Diabetic Foot Ulcer Infections and *Pseudomonas aeruginosa* Biofilm Production During the COVID-19 Pandemic.	Microbiology	During the different waves of the coronavirus (COVID-19) pandemic, there has been an increased incidence of diabetes mellitus and diabetic foot infections. Among gram-negative bacteria, Pseudomonas aeruginosa is the predominant causative agent for diabetic foot ulcer infections in low-resource countries. P. aeruginosa possesses a variety of virulence factors, including biofilm formation. Biofilm formation is an important benchmark characteristic in the pathophysiology of diabetic foot ulceration. The main objective of the current study was to identify the most commonly isolated organisms and their antibiotic susceptibility	**2022**	https://microbiologyjournal.org/diabetic-foot-ulcer-infections-and-pseudomonas-aeruginosa-biofilm-production-during-the-covid-19-pandemic/

			patterns in diabetic foot patients during the COVID-19 pandemic. We also determined the genes associated with bacterial persistence and biofilm formation in the predominantly isolated organism. Accordingly, 100 wound swab samples were collected from diabetic foot patients from different hospitals in Alexandria, Egypt. Through phenotypic detection of biofilm formation, 93% (40) of the 43 P. aeruginosa isolates examined were categorized as biofilm producers. Molecular detection of the biofilm-encoding genes among the 43 P. aeruginosa isolates was as follows: algD (100%), pelF (88%) and pslD (49.7%), and this highlights a need for biofilm formation inhibitors to prevent the		

			persistence of bacterial pathogens, and thus achieve better clinical outcomes in diabetic foot ulcer infections. Keyword: Diabetic foot ulcer infections, Pseudomonas aeruginosa, biofilm, COVID-19		
9	Anti-spike and neutralizing antibodies after two doses of COVID-19 sinopharm/BIBP vaccine	Microbiology	Host response to COVID-19 vaccines is partially evaluated through the estimation of antibody response, specifically the binding anti-spike (anti-S) and the neutralizing antibodies (nAbs) against SARS-CoV-2. Vaccine-induced humoral response affects decisions on the choice of vaccine type, vaccine acceptance, and the need for boosting. Identification of risk factors for poor antibody response helps to stratify individuals who might potentially require booster doses.	**2022**	https://www.mdpi.com/2076-393X/10/8/1340

			The primary objective of this cross-sectional study was to investigate the antibody response after receiving two Sinopharm vaccine doses. Factors affecting antibody response were additionally studied. Moreover, a predictive cutoff for anti-S was generated to predict positivity of nAbs. Blood samples were collected from 92 adults and relevant data were recorded. Antibody levels (anti-S and nAbs) against SARS-CoV-2 were tested one month following the second dose of Sinopharm vaccine using two commercial ELISA tests. Among the 92 participants, 88 tested positive for anti-S (95.7%), with a median level of 52.15 RU/mL (equivalent to 166.88 BAU/mL). Fewer		

			participants (67.4%) were positive for nAbs, with a median percentage of inhibition (%IH) of 50.62% (24.05–84.36). A significant positive correlation existed between the titers of both antibodies (correlation coefficient = 0.875, $p < 0.001$). When the anti-S titer was greater than 40 RU/mL (128 BAU/mL), nAbs were also positive with a sensitivity of 80.6% and a specificity of 90%. Positive nAbs results were associated with a higher anti-S titers (62.1 RU/mL) compared to negative nAbs (mean anti-S titer of 18.6 RU/mL). History of COVID		
10	Septic Arthritis: Microbiological Etiology and Molecular Detection of the Most Resistant	Microbiology	***Background:*** *Septic arthritis is a serious emergency causing remarkable morbidity and mortality worldwide. Expeditious*	**2021**	https://journals.ekb.eg/article_202517.html

	Etiological Agents.		*diagnosis and effective treatment are necessary to achieve better clinical outcomes and avoid devastating joint consequences.* ***Objective:*** *we focused to detect the most common etiological agent and associated resistance to commonly used antibiotics in Nariman Hospital in Alexandria, Egypt. Molecular detection of mecA gene which causes resistance in methicillin-resistant Staphylococcus aureus and results in treatment failure was studied among our isolates.* ***Methodology:*** *One hundred and fifty joint fluid aspirates were included in the study. Identification of the isolates was done by conventional microbiological methods and BACTEC MGIT 960 TM system. Antibiotic*		

			susceptibility tests were done to detect resistance in our isolates. Molecular amplification of mecA gene was done in isolated methicillin-resistant Staphylococcus aureus (MRSA). ***Results:*** *It was noted that most the of specimens were collected from males. Culture results showed monomicrobial bacterial growth in 90.2% of samples tested. Staphylococcus aureus was the major organism isolated. 88.9% of methicillin-resistant Staphylococcus aureus (MRSA) were positive for mecA gene.* ***Conclusion:*** *As far as we know, this is the first research in Alexandria investigating the most common etiological agent and associated resistance resulting in treatment failure in the leading*		

			orthopedic hospital in Alexandria.		
11	Nanophyto-gel against multi-drug resistant *Pseudomonas aeruginosa* burn wound infection.	Microbiology	Burn wound is usually associated by antibiotic-resistant *Pseudomonas aeruginosa* infection that worsens and complicates its management. An effective approach is to use natural antibiotics such as cinnamon oil as a powerful alternative. This study aims to investigate topical nanostructured lipid carrier (NLC) gel loaded cinnamon oil for *Pseudomonas aeruginosa* wound infection. A 2^4 full factorial design was performed to optimize the formulation with particle size 108.48 ± 6.35 nm, zeta potential −37.36 ± 4.01 mV, and EE% 95.39 ± 0.82%. FTIR analysis revealed no excipient interaction.	**2021**	https://www.tandfonline.com/doi/full/10.1080/10717544.2021.1889720

			Poloxamer 407 in a concentration 20% w/w NLC gel was prepared for topical application. Drug release exhibited an initial burst release in the first five hours, followed by a slow, sustained release of up to five days. NLC-cinnamon gel has a significant ability to control the drug release with the lowest minimum inhibitory concentration again *P. aeruginosa* compared to other formulations ($p < .05$). *In vivo* study also showed NLC-cinnamon gel effectively healed the infected burned wound after a six-day treatment course with better antibacterial efficacy in burned animal models. Histological examination ensured the tolerability of NLC-cinnamon gel. The results suggest that		

			nanoparticle-based cinnamon oil gel is a promising natural product against antibiotic-resistant strains of *P. aeruginosa* in wound infection.		
12	A Nanoparticles based Microbiological Study on the Effect of Rosemary and Ginger Essential Oils against *Klebsiella pneumoniae*.	Microbiology	**Background:** *Klebsiella pneumoniae* is a nosocomial pathogen in outbreaks of hospital infections. It is one of the major factors for morbidity and mortality in hospitalized patients especially those infected with colistin-resistant pathogens. Many plant essential oils have antimicrobial activities and have been investigated as natural sources to combat multiple antibiotic resistances. Moreover, recent advances in phytonanotechnology have created exciting opportunities for the management of many infections. **Objective:** This study aims at investigating the antimicrobial and antibiofilm effect of	**2020**	https://benthamopen.com/ABSTRACT/TOMICROJ-14-205

			rosemary and ginger essential oil-based nano-sized formulations on colistin resistant *K. pneumonia* clinical isolates. **Methods:** Isolation and identification of 30 *K. pneumonia* isolates from different human samples were done followed by antibiotic susceptibility testing and detection of biofilm gene (*mrkD*). Examination of the activity of the tested essential oils and their chitosan nanoparticle formulations against the selected isolates was made by determination of their MICs using broth microdilution method followed by biofilm inhibition test and quantitative real-time PCR for the expression of *mrkD* gene in the presence of the oils and nanoparticles formulations compared to untreated bacterial isolates. **Results:** Our results showed that the minimum inhibitory concentration of rosemary and ginger oils was 1250 µg/ml, that of		

			nanostructured lipid carrier-rosemary oil and nanostructured lipid carrier-ginger oil was 625 µg/ml and rosemary oil loaded chitosan nanoparticles and ginger oil loaded chitosan nanoparticles possessed minimum inhibitory concentration of 156 µg/ml. Results also revealed complete (100%) inhibition for *mrkD* gene expression when compared to untreated *K. pneumonia*. **Conclusion:** Oil loaded chitosan nanoparticles showed the highest antimicrobial and antibiofilm activity.		
13	Synthesis and molecular docking study of some 3, 4-dihydrothieno [2, 3-d] pyrimidine derivatives as potential antimicrobial agents	Microbiology	In continuation of our research program aiming at developing new potent antimicrobial agents, new series of substituted 3,4-dihydrothieno[2,3-d]pyrimidines was synthesized. The newly synthesized compounds were preliminary tested for their in vitro activity against six bacterial and three fungal strains using the agar diffusion	**2019**	https://www.sciencedirect.com/science/article/abs/pii/S0045206819300276

			technique. The results revealed that compounds 7, 8a, 10b, 10d and 11b exhibited half the potency of levofloxacine against the Gram-negative bacterium, *Pseudomonas aeruginosa*, while compounds 5a, 8b, 10c and 12 displayed half the potency of levofloxacine against *Proteus Vulgaris*. Whereas, compounds 7, 10b, 10d and 11b showed half the activity of ampicillin against the Gram-positive bacterium, *B. subtilis*. Most of the compounds showed high antifungal potency. Compounds 3, 6, 7, 9b, 10a, 11a, 11b, 15 and 16 exhibited double the potency of clotrimazole against *A. fumigatus*. While compounds 3, 4, 5a, 5b, 9b, 10a, 10b, 10c, 13, 15, 16 and 18 displayed double the activity of clotrimazole against *R. oryazae*. Molecular docking studies of the active compounds with the active site of the *B. anthracis* DHPS, showed good scoring for various interactions with the active site of the enzyme		

			compared to the co-crystallized ligand.		
14	Synthesis, antibacterial evaluation, and DNA gyrase inhibition profile of some new quinoline hybrids	Microbiology	Antibiotic-resistant bacteria continue to play an important role in human health and disease. Inventive strategies are necessary to develop new therapeutic leads to challenge drug-resistance problems. From this perception, new quinoline hybrids bearing bioactive pharmacophores were synthesized. The newly synthesized compounds were evaluated for their in vitro antibacterial activity against nine bacterial pathogenic strains. The results revealed that most compounds exhibited good antibacterial activities. Seven compounds (**2b**, **3b**, **4**, **6**, **8b**, and **9c,d**) displayed enhanced activity against methicillin-resistant *Staphylococcus aureus* compared to ampicillin. These compounds were subjected to an in vitro *S. aureus* DNA gyrase ATPase inhibition study, which revealed that compounds **8b**, **9c**, and **9d**	**2019**	https://onlinelibrary.wiley.com/doi/abs/10.1002/ardp.201900086

			showed the highest inhibitory activity with IC_{50} values of 1.89, 2.73, and 2.14 μM, respectively, comparable to novobiocin (IC_{50}, 1.636 μM). Compounds **2a–c**, **3a**, **7c**, **9c,d**, and **10a,b** revealed half the potency of levofloxacin in inhibiting the growth of *Pseudomonas aeruginosa*. As an attempt to rationalize the observed antibacterial activity for the most active compounds **8b**, **9c**, and **9d**, molecular docking in the ATP binding site of *S. aureus* gyrase B was performed using Glide. Such compounds could be considered as promising scaffolds for the development of new potent antibacterial agents.		
15	Design, synthesis, antibacterial evaluation and molecular docking studies of some new quinoxaline derivatives targeting dihyropteroate synthase enzyme	Microbiology	Development of new antimicrobial agents is a good solution to overcome drug-resistance problems. From this perspective, new quinoxaline derivatives bearing various bioactive heterocyclic moieties (thiadiazoles, oxadiazoles, pyrazoles and thiazoles) were designed and synthesized. The newly	**2018**	https://www.sciencedirect.com/science/article/abs/pii/S0045206817307423

			synthesized compounds were evaluated for their *in vitro* antibacterial activity against nine bacterial human pathogenic strains using the disc diffusion assay. In general, most of the synthesized compounds exhibited good antibacterial activities. The thiazolyl 11c displayed significant antibacterial activities against *P. aeruginosa* (MIC, 12.5 µg/mL vs levofloxacin 12.5 µg/mL). Molecular docking studies indicated that the synthesized compounds could occupy both *p*-amino benzoic acid (PABA) and pterin binding pockets of the dihydropteroate synthase (DHPS), suggesting that the target compounds could act by the inhibition of bacterial DHPS enzyme. The results provide important information for the future design of more potent antibacterial agents.		
16	Synthesis of pyrazolo-1,2,4-triazolo[4,3-a]quinoxalines as	Microbiology	**Aim:** The development of a new class of antimicrobial agents is the optimal lifeline to scrap the	**2018**	https://www.future-science.com/doi/full/10.4155/fmc-2018-0082

	antimicrobial agents with potential inhibition of DHPS enzyme		escalating jeopardy of drug resistance. **Experimental:** This study aims to design and synthesize a series of pyrazolo-1,2,4-triazolo[4,3-*a*]quinoxalines, to develop agents having antimicrobial activity through potential inhibition of dihyropteroate synthase enzyme. The target compounds have been evaluated for their *in-vitro* antimicrobial activity. **Results & discussion:** Compounds **5b, 5c** were equipotent (minimal inhibitory concentration = 12.5 µg/ml) to ampicillin. The docking patterns of **5b** and **5c** demonstrated that both fit into *Bacillus Anthracis* dihydropteroate synthase pterin and *p*-amino benzoic acid-binding pockets. Moreover, their physicochemical properties and pharmacokinetic profiles recommend that they can be considered drug-like candidates. The results highlight some significant information for the future design of lead compounds as antimicrobial agents.		

17	Efficacy of the Clove Oil, Cinnamon Oil, Thyme Oil and Origanum Oil against Multidrug Resistant *Pseudomonas aeruginosa* and *Burkholderia cepacia Complex*	Microbiology	The increased frequency in clinically observed cases of antibiotic resistance has been attributed to many factors such as the misuse and overuse of antibiotics since in some countries, antibiotics are sold over the counter without a prescription, the large quantities of antibiotic waste produced from livestock rearing, overconfidence in human control over infectious diseases and the continued decline in the number of newly approved antibiotics. Few studies have focused on the investigation of antimicrobial activities of medicinal plants against clinically isolated antibiotic resistant pathogens. Hence the aim of this work is to investigate the antimicrobial effect of clove, cinnamon, thyme and origanum on clinically isolated multidrug resistant strains of *Pseudomonas aeruginosa* and *Burkholderia cepacia complex*.	**2017**	https://www.ijcmas.com/abstractview.php?ID=1270&vol=6-1-2017&SNo=4