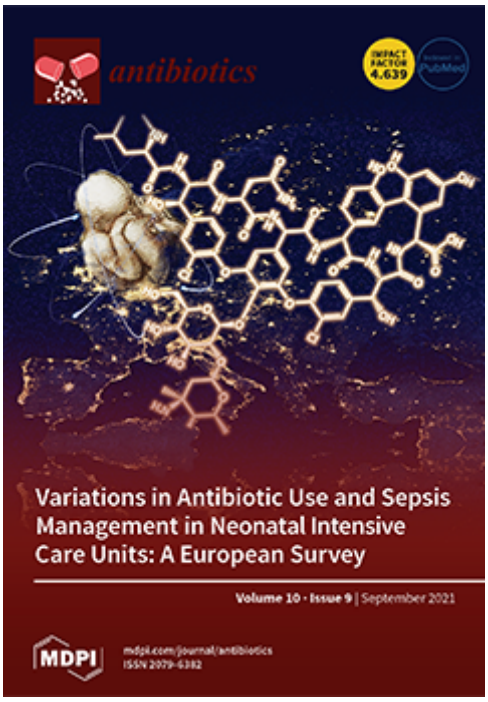
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2. Centre National de la Recherche Scientifique, TIMC, Université Grenoble Alpes, Grenoble, France
Interests: zoonoses; tularemia; brucellosis; bartonellosis; diagnosis; antibiotic susceptibility testing; antibiotic resistance
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★(https://clarivate.com/highly-cited-researchers/2022) Website (https://case.edu/medicine/pqhs/education/clinical-research/clinical-research-faculty/robert-bonomo)
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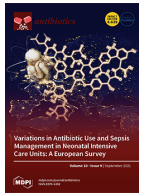
Antibiotics, Volume 10, Issue 9 (September 2021) – 116 articles



Cover Story (**view full-size image (/files/uploaded/covers/antibiotics/big_cover-antibiotics-v10-i9.png)**): The neonatal period is a vulnerable time in life. In some neonatal intensive care units, more than 70% of neonates have been prescribed antibiotics. Early use of antibiotics can have undesirable consequences in the clinical course of these babies, such as antibiotic resistance, altered microbiome, interference with mother–child interaction, and high healthcare costs. Our study aimed to describe the use of antibiotics and other aspects of early- and late-onset sepsis management by European Neonatal Intensive Care Units. Our findings could improve the treatment of neonatal sepsis by highlighting areas in need of further improvements, such as implementing new guidelines focused on establishing antibiotic termination and tuning antibiotic therapy for late-onset sepsis or necrotizing enterocolitis. **View this paper (https://www.mdpi.com/2079-6382/10/9/1046)**

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Antibiofilm Potential of Medicinal Plants against *Candida* spp. Oral Biofilms: A Review (/2079-6382/10/9/1142)

by **Rafaela Guimarães (https://sciprofiles.com/profile/1607268)**, **Catarina Milho (https://sciprofiles.com/profile/1594390)**, **Ângela Liberal (https://sciprofiles.com/profile/1361698)**, **Jani Silva (https://sciprofiles.com/profile/2394600)**, **Carmélia Fonseca (https://sciprofiles.com/profile/author/OXQ3UVVlY1I4R2syZXdyYVd1ZGc0cjVDNEp2bjF0dUx5NXVSdEpleGVoMW1KaXl5Wm**, **Ana Barbosa (https://sciprofiles.com/profile/author/SDdVU1lEazBYdlhvclJKaG5CZk0rc241TUN0MGZ3ZDNYRldJMVpJMmcxRT0=)**, **Isabel C. F. R. Ferreira (https://sciprofiles.com/profile/7808)**, **Maria José Alves (https://sciprofiles.com/profile/275298)** and **Lillian Barros (https://sciprofiles.com/profile/428642)**

Antibiotics **2021**, *10*(9), 1142; **https://doi.org/10.3390/antibiotics10091142 (https://doi.org/10.3390/antibiotics10091142)** - 21 Sep 2021

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Abstract The use of natural products to promote health is as old as human civilization. In recent years, the perception of natural products derived from plants as abundant sources of biologically active compounds has driven their exploitation towards the search for new chemical products **[...] Read more.**

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Antibacterial Effect of Sodium Hypochlorite and EDTA in Combination with High-Purity Nisin on an Endodontic-like Biofilm Model (/2079-6382/10/9/1141)

by **Ericka T. Pinheiro (https://sciprofiles.com/profile/1352803)**, **Lamprini Karygianni (https://sciprofiles.com/profile/886818)**, **Thomas Attin (https://sciprofiles.com/profile/author/bUxEVXF6NncvQ0JjZjhQa2ZnMUtrUWZlY21xejQwb01mTXFSc2p5ZDJCaz0=)** and **Thomas Thurnheer (https://sciprofiles.com/profile/514732)**

Antibiotics **2021**, *10*(9), 1141; **https://doi.org/10.3390/antibiotics10091141 (https://doi.org/10.3390/antibiotics10091141)** - 21 Sep 2021

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Abstract Antimicrobial peptides have been proposed as antibiofilm agents. Therefore, we evaluated the effect of endodontic irrigants combined or not with the antimicrobial peptide nisin against an endodontic biofilm model composed of eleven bacterial species. Biofilms were grown on hydroxyapatite discs for 3, 15 **[...] Read more.**

(This article belongs to the Special Issue **Oral Microorganisms and Inactivation of Oral Biofilms (/journal/antibiotics/special_issues/oral_biofilm)**)

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Detection of Multidrug-Resistant *Enterobacterales*—From ESBLs to Carbapenemases (/2079-6382/10/9/1140)

by **Janina Noster (https://sciprofiles.com/profile/1399390)**, **Philipp Thelen (https://sciprofiles.com/profile/1784586)** and **Axel Hamprecht (https://sciprofiles.com/profile/1376985)**

Antibiotics **2021**, *10*(9), 1140; **https://doi.org/10.3390/antibiotics10091140 (https://doi.org/10.3390/antibiotics10091140)** - 21 Sep 2021

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Abstract Multidrug-resistant *Enterobacterales* (MDRE) are an emerging threat to global health, leading to rising health care costs, morbidity and mortality. Multidrug-resistance is commonly caused by different β-lactamases (e.g., ESBLs and carbapenemases), sometimes in combination with other resistance mechanisms (e.g., porin loss, efflux). The continuous **[...] Read more.**

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Delayed Rifampin Administration in the Antibiotic Treatment of Periprosthetic Joint Infections Significantly Reduces the Emergence of Rifampin Resistance (/2079-6382/10/9/1139)

by **Ali Darwich (https://sciprofiles.com/profile/1419196)**, **Franz-Joseph Dally (https://sciprofiles.com/profile/author/OUhrZUppSUpGanZKMklRZUhVdTZkL0RmR3M5NnRWMlVReXptSjA1ZlkvUT0=)**, **Mohamad Bdeir (https://sciprofiles.com/profile/author/NElZWkozaXZqV2V2Uy9ObmlrMGVma3RIOEJnSHBCRUVrMlgyZEt0dU5Obz0=)**, **Katharina Kehr (https://sciprofiles.com/profile/author/MXdRaDlseXYyZitndHdSWU9qTk9nNTlCZ2tEOGNza01VMUk4UC8vbzdBVT0=)**, **Thomas Miethke (https://sciprofiles.com/profile/152886)**, **Svetlana Hetjens (https://sciprofiles.com/profile/author/STVtS2ljL2JDSjRyZ1piUEsxemQwU2lUV2NoTU1JMjloWlNaQmtFL3g5WHZsQ3Y2N0taN**, **Sascha Gravius (https://sciprofiles.com/profile/2042811)**, **Elio Assaf (https://sciprofiles.com/profile/author/TURNOVpYZ1c4ZkhWZ1ovSXIlb09XMW1SQXd6ZlZZV3NFaVdmMVRXSERGbz0=)** and **Elisabeth Mohs (https://sciprofiles.com/profile/author/K0ordzJnMmpITjNsdVRlQjhGRGk0U29yS216NnlQV1cxT25zZ0xXSjd1Yz0=)**

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Abstract Rifampin is one of the most important biofilm-active antibiotics in the treatment of periprosthetic joint infection (PJI), and antibiotic regimens not involving rifampin were shown to have higher failure rates. Therefore, an emerging rifampin resistance can have a devastating effect on the outcome **[...] Read more.**

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Iron Oxide–Silica Core–Shell Nanoparticles Functionalized with Essential Oils for Antimicrobial Therapies (/2079-6382/10/9/1138)

by **Cristina Chircov (https://sciprofiles.com/profile/560848)**, **Maria-Florentina Matei (https://sciprofiles.com/profile/author/UXZlczdWaDdvMVh0TjZyM2YxVDZBYWZsQmJsaHluQXhuci9mcXpYbXN6eVp0M**, **Ionela Andreea Neacșu (https://sciprofiles.com/profile/572128)**, **Bogdan Stefan Vasile (https://sciprofiles.com/profile/73054)**, **Ovidiu-Cristian Oprea (https://sciprofiles.com/profile/1020711)**, **Alexa-Maria Croitoru (https://sciprofiles.com/profile/2210950)**, **Roxana-Doina Trușcă (https://sciprofiles.com/profile/author/LzFlQUU4QXI2cnRxbFhUbDRzcTNTMEJEZFhnNEpUcll1dnpUUmorbWpiWT0=)**, **Ecaterina Andronescu (https://sciprofiles.com/profile/474188)**, **Ionuț Sorescu (https://sciprofiles.com/profile/1790566)** and **Florica Bărbuceanu (https://sciprofiles.com/profile/1723742)**

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Abstract Recent years have witnessed a tremendous interest in the use of essential oils in biomedical applications due to their intrinsic antimicrobial, antioxidant, and anticancer properties. However, their low aqueous solubility and high volatility compromise their maximum potential, thus requiring the development of efficient **[...] Read more.**

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Open Access Article **(/2079-6382/10/9/1137/pdf?version=1632206861)**

Occurrence of Multi-Drug-Resistant *Escherichia coli* in Chickens, Humans, Rodents and Household Soil in Karatu, Northern Tanzania (/2079-6382/10/9/1137)

by **Valery S. Sonola (https://sciprofiles.com/profile/1692987)**, **Abdul S. Katakweba (https://sciprofiles.com/profile/2000376)**, **Gerald Misinzo (https://sciprofiles.com/profile/872920)** and **Mecky I. N. Matee (https://sciprofiles.com/profile/1302439)**

Antibiotics **2021**, *10*(9), 1137; **https://doi.org/10.3390/antibiotics10091137 (https://doi.org/10.3390/antibiotics10091137)** - 21 Sep 2021

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Abstract We investigated antibiotic resistance profiles of *Escherichia coli* among 960 samples obtained from chickens (236), humans (243), rodents (101) and soil (290). *E. coli* was isolated from 650 (67.7%) samples. Isolation frequency varied significantly between chickens, humans, rodents and soil samples, being 81.6%, **[...] Read more.**

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Open Access Article **(/2079-6382/10/9/1136/pdf?version=1632378140)**

LyeTx I-b Peptide Attenuates Tumor Burden and Metastasis in a Mouse 4T1 Breast Cancer Model (/2079-6382/10/9/1136)

by **Mostafa A. L. Abdel-Salam (https://sciprofiles.com/profile/1771889)**, **Bárbara Pinto (https://sciprofiles.com/profile/1374539)**, **Geovanni Cassali (https://sciprofiles.com/profile/author/cnluL0NXZ2dhNUs0d3hlSlZENmlET2QwdFlaUlRZZFdRQUtQWlVyaXFudz0=)**, **Lilian Bueno (https://sciprofiles.com/profile/author/ai9jTElpZnBzdHZHVnZITFRqRVRFeHo3UiswTUQ5aEdGYVZHUkUySkhKUT0=)**, **Gabriela Pêgas (https://sciprofiles.com/profile/author/UGVGQXpkY05OVWYwTWZwWUtxeTBYcWZkb2N2WXFUTFVsQVRZb2VyRitvMD0=)**, **Fabrício Oliveira (https://sciprofiles.com/profile/author/Q1dLV0lyMThjUmVJNFo4RDdOd2tDZXFzdTNuaFQ4dkY4ellZYnFkQ20xND0=)**, **Irismara Silva (https://sciprofiles.com/profile/author/c1hJNHBCNWhodUlPK0VTNTAvNUoxVi84eFZEL1dWQXYvZ2dOYkNlbVdvaz0=)**, **André Klein (https://sciprofiles.com/profile/author/TlJrZVA0NlFDalpZTnlkSVV6YmdENUVpZ2RRY0pDR0lTRFp0ZFhrVm8vRT0=)**, **Elaine Maria de Souza-Fagundes (https://sciprofiles.com/profile/1773492)**, **Maria Elena de Lima (https://sciprofiles.com/profile/364767)** and **Juliana Carvalho-Tavares (https://sciprofiles.com/profile/author/aFRHNkdvalNYaStsWDZVMGVCeFB1L0ZyUmh5N1pObFJiTHFMTHlCU3pyTT0**

Antibiotics **2021**, *10*(9), 1136; **https://doi.org/10.3390/antibiotics10091136 (https://doi.org/10.3390/antibiotics10091136)** - 21 Sep 2021

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Abstract Cationic anticancer peptides have exhibited potent anti-proliferative and anti-inflammatory effects in neoplastic illness conditions. LyeTx I-b is a synthetic peptide derived from *Lycosa erythrognatha* spider venom that previously showed antibiotic activity in vitro and in vivo. This study focused on the effects of **[...] Read more.**

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Open Access Article **(/2079-6382/10/9/1135/pdf?version=1632377265)**

Assessing the Bacterial Community Composition of Bivalve Mollusks Collected in Aquaculture Farms and Respective Susceptibility to Antibiotics (/2079-6382/10/9/1135)

by **Vanessa Salgueiro (https://sciprofiles.com/profile/1217422)**, **Lígia Reis (https://sciprofiles.com/profile/author/V1pJQUJQTDFQaStpM0RKSFpLa0pXNXFYbWJRUldRRUZoMUx5cUNHM3dmVT0=)**, **Eugénia Ferreira (https://sciprofiles.com/profile/author/aWpDT2lqQUhQQ0FqeHU1dEJ2UzBiYkpDYmhEMFE0NEhFblZZQnUvREZTWWYrdnVa**

, **Maria João Botelho (https://sciprofiles.com/profile/614865)**, **Vera Manageiro (https://sciprofiles.com/profile/255396)** and **Manuela Caniça (https://sciprofiles.com/profile/793604)**

Antibiotics **2021**, *10*(9), 1135; **https://doi.org/10.3390/antibiotics10091135 (https://doi.org/10.3390/antibiotics10091135)** - 20 Sep 2021

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Abstract Aquaculture is a growing sector, providing several products for human consumption, and it is therefore important to guarantee its quality and safety. This study aimed to contribute to the knowledge of bacterial composition of *Crassostrea gigas*, *Mytilus* spp. and *Ruditapes decussatus*, **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Resistance: From Farm to Fork (/journal/antibiotics/special_issues/Farm_Fork)**)

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Open Access Article **(/2079-6382/10/9/1134/pdf?version=1632372666)**

No Correlation between Biofilm Formation, Virulence Factors, and Antibiotic Resistance in *Pseudomonas aeruginosa*: Results from a Laboratory-Based In Vitro Study (/2079-6382/10/9/1134)

by **Márió Gajdács (https://sciprofiles.com/profile/317381)**, **Zoltán Baráth (https://sciprofiles.com/profile/2129611)**, **Krisztina Kárpáti (https://sciprofiles.com/profile/author/YS9JSytPbDFocHpXV2hCSDZZTzNpYnR0Q2JBVlpnb1B5SHZwZVlVQms3ST0=)**, **Dóra Szabó (https://sciprofiles.com/profile/1312432)**, **Donatella Usai (https://sciprofiles.com/profile/1072694)**, **Stefania Zanetti (https://sciprofiles.com/profile/1055514)** and **Matthew Gavino Donadu (https://sciprofiles.com/profile/426154)**

Antibiotics **2021**, *10*(9), 1134; **https://doi.org/10.3390/antibiotics10091134 (https://doi.org/10.3390/antibiotics10091134)** - 20 Sep 2021

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Abstract *Pseudomonas aeruginosa* (*P. aeruginosa*) possesses a plethora of virulence determinants, including the production of biofilm, pigments, exotoxins, proteases, flagella, and secretion systems. The aim of our present study was to establish the relationship between biofilm-forming capacity, the expression of some important **[...] Read more.**

(This article belongs to the Special Issue **Diagnosis and Treatment of Biofilm-Related Infections (/journal/antibiotics/special_issues/BiofilmRelated_antibiotics)**)

Open Access Article **(/2079-6382/10/9/1133/pdf?version=1632369900)**

Prevalence and Antibiotic Resistance Profile of Bacterial Pathogens in Aerobic Vaginitis: A Retrospective Study in Italy (/2079-6382/10/9/1133)

by **Enrica Serretiello (https://sciprofiles.com/profile/1763344)**, **Biagio Santella (https://sciprofiles.com/profile/1129679)**, **Veronica Folliero (https://sciprofiles.com/profile/2257621)**, **Domenico Iervolino (https://sciprofiles.com/profile/1808609)**, **Emanuela Santoro (https://sciprofiles.com/profile/author/TWYvODJPMFdKRzQ0cS96MHRpNis4Wm1BTG9NU1pNbUdmTHUrZ3VaVXpqUT0=)**, **Roberta Manente (https://sciprofiles.com/profile/1809284)**, **Federica Dell'Annunziata (https://sciprofiles.com/profile/1817570)**, **Rossella Sperlongano (https://sciprofiles.com/profile/author/WEtwRUtMZFB2RmI5MEFVa0RoeFA1Rzg5N3lNU2JWOEd1S0NQOTc1SXcxdXpkR**

, **Valeria Crudele (https://sciprofiles.com/profile/author/QnVDMDF2R0xZSS9YWmUwU0o1UnRaT2xNWituakROOHlrVnRBSFRwTjdVVT0=)**, **Anna De Filippis (https://sciprofiles.com/profile/1713305)**, **Massimiliano Galdiero (https://sciprofiles.com/profile/1017815)**, **Gianluigi Franci (https://sciprofiles.com/profile/960173)** and **Giovanni Boccia (https://sciprofiles.com/profile/1277572)**

Antibiotics **2021**, *10*(9), 1133; **https://doi.org/10.3390/antibiotics10091133 (https://doi.org/10.3390/antibiotics10091133)** - 20 Sep 2021

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Abstract Aerobic vaginitis (AV) is a vaginal infectious condition, characterized by a high inflammatory response and/or signs of epithelial atrophy, a decrease in the amount of *Lactobacillus* spp. and an increase in enteric origin bacteria. AV, often misdiagnosed, is difficult to treat due to **[...] Read more.**
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Antifungal Nanoformulation for Biocontrol of Tomato Root and Crown Rot Caused by *Fusarium oxysporum* f. sp. *radicis-lycopersici* (/2079-6382/10/9/1132)

by Ricardo Aravena (https://sciprofiles.com/profile/author/bTlRSVFNQlIHR0FQdG9rQ2MwRGJGdzNhLytpM2tOUEVqMFZUeDBnbElxOD0=), Ximena Besoain (https://sciprofiles.com/profile/1124158), Natalia Riquelme (https://sciprofiles.com/profile/author/b3dLSE54ekJ5TjlZbEw5OWZkZ3hhZ0pmeHZ6bS9ZNDFCVnJ5OTk0UGdQWT0=), Aldo Salinas (https://sciprofiles.com/profile/author/ZUJGNUJOeTF5NFY4R3Z3TjJ1TjB4MU9pWVNPVXR2MXBSK1laK0M4MVpJUT0=), Miryam Valenzuela (https://sciprofiles.com/profile/483352), Eduardo Oyanedel (https://sciprofiles.com/profile/author/NXptRVpYTUJxelRHTHNpb252eGhEZVp3Y2l6U1JZWDRZUE9lZitPTXQ5dz0=), Wilson Barros (https://sciprofiles.com/profile/1552545), Yusser Olguin (https://sciprofiles.com/profile/1210179), Alejandro Madrid (https://sciprofiles.com/profile/108552), Matias Alvear (https://sciprofiles.com/profile/author/MTR2a3RrYmZhcENmVWdwZkZOSE1vaHNNMjJFWmdidU8rcUZ6M1BCcG92OD0=) and Iván Montenegro (https://sciprofiles.com/profile/471113)
Antibiotics **2021**, *10*(9), 1132; https://doi.org/10.3390/antibiotics10091132 (https://doi.org/10.3390/antibiotics10091132) - 20 Sep 2021

Abstract Tomatoes (*Solanum lycopersicum* L.) are the most cultivated and important vegetable crop in the world. These plants can wilt during crop growth due to fusarium wilt (fusariosis), a disease that damages tomato vascular systems. The *Fusarium* isolated and analyzed in this work **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Activity of Plant-Derived Products and Synthetic Derivatives (/journal/antibiotics/special_issues/Plant-derived_Products)**)

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Management of Common Infections in German Primary Care: A Cross-Sectional Survey of Knowledge and Confidence among General Practitioners and Outpatient Pediatricians (/2079-6382/10/9/1131)

by Peter Konstantin Kurotschka (https://sciprofiles.com/profile/1416194), Elena Tiedemann (https://sciprofiles.com/profile/1821675), Dominik Wolf (https://sciprofiles.com/profile/author/WG5XZ0ZnL1NaamFLY1M3c01pMkR0M0YyTUJtdzF1ZzBMQ1pkMmRpbjNtaz0=), Nicola Thier (https://sciprofiles.com/profile/author/S2JCKzBRYXpDZlJ4aFA1clpuRW9mOHNlUmlPd0dNVzA2UjlzbElVdXFEST0=), Johannes Forster (https://sciprofiles.com/profile/1930478), Johannes G. Liese (https://sciprofiles.com/profile/author/b2pkVzdVNlNlQmJXdkRPZnY5ZXZ2Zz09) and Ildiko Gagyor (https://sciprofiles.com/profile/1904379)
Antibiotics **2021**, *10*(9), 1131; https://doi.org/10.3390/antibiotics10091131 (https://doi.org/10.3390/antibiotics10091131) - 20 Sep 2021

Abstract Outpatient antibiotic use is closely related to antimicrobial resistance and in Germany, almost 70% of antibiotic prescriptions in human health are issued by primary care physicians (PCPs). The aim of this study was to explore PCPs, namely General Practitioners' (GPs) and outpatient pediatricians' **[...] Read more.**
(This article belongs to the Special Issue **Antibiotics and Infectious Respiratory Diseases (/journal/antibiotics/special_issues/Respiratory_Disease)**)

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Predictors of Voriconazole Trough Concentrations in Patients with Child–Pugh Class C Cirrhosis: A Prospective Study (/2079-6382/10/9/1130)

by Yichang Zhao (https://sciprofiles.com/profile/1754021), Jingjing Hou (https://sciprofiles.com/profile/author/T3IZU01DNVJ3U0dROENwejViSTkwRFVSZk8wWElHdlJyTXR1Ynp1RWErdz0=), Yiwen Xiao (https://sciprofiles.com/profile/author/ZlNVN0ZxbWJwRFAwSXE3UHFzSW5ObG0vRERrckwySEV5eHNRcVd3OD9jaz0=), Feng Wang (https://sciprofiles.com/profile/author/VTdhZ3BKekhzK3lWSHkyZ1QwZUFDdz09), Bikui Zhang (https://sciprofiles.com/profile/author/Y2x2UmUva2dGaXJ6bERiS211bXFaU2NRY0xHNWx1VUZMZFkyTG9uTkNMdz0=), Min Zhang (https://sciprofiles.com/profile/2323446), Yongfang Jiang (https://sciprofiles.com/profile/author/Q0M0UGRod1VCUlNTeHY5SVVrU0JXaEhxYXVNZk5iOWFoNWpLcXd3c0Nwaz0=), Jiakai Li (https://sciprofiles.com/profile/author/bHB6eUhyRlVweVRPWkdZWFlVa2pqU2ltTS9KN3BkYU9yLzNhNjZhUXRSZz0=), Guozhong Gong (https://sciprofiles.com/profile/738425), Daxiong Xiang (https://sciprofiles.com/profile/346507) and Miao Yan (https://sciprofiles.com/profile/667642)
Antibiotics **2021**, *10*(9), 1130; https://doi.org/10.3390/antibiotics10091130 (https://doi.org/10.3390/antibiotics10091130) - 20 Sep 2021

Abstract This prospective observational study aimed to clinically describe voriconazole administrations and trough concentrations in patients with Child–Pugh class C and to investigate the variability of trough concentration. A total of 144 voriconazole trough concentrations from 43 Child–Pugh class C patients were analyzed. The **[...] Read more.**
(This article belongs to the Special Issue **Appropriateness of Antibiotics in China (/journal/antibiotics/special_issues/China_Antibiotics)**)

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Use of Dalbavancin in Skin, Bone and Joint Infections: A Real-Life Experience in an Italian Center (/2079-6382/10/9/1129)

by Lucia Brescini (https://sciprofiles.com/profile/author/dVdyb2RaS3daRGZvL2NHVEtHMVNBeWpESkhJU01rbkU0NjEyZEhPb0Z5QT0=), Filippo Della Martera (https://sciprofiles.com/profile/author/QXg1cDdsMHg1cmNnMk5jY09TSDVjcFJBVGN3QVBicUs0V3pLTlgwb0U2MD0=), Gianluca Morroni (https://sciprofiles.com/profile/1741461), Sara Mazzanti (https://sciprofiles.com/profile/author/ZmNVQ1ZhZFBycStDYVplMTlxcVd5RVdUUEx2ZThzUFluR3J5SW9kbXFiMD0=), Maria Di Pietrantonio (https://sciprofiles.com/profile/author/Z2NzRDdpT0xybzR4NVhXRW4xSzAwcnJKbExCZlINamViNTU0K0RlUGF5MD0=), Paolo Mantini (https://sciprofiles.com/profile/author/VE9TQkozU0FiYkUrYjk0Z2NlWUhlSWQ4RTNKeUQwNU5vNk1OSEZaM0Z1cz0=), Bianca Candelaresi (https://sciprofiles.com/profile/author/N2J6bVZmSU9BUVp5ZGZ6dVR0SXpkVGZ2V24zdGZOVXF6TGNrQWovc1dKbz0=), Francesco Pallotta (https://sciprofiles.com/profile/2107555), Silvia Olivieri (https://sciprofiles.com/profile/1817127), Valentina Iencinella (https://sciprofiles.com/profile/author/U2lxWjVNSkNLUXlIZVJJTFVScWd4bHRmNjZlc084dlpTZGorSFZjMUZJOD0=), Sefora Castelletti (https://sciprofiles.com/profile/author/Rm83YnF6VGZRQ0NNcURvVEtjdVJEVS9TTDlMR2Vpb3FtTm9nZWNwSThjWT0=), Emanuele Cocci (https://sciprofiles.com/profile/1764166), Rosaria G. Polo (https://sciprofiles.com/profile/author/V0tTTlZvd0xDS3dPNTNpazBHQmNZNXJyTnFFd3N3OUVkYlhOdndWaXJDTnl2bzdaWnJ , Salvatore Veccia (https://sciprofiles.com/profile/author/N2dhTCsyVFM5OWoxVTQ5QUZOUzI4RCt3ZDNQcnlrVk5wam9SUUVOVWV5cjFRZGVG , Oscar Cirioni (https://sciprofiles.com/profile/author/cGY4cmxhT01nZXdlRXNDWGRVVnRLaCtGVGhldUpqbmJjVDlMQWtLVmRZSmk1U2pLdUI , Marcello Tavio (https://sciprofiles.com/profile/author/OGEwSXU5SGNxK0FoNlVKcTBUMjBZSmx3S2tDUDNKbm41WmhNUWdPQysrTVhmbjJ5 and Andrea Giacometti (https://sciprofiles.com/profile/author/RDNnOHkvKzhlRVYyUE03MUNmK0xmRmJKN2VlRnMrNkZWK042czdON0dTUlArZzh
Antibiotics **2021**, *10*(9), 1129; https://doi.org/10.3390/antibiotics10091129 (https://doi.org/10.3390/antibiotics10091129) - 19 Sep 2021

Abstract Dalbavancin is a lipoglycopeptide approved for the treatment of acute bacterial skin and skin structure infections (ABSSSI). The aim of the study was to evaluate the efficacy and safety in all patients who received at least one administration of dalbavancin. Methods: We carried **[...] Read more.**
(This article belongs to the Special Issue **Evaluation of New Molecules in Severe Infectious Diseases (/journal/antibiotics/special_issues/severe_infectious_diseases)**)

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Open Access Article (/2079-6382/10/9/1128/pdf?version=1645666981)

Iriflophenone-3-C-β-d Glucopyranoside from *Dryopteris ramosa* (Hope) C. Chr. with Promising Future as Natural Antibiotic for Gastrointestinal Tract Infections (/2079-6382/10/9/1128)

by Muhammad Ishaque (https://sciprofiles.com/profile/1937552), Yamin Bibi (https://sciprofiles.com/profile/1373719), Samha Al Ayoubi (https://sciprofiles.com/profile/author/Tm0vdE9rY284RGxNaCtYcmhtVytDODBvcjlrT2hteFhXNm5oNlR5TTNXST0=), Saadia Masood (https://sciprofiles.com/profile/886926), Sobia Nisa (https://sciprofiles.com/profile/1391479) and Abdul Qayyum (https://sciprofiles.com/profile/1598653)

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Cited by 2 (/2079-6382/10/9/1128#metrics) | Viewed by 1595 | **Correction (/2079-6382/11/3/301)**

Abstract Ethnopharmacological approaches provide clues for the search of bioactive compounds. *Dryopteris ramosa* (Hope) C. Chr. (plant family: Dryopteridaceae) is an ethnomedicinal plant of the Galliyat region of Pakistan. The aqueous fraction (AqF) of *D. ramosa* is being used by inhabitants of the Galliyat **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Plant Extracts and Phytochemicals, 2nd Volume (/journal/antibiotics/special_issues/anti_plant_2nd)**)

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Open Access Article (/2079-6382/10/9/1127/pdf?version=1631963243)

A Study in a Regional Hospital of a Mid-Sized Spanish City Indicates a Major Increase in Infection/Colonization by Carbapenem-Resistant Bacteria, Coinciding with the COVID-19 Pandemic (/2079-6382/10/9/1127)

by
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and
José Gutiérrez-Fernández (https://sciprofiles.com/profile/1154816)
Antibiotics **2021**, *10*(9), 1127; **https://doi.org/10.3390/antibiotics10091127 (https://doi.org/10.3390/antibiotics10091127)** - 18 Sep 2021
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Abstract Bacterial resistance to antibiotics has proven difficult to control over the past few decades. The large group of multidrug-resistant bacteria includes carbapenemase-producing bacteria (CPB), for which limited therapeutic options and infection control measures are available. Furthermore, carbapenemases associate with high-risk clones that are **[...] Read more.**
(This article belongs to the Special Issue **Carbapenemase-Producing Enterobacterales (/journal/antibiotics/special_issues/Carbapenemase)**)

Open Access Review (/2079-6382/10/9/1126/pdf?version=1632291874)

Review of Ceftazidime-Avibactam for the Treatment of Infections Caused by *Pseudomonas aeruginosa* (/2079-6382/10/9/1126)

by **George L. Daikos (https://sciprofiles.com/profile/1713858)**,
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Antibiotics **2021**, *10*(9), 1126; **https://doi.org/10.3390/antibiotics10091126 (https://doi.org/10.3390/antibiotics10091126)** - 18 Sep 2021
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Abstract *Pseudomonas aeruginosa* is an opportunistic Gram-negative pathogen that causes a range of serious infections that are often challenging to treat, as this pathogen can express multiple resistance mechanisms, including multidrug-resistant (MDR) and extensively drug-resistant (XDR) phenotypes. Ceftazidime–avibactam is a combination antimicrobial agent comprising **[...] Read more.**

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Periprosthetic Infections of the Shoulder Joint: Characteristics and 5-Year Outcome of a Single-Center Series of 19 Cases (/2079-6382/10/9/1125)

by **Mohamad Bdeir (https://sciprofiles.com/profile/author/NElZWkozaXZqV2V2Uy9ObmlrMGVma3RlOEJnSHBCRUVrMlgyZEt0dU5Obz0=)**,
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and
Ali Darwich (https://sciprofiles.com/profile/1419196)
Antibiotics **2021**, *10*(9), 1125; **https://doi.org/10.3390/antibiotics10091125 (https://doi.org/10.3390/antibiotics10091125)** - 18 Sep 2021
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Abstract Periprosthetic shoulder infection (PSI) remains a devastating complication after total shoulder arthroplasty (TSA). Furthermore, there is a paucity in the literature regarding its diagnostic and therapeutic management, especially the absence of therapy concepts devised exclusively for PSI. The aim of the presenting study **[...] Read more.**
(This article belongs to the Special Issue **Antibiotics in Orthopedic Infections (/journal/antibiotics/special_issues/orthopedic_infec)**)

Open Access Article (/2079-6382/10/9/1124/pdf?version=1631927885)

Understanding Antibiotic Usage on Small-Scale Dairy Farms in the Indian States of Assam and Haryana Using a Mixed-Methods Approach—Outcomes and Challenges (/2079-6382/10/9/1124)

by **Naresh Kumar (https://sciprofiles.com/profile/author/YldnbThoQTBGREQzS0NDUkQzUnU4NCtYOEN0N0NUVHV5cWJMNTNnK28yST0=)**,
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Antibiotics **2021**, *10*(9), 1124; **https://doi.org/10.3390/antibiotics10091124 (https://doi.org/10.3390/antibiotics10091124)** - 18 Sep 2021
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Abstract The use and misuse of antibiotics in both humans and animals contributes to the global emergence of antimicrobial resistant (AMR) bacteria, a threat to public health and infection control. Currently, India is the world's leading milk producer but antibiotic usage within the dairy **[...] Read more.**
(This article belongs to the Special Issue **Social Dimensions of Antibiotic Resistance in Asia - a One Health Perspective (/journal/antibiotics/special_issues/Asia_antibiotics)**)

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Over-the-Counter Sale of Antibiotics in India: A Qualitative Study of Providers' Perspectives across Two States (/2079-6382/10/9/1123)

by **Anita Kotwani (https://sciprofiles.com/profile/1743481)**,
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Antibiotics **2021**, *10*(9), 1123; **https://doi.org/10.3390/antibiotics10091123 (https://doi.org/10.3390/antibiotics10091123)** - 17 Sep 2021
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Abstract India has one of the highest rates of antimicrobial resistance (AMR) worldwide. Despite being prescription drugs, antibiotics are commonly available over-the-counter (OTC) at retail pharmacies. We aimed to gain insight into the OTC sale of antibiotics at retail pharmacies and to elucidate its **[...] Read more.**
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Open Access Article (/2079-6382/10/9/1122/pdf?version=1634182772)

Antibiotic Prescribing Patterns in Ghana, Uganda, Zambia and Tanzania Hospitals: Results from the Global Point Prevalence Survey (G-PPS) on Antimicrobial Use and Stewardship Interventions Implemented (/2079-6382/10/9/1122)

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Abstract Antimicrobial resistance (AMR) remains an important global public health issue with antimicrobial misuse and overuse being one of the main drivers. The Global Point Prevalence Survey (G-PPS) of Antimicrobial Consumption and Resistance assesses the prevalence and the quality of antimicrobial prescriptions across hospitals [...] Read more.
(This article belongs to the Special Issue Antimicrobial Prescribing and Stewardship, 2nd Volume (/journal/antibiotics/special_issues/Stewardship_2nd))

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Genomic Investigation of Methicillin-Resistant *Staphylococcus aureus* ST113 Strains Isolated from Tertiary Care Hospitals in Pakistan (/2079-6382/10/9/1121)

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Antibiotics **2021**, *10*(9), 1121; https://doi.org/10.3390/antibiotics10091121 (https://doi.org/10.3390/antibiotics10091121) - 17 Sep 2021
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Abstract Methicillin-resistant *Staphylococcus aureus* (MRSA) is a multi-drug resistant and opportunistic pathogen. The emergence of new clones of MRSA in both healthcare settings and the community warrants serious attention and epidemiological surveillance. However, epidemiological data of MRSA isolates from Pakistan are limited. We performed [...] Read more.
(This article belongs to the Special Issue Molecular Evolution and Pathogenicity of Methicillin-Resistant *Staphylococcus aureus* (/journal/antibiotics/special_issues/MRSA_Antibiotics))

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Open Access Article (/2079-6382/10/9/1120/pdf?version=1631850821)

Local Trends of Antibiotic Prescriptions for Necrotizing Fasciitis Patients in Two Tertiary Care Hospitals in Central Malaysia (/2079-6382/10/9/1120)

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Abstract Background: Necrotizing fasciitis (NF) is a rapidly progressive inflammatory infection of the soft tissue (also known as the fascia) with a secondary necrosis of the subcutaneous tissues, leading to a systemic inflammatory response syndrome (SIRS), shock and eventually death despite the availability of [...] Read more.
(This article belongs to the Special Issue 10th Anniversary of Antibiotics — Recent Advances in Rational Antimicrobial Use (/journal/antibiotics/special_issues/Anniversary_Use))

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Procalcitonin to Guide Antibacterial Prescribing in Patients Hospitalised with COVID-19 (/2079-6382/10/9/1119)

by Stephen Hughes (https://sciprofiles.com/profile/1750311),
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Antibiotics **2021**, *10*(9), 1119; https://doi.org/10.3390/antibiotics10091119 (https://doi.org/10.3390/antibiotics10091119) - 17 Sep 2021
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Abstract Antibacterial prescribing in patients presenting with COVID-19 remains discordant to rates of bacterial co-infection. Implementing diagnostic tests to exclude bacterial infection may aid reduction in antibacterial prescribing. (1) Method: A retrospective observational analysis was undertaken of all hospitalised patients with COVID-19 across a [...] Read more.
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Open Access Editor's Choice Article (/2079-6382/10/9/1118/pdf?version=1631950178)

Environmental and Pathogenic Carbapenem Resistant Bacteria Isolated from a Wastewater Treatment Plant Harbour Distinct Antibiotic Resistance Mechanisms (/2079-6382/10/9/1118)

by Micaela Oliveira (https://sciprofiles.com/profile/1784020), Inês Carvalho Leonardo (https://sciprofiles.com/profile/1502122),
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Abstract Wastewater treatment plants are important reservoirs and sources for the dissemination of antibiotic resistance into the environment. Here, two different groups of carbapenem resistant bacteria—the potentially environmental and the potentially pathogenic—were isolated from both the wastewater influent and discharged effluent of a full-scale [...] Read more.
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Open Access Review (/2079-6382/10/9/1117/pdf?version=1632197691)

Clinical Status of Efflux Resistance Mechanisms in Gram-Negative Bacteria (/2079-6382/10/9/1117)

by Anne Davin-Regli (https://sciprofiles.com/profile/946670), Jean-Marie Pages (https://sciprofiles.com/profile/253581) and
Aurélie Ferrand (https://sciprofiles.com/profile/author/dWxrNGtLcm5Sa2Z3NE41NFR5QlpDdUNyMm5STWc0U3hEN1loRWRuaUFCaz0=)
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Abstract Antibiotic efflux is a mechanism that is well-documented in the phenotype of multidrug resistance in bacteria. Efflux is considered as an early facilitating mechanism in the bacterial adaptation face to the concentration of antibiotics at the infectious site, which is involved in the [...] Read more.
(This article belongs to the Special Issue The Structural and Functional Study of Efflux Pumps Belonging to the RND Transporters Family from Gram-Negative Bacteria (/journal/antibiotics/special_issues/Efflux_Pumps))

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Alternatives to Fight Vancomycin-Resistant *Staphylococci* and *Enterococci* (/2079-6382/10/9/1116)

by Benjamin Baëtz (https://sciprofiles.com/profile/1812936),
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Antibiotics **2021**, *10*(9), 1116; https://doi.org/10.3390/antibiotics10091116 (https://doi.org/10.3390/antibiotics10091116) - 16 Sep 2021
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Abstract Gram positive pathogens are a significant cause of healthcare-associated infections, with *Staphylococci* and *Enterococci* being the most prevalent ones. Vancomycin, a last resort glycopeptide, is used to fight these bacteria but the emergence of resistance against this drug leaves some patients with few [...] Read more.
(This article belongs to the Special Issue Antibiotics and Antimicrobials Resistance: Mechanisms and New Strategies to Fight Resistant Bacteria (/journal/antibiotics/special_issues/Antibiotic_Resist))

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Open Access Article (/2079-6382/10/9/1115/pdf?version=1631779348) (/toggle_desktop_layout_cookie)

[Aerosolized Hypertonic Saline Hinders Biofilm Formation to Enhance Antibiotic Susceptibility of Multidrug-Resistant *Acinetobacter baumannii* (/2079-6382/10/9/1115)]

by Hui-Ling Lin (https://sciprofiles.com/profile/1864827),
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Antibiotics **2021**, *10*(9), 1115; https://doi.org/10.3390/antibiotics10091115 (https://doi.org/10.3390/antibiotics10091115) - 15 Sep 2021
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Abstract Limited therapeutic options are available for multidrug-resistant *Acinetobacter baumannii* (MDR-AB), and the development of effective treatments is urgently needed. The efficacy of four aerosolized antibiotics (gentamicin, amikacin, imipenem, and meropenem) on three different MDR-AB strains was evaluated using hypertonic saline (HS, 7 g/100 **[...] Read more.**
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Open Access Article (/2079-6382/10/9/1114/pdf?version=1631855950)

[Supplementation of Live Yeast, Mannan Oligosaccharide, and Organic Selenium during the Adaptation Phase of Newly Arrived Beef Cattle: Effects on Health Status, Immune Functionality, and Growth Performance (/2079-6382/10/9/1114)]

by Silvia Grossi (https://sciprofiles.com/profile/1566530), Matteo Dell'Anno (https://sciprofiles.com/profile/931538),
Luciana Rossi (https://sciprofiles.com/profile/98843),
Riccardo Compiani (https://sciprofiles.com/profile/author/ckFSZ2tPbjFwb2Jra3hLSzczdHBKcHducDZhUHhsM0tXNHF3OXZvM3Zlbz0=) and
Carlo Angelo Sgoifo Rossi (https://sciprofiles.com/profile/author/Mnd4aG92d3hCTGwvS1B2bzlPaVduendmVkN6c0dqMlJ2WGVRaEZoWVBtYz
Antibiotics **2021**, *10*(9), 1114; https://doi.org/10.3390/antibiotics10091114 (https://doi.org/10.3390/antibiotics10091114) - 15 Sep 2021
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Abstract The effect of a nutraceutical mixture, based on live yeast (LY), mannan oligosaccharides (MOS) and organic selenium (Se) on health status, as well as immune functionality and growth performance in the fattening of newly received beef cattle, was evaluated. A total of 1036 **[...] Read more.**
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[Empowering Patients to Self-Manage Common Infections: Qualitative Study Informing the Development of an Evidence-Based Patient Information Leaflet (/2079-6382/10/9/1113)]

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Antibiotics **2021**, *10*(9), 1113; https://doi.org/10.3390/antibiotics10091113 (https://doi.org/10.3390/antibiotics10091113) - 15 Sep 2021
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Abstract Common self-limiting infections can be self-managed by patients, potentially reducing consultations and unnecessary antibiotic use. This qualitative study informed by the Theoretical Domains Framework (TDF) aimed to explore healthcare professionals' (HCPs) and patients' needs on provision of self-care and safety-netting advice for common **[...] Read more.**
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[Concomitant Treatment with Voriconazole and Flucloxacillin: A Combination to Avoid (/2079-6382/10/9/1112)]

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Antibiotics **2021**, *10*(9), 1112; https://doi.org/10.3390/antibiotics10091112 (https://doi.org/10.3390/antibiotics10091112) - 15 Sep 2021
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Abstract Background: Voriconazole is an antifungal drug used as one of the first-line treatments for invasive aspergillosis. This drug is extensively metabolized, predominantly via cytochrome P450 enzymes. An interaction between flucloxacillin and voriconazole, leading to subtherapeutic voriconazole concentrations, has previously been reported. We aimed **[...] Read more.**
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[New Insight on Antibiotic Resistance and Virulence of *Escherichia coli* from Municipal and Animal Wastewater (/2079-6382/10/9/1111)]

by Gabriela Gregova (https://sciprofiles.com/profile/1276466),
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Antibiotics **2021**, *10*(9), 1111; https://doi.org/10.3390/antibiotics10091111 (https://doi.org/10.3390/antibiotics10091111) - 14 Sep 2021
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Abstract Antibiotic resistance of the indicator microorganism *Escherichia coli* was investigated in isolates from samples collected during the course of one year from two wastewater treatment plants treating municipal and animal wastes in Slovakia, respectively. The genes of antibiotic resistance and virulence factors in **[...] Read more.**
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[Rapid Detection of Multiple Classes of β-Lactam Antibiotics in Blood Using an NDM-1 Biosensing Assay (/2079-6382/10/9/1110)]

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Antibiotics **2021**, *10*(9), 1110; https://doi.org/10.3390/antibiotics10091110 (https://doi.org/10.3390/antibiotics10091110) - 14 Sep 2021
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Abstract Currently, assays for rapid therapeutic drug monitoring (TDM) of β-lactam antibiotics in blood, which might be of benefit in optimizing doses for treatment of critically ill patients, remain challenging. Previously, we developed an assay for determining the penicillin-class antibiotics in blood using a **[...] Read more.**

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The Biology of Colicin M and Its Orthologs (/2079-6382/10/9/1109)

by **Dimitri Chérier (https://sciprofiles.com/profile/author/NEpTU2pFbmd1Y0x6V3lvcGg4UlVvcEREOHZ2T0ZOY3lsY2hYcnRnVzZGdz0=)**, **Delphine Patin (https://sciprofiles.com/profile/author/UE9lSXhPejh6b0dmUlhyejBjNHJqdjVOZlJoSTl0bnpLVHY0MVY4cFZTWXdZTmh4VUtUZk**, **Didier Blanot (https://sciprofiles.com/profile/author/K3k1bFRxV3BQcU52M3FwOEowMzhjL2N3N3M2TTJhaTNNYUFScWc1bUJFYz0=)**, **Thierry Touzé (https://sciprofiles.com/profile/author/eVdGaUV5dFNzMG44L0UwZUtpam5WSS9janhQMHU1TUNpQ0FXL2lJcWsxTFNRd1gvM3F** and **Hélène Barreteau (https://sciprofiles.com/profile/191335)**

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Abstract The misuse of antibiotics during the last decades led to the emergence of multidrug resistant pathogenic bacteria. This phenomenon constitutes a major public health issue. Consequently, the discovery of new antibacterials in the short term is crucial. Colicins, due to their antibacterial properties, **[...] Read more.**

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Prevalence and Characteristics of *Staphylococcus aureus* Associated with Meat and Meat Products in African Countries: A Review (/2079-6382/10/9/1108)

by **Thembeka Thwala (https://sciprofiles.com/profile/author/L0cwSkt4SGZYUC9idTVCSVdxN0M2VHVPRG9mOUdVL0VkTlJDTUVlNmg3bz0=)**, **Evelyn Madoroba (https://sciprofiles.com/profile/115032)**, **Albert Basson (https://sciprofiles.com/profile/622640)** and **Patrick Butaye (https://sciprofiles.com/profile/197172)**

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Abstract Antimicrobial resistance has been increasing globally, which negatively affects food safety, veterinary, and human medicine. Ineffective antibiotics may cause treatment failure, which results in prolonged hospitalisation, increased mortality, and consequently, increased health care costs. *Staphylococcus aureus* causes a diverse range of infections including **[...] Read more.**

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Public Health Literacy, Knowledge, and Awareness Regarding Antibiotic Use and Antimicrobial Resistance during the COVID-19 Pandemic: A Cross-Sectional Study (/2079-6382/10/9/1107)

by **Suhaib M. Muflih (https://sciprofiles.com/profile/1494839)**, **Sayer Al-Azzam (https://sciprofiles.com/profile/735394)**, **Reema A. Karasneh (https://sciprofiles.com/profile/945744)**, **Barbara R. Conway (https://sciprofiles.com/profile/108401)** and **Mamoon A. Aldeyab (https://sciprofiles.com/profile/1382086)**

Antibiotics **2021**, *10*(9), 1107; **https://doi.org/10.3390/antibiotics10091107 (https://doi.org/10.3390/antibiotics10091107)** - 13 Sep 2021

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Abstract Multi-drug-resistant (MDR) organisms pose a global threat to modern medicine, which has grown as a result of irrational antibiotic use and misuse. This study aimed to assess general public knowledge in Jordan and awareness of antibiotics and antibiotic resistance during the COVID-19 pandemic. **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Use, Resistance and Stewardship (/journal/antibiotics/special_issues/Anti_Stew)**)

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Open Access Review (/2079-6382/10/9/1106/pdf?version=1631597599)

Photodynamic Therapy in Endodontics: A Helpful Tool to Combat Antibiotic Resistance? A Literature Review (/2079-6382/10/9/1106)

by **Haitham Abdelkarim-Elafifi (https://sciprofiles.com/profile/author/NDBGdnFpbkwxUGd3TWRzdzdhNnE2ZFZVNDNMall5ZFBMVXFKd254cVZLT**, **Isabel Parada-Avendaño (https://sciprofiles.com/profile/author/QVFJVXl2RldRbUNwcVdyNHN0cWZlVTBJcDk5WmZHeHBZdUhuaW9wS1RvTT** and **Josep Arnabat-Dominguez (https://sciprofiles.com/profile/541793)**

Antibiotics **2021**, *10*(9), 1106; **https://doi.org/10.3390/antibiotics10091106 (https://doi.org/10.3390/antibiotics10091106)** - 13 Sep 2021

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Abstract Background: Antibiotic resistance has become a growing global problem where overprescription is a contributing factor for its development. In the endodontics field, complementary treatments, such as antimicrobial photodynamic therapy (aPDT), have been described to eliminate residual bacteria from the root canal space and **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Resistance in Oral Microorganism (/journal/antibiotics/special_issues/anti_oral)**)

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Comparative Effectiveness Study of Home-Based Interventions to Prevent CA-MRSA Infection Recurrence (/2079-6382/10/9/1105)

by **Jonathan N. Tobin (https://sciprofiles.com/profile/1753663)**, **Suzanne Hower (https://sciprofiles.com/profile/author/K3dqL2ZGSSsyNGtFSll0aVhtdGg0T0tNZkJpcmprb3R2V1JpRHZhdVNkVT0=)**, **Brianna M. D'Orazio (https://sciprofiles.com/profile/author/M0RBdTNxVkl5Zm4rRTJUNG8rUVJqREJGbjMwVjFMSUlVdVJMN1JybnJQMD0=)**, **María Pardos de la Gándara (https://sciprofiles.com/profile/1798277)**, **Teresa H. Evering (https://sciprofiles.com/profile/1793805)**, **Chamanara Khalida (https://sciprofiles.com/profile/author/SHZDVS9lZXJ6Uml5S2VjQTZsci9rOHcwcUJJYk1QdTRtZE5oaG5OTmRPcz0=)**, **Jessica Ramachandran (https://sciprofiles.com/profile/author/Q04rTEJ0d1FRdzlLUnlyU3N3enMreXgyTkJQeURHL1laRktqSUpwK1FHRT0=)**, **Leidy Johana González (https://sciprofiles.com/profile/author/THBoczJyRjd2OFdvT3B0QzQ2SEpFS1Y3UkRpTFFhUzhlbGZnTkgzNE95ND0=)**, **Rhonda G. Kost (https://sciprofiles.com/profile/author/ano0cDR2WXJJdzlsbEJWeFg3ZS9FSTViTE5JVFYyUHV1RmRQY3RpUDRlWT0=)**, **Kimberly S. Vasquez (https://sciprofiles.com/profile/author/S3BNTGhodnF0KzNySmJZeUFuYjkwNnk0c1BGK3NORjB2WlRNY2p4K3BDQT0=)**, **Hermínia de Lencastre (https://sciprofiles.com/profile/author/T3VpbDdLbHRmeks5WGFVN1hMSWh4RDhBeGtvN0dpTmh4RGh4S3A5M1E4ND**, **Alexander Tomasz (https://sciprofiles.com/profile/author/QnNGRFBzTWJBTDRXemVYZ3dPRlU3eG9ZNnBSMmczUDFoV0JoNEh5N215OVBpeE**, **Barry S. Coller (https://sciprofiles.com/profile/author/TWYyQ3NTaS9ZYkl1Uk1tdzZYRWxOZXZENWE2cTlkQzNYRmk1dng4OWVDQT0=)** and **Roger Vaughan (https://sciprofiles.com/profile/author/VldhdmtucFVzS2xRUzBWdTFZZ2dvZ05kSUdsUXVwQW95OHRkSmc4dk0rND0=)**

Antibiotics **2021**, *10*(9), 1105; **https://doi.org/10.3390/antibiotics10091105 (https://doi.org/10.3390/antibiotics10091105)** - 13 Sep 2021

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Abstract Recurrent skin and soft tissue infections (SSTI) caused by Community-Associated Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA) or Methicillin-Sensitive *Staphylococcus aureus* (CA-MSSA) present treatment challenges. This community-based trial examined the effectiveness of an evidence-based intervention (CDC Guidelines, topical decolonization, surface decontamination) to reduce SSTI recurrence, mitigate **[...] Read more.**

(This article belongs to the Special Issue **A Themed Issue in Honor of Professor Alexander Tomasz—Outstanding Contributions in the Fields of Antibiotic Resistance and Bacterial Infectious Diseases (/journal/antibiotics/special_issues/Outstanding_Antibiotic)**)

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Open Access Review (/2079-6382/10/9/1104/pdf?version=1631529619)

Antibiotics in Necrotizing Soft Tissue Infections (/2079-6382/10/9/1104)

by **Tomas Urbina (https://sciprofiles.com/profile/1803876)**, **Keyvan Razazi (https://sciprofiles.com/profile/1277343)**, **Clément Ourghanlian (https://sciprofiles.com/profile/1808844)**, **Paul-Louis Woerther (https://sciprofiles.com/profile/author/ODJCZ0ZFS2VhbkdpZ3ZTbHhXN0F4YXAzdlcvSDlHejZFaXR6NWhjbE83bz0=)**, **Olivier Chosidow (https://sciprofiles.com/profile/1572241)**, **Raphaël Lepeule (https://sciprofiles.com/profile/1491396)** and **Nicolas de Prost (https://sciprofiles.com/profile/1781974)**

Antibiotics **2021**, *10*(9), 1104; **https://doi.org/10.3390/antibiotics10091104 (https://doi.org/10.3390/antibiotics10091104)** - 13 Sep 2021

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Abstract Necrotizing soft tissue infections (NSTIs) are rare life-threatening bacterial infections characterized by an extensive necrosis of skin and subcutaneous tissues. Initial urgent management of NSTIs relies on broad-spectrum antibiotic therapy, rapid surgical debridement of all infected tissues and, when present, treatment of associated **[...] Read more.**
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Open Access Review (/2079-6382/10/9/1103/pdf?version=1631525098)

Antibiotics, Multidrug-Resistant Bacteria, and Antibiotic Resistance Genes: Indicators of Contamination in Mangroves? (/2079-6382/10/9/1103)

by **Oskar A. Palacios (https://sciprofiles.com/profile/1839987)**, **Jaime Raúl Adame-Gallegos (https://sciprofiles.com/profile/2128668)**, **Blanca Estela Rivera-Chavira (https://sciprofiles.com/profile/242583)** and **Guadalupe Virginia Nevarez-Moorillon (https://sciprofiles.com/profile/14142)**

Antibiotics **2021**, *10*(9), 1103; **https://doi.org/10.3390/antibiotics10091103 (https://doi.org/10.3390/antibiotics10091103)** - 13 Sep 2021
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Abstract Multidrug-resistant bacteria and antibiotic resistance genes can be monitored as indicators of contamination in several environments. Mangroves are among the most productive ecosystems, and although they can be resilient to the action of climate phenomena, their equilibrium can be affected by anthropogenic activities. **[...] Read more.**
(This article belongs to the Special Issue **Antibiotics and Antibiotic Resistance in Aquatic Environments (/journal/antibiotics/special_issues/Aquatic_Environments)**)

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Open Access Article (/2079-6382/10/9/1102/pdf?version=1631517524)

Iso-Partricin, an Aromatic Analogue of Amphotericin B: How Shining Light on Old Drugs Might Help Create New Ones (/2079-6382/10/9/1102)

by **Paweł Szczeblewski (https://sciprofiles.com/profile/author/aWlFcms1TFRQQUl0SCttd0doUDZmcHdYQm1MVEhCYm1TTERxR0w1dEtGVT0=)**, **Justyna Górska (https://sciprofiles.com/profile/author/NFFWcHB3Z1ZjUDQyVEpZRGc5bWRheEh1MklTQTZoYlVIUENGekl0b2hSYz0=)**, **Witold Andrałojć (https://sciprofiles.com/profile/author/N0V2QnBWR3JFcVRCZkY0dXNyNVQwTCsyQVVwZFViL0VBTTBNaDdYN28rcz0=)**, **Patryk Janke (https://sciprofiles.com/profile/1774649)**, **Karolina Wąsik (https://sciprofiles.com/profile/author/TVdkRWJGNkJUb3NmZjRZZk4zbkRwQ3l1bm1ySWNrRGZjSDRsSmpMakNtUT0=)** and **Tomasz Laskowski (https://sciprofiles.com/profile/1738801)**

Antibiotics **2021**, *10*(9), 1102; **https://doi.org/10.3390/antibiotics10091102 (https://doi.org/10.3390/antibiotics10091102)** - 13 Sep 2021
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Abstract Partricin is a heptaene macrolide antibiotic complex that exhibits exceptional antifungal activity, yet poor selective toxicity, in the pathogen/host system. It consists of two compounds, namely partricin A and B, and both of these molecules incorporate two *cis*-type bonds within their heptaenic **[...] Read more.**
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Open Access Article (/2079-6382/10/9/1101/pdf?version=1631358657)

***Saccharomyces Cerevisiae* Var *Boulardii* CNCM I–1079 Reduces Expression of Genes Involved in Inflammatory Response in Porcine Cells Challenged by Enterotoxigenic *E. Coli* and Influences Bacterial Communities in an In Vitro Model of the Weaning Piglet Colon (/2079-6382/10/9/1101)**

by **Raphaële Gresse (https://sciprofiles.com/profile/author/NVhwM0IzMDYvQjhzOUlaS05VNDlvd1VjeU1hMUw0QzVtdW1DWTQ5eDNHST0=)**, **Juan J. Garrido (https://sciprofiles.com/profile/author/Rlh3UDFKOVdYM1ZXMjg5bGc0dmFpdz09)**, **Angeles Jiménez-Marín (https://sciprofiles.com/profile/author/dGVPdm5BNm9hdVhKQ2JGdmNNQVMyUT09)**, **Sylvain Denis (https://sciprofiles.com/profile/author/eUhrTnhab3lIZzBPVlltdExyb1d6b1hZWnJzMERMY29xT1l0VElrUFdlcz0=)**, **Tom Van de Wiele (https://sciprofiles.com/profile/1477893)**, **Evelyne Forano (https://sciprofiles.com/profile/802353)**, **Stéphanie Blanquet-Diot (https://sciprofiles.com/profile/530243)** and **Frédérique Chaucheyras-Durand (https://sciprofiles.com/profile/894000)**

Antibiotics **2021**, *10*(9), 1101; **https://doi.org/10.3390/antibiotics10091101 (https://doi.org/10.3390/antibiotics10091101)** - 11 Sep 2021
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Abstract Enterotoxigenic *Escherichia coli* (ETEC) is the main infectious agent responsible for piglet post-weaning diarrhea with high mortality rates. Antimicrobials represent the current principal strategy for treating ETEC infections in pig farms, but the occurrence of multi-resistant bacterial strains has considerably increased in the **[...] Read more.**

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Tracing Antibiotic Resistance Genes along the Irrigation Water Chain to Chive: Does Tap or Surface Water Make a Difference? (/2079-6382/10/9/1100)

by **Maria-Theresia Gekenidis (https://sciprofiles.com/profile/1248670)**, **Fiona Walsh (https://sciprofiles.com/profile/985261)** and **David Drissner (https://sciprofiles.com/profile/1110762)**

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Abstract Irrigation water is well known as potential source of pathogens in fresh produce. However, its role in transferring antibiotic resistance determinants is less well investigated. Therefore, we analyzed the contribution of surface and tap water to the resistome of overhead-irrigated chive plants. Field-grown **[...] Read more.**
(This article belongs to the Special Issue **Tracing Back Multidrug-Resistant Bacteria in Fresh Produce Production (/journal/antibiotics/special_issues/tracing_production)**)

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The Prevalence and Characterization of Fecal Extended-Spectrum-Beta-Lactamase-Producing *Escherichia coli* Isolated from Pigs on Farms of Different Sizes in Latvia (/2079-6382/10/9/1099)

by **Daiga Gāliņa (https://sciprofiles.com/profile/1777160)**, **Andris Balins (https://sciprofiles.com/profile/author/NTQyMHkvanZkUk54S1VnQTR2VmJOdU10cFhEUHk4TG5rT2RmSW9iSTE1az0=)** and **Anda Valdovska (https://sciprofiles.com/profile/1567542)**

Antibiotics **2021**, *10*(9), 1099; **https://doi.org/10.3390/antibiotics10091099 (https://doi.org/10.3390/antibiotics10091099)** - 11 Sep 2021
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Abstract The aim of this study was to determine the prevalence of fecal ESBL-producing *Escherichia coli* (*E. coli*) in pigs on large and small farms in Latvia, to characterize beta-lactamase genes and establish an antimicrobial resistance profile. Fecal samples (n = 615) **[...] Read more.**

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Open Access Article (/2079-6382/10/9/1098/pdf?version=1631607746)

Urinary Tract Infections in Elderly Patients: A 10-Year Study on Their Epidemiology and Antibiotic Resistance Based on the WHO Access, Watch, Reserve (AWaRe) Classification (/2079-6382/10/9/1098)

by **Márió Gajdács (https://sciprofiles.com/profile/317381)**, **Marianna Ábrók (https://sciprofiles.com/profile/author/KzJGakhUNWhLTmgreE9OQVFNajhSb0VSdlIJcFkzZU83Tk9xV3ZiYXQvbz0=)**, **Andrea Lázár (https://sciprofiles.com/profile/author/R0ovazFjNGpkTXlVK1hUcFhURUJMMjl1Zm9KSVg2YTY1MEZoTkt1cExjTT0=)** and **Katalin Burián (https://sciprofiles.com/profile/939975)**

Antibiotics **2021**, *10*(9), 1098; **https://doi.org/10.3390/antibiotics10091098 (https://doi.org/10.3390/antibiotics10091098)** - 11 Sep 2021
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Abstract The ageing of the population—especially in developed countries—has brought on many societal challenges and has significantly contributed to the burden on healthcare infrastructures worldwide. Elderly persons (aged ≥ 65 years) are at higher risk for developing UTIs, due to a range of intrinsic **[...] Read more.**
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Activation of Cryptic Antibiotic Biosynthetic Gene Clusters Guided by RNA-seq Data from Both *Streptomyces ansochromogenes* and ΔwblA (/2079-6382/10/9/1097)

by Yue Li (https://sciprofiles.com/profile/author/ZmNwMm5nTHJvUG1NdGVjVFlsWDQ5QT09), Haiying Yu (https://sciprofiles.com/profile/author/NGZKQjZiR2dwMVl4Q25yNmZuMnhDK0JaS3hKWE9saWQ0VEptcjRPVDBJYz0=), Hanye Guan (https://sciprofiles.com/profile/author/NW0va1NsZ2oxVC9Va2F0Vmt6a28rQT09), Jingjing Li (https://sciprofiles.com/profile/author/UXcvTzQ4emRZa0lzL2REdnRtS1NmcTJvaUcvNnBJL1ltakRKeHBqZVVWZz0=), Jihui Zhang (https://sciprofiles.com/profile/523469), Hua Xiang (https://sciprofiles.com/profile/1891670), Jine Li (https://sciprofiles.com/profile/1743495) and Huarong Tan (https://sciprofiles.com/profile/1736238)

Antibiotics **2021**, *10*(9), 1097; https://doi.org/10.3390/antibiotics10091097 (https://doi.org/10.3390/antibiotics10091097) - 10 Sep 2021
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Abstract With the increase of drug resistance caused by the improper use and abuse of antibiotics, human beings are facing a global health crisis. Sequencing of *Streptomyces* genomes revealed the presence of an important reservoir of secondary metabolic gene clusters for previously unsuspected products **[...] Read more.**

(This article belongs to the Special Issue **Discovery and Biosynthesis of Novel Antibiotic from *Streptomyces* (/journal/antibiotics/special_issues/Streptomyces_Antibiotic)**)

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Comparison of Pharmaceutical Characteristics between Brand-Name Meropenem and Its Generics (/2079-6382/10/9/1096)

by Ping Yang (https://sciprofiles.com/profile/1633512), Shigeru Fujimura (https://sciprofiles.com/profile/1659076), Yawei Du (https://sciprofiles.com/profile/author/ak5YcU45Q2k4cEpjRVZRczJIZ0VhcDB6a1lmM3JvRnFBd1FlS2ozT1RjMD0=), Bei Zhang (https://sciprofiles.com/profile/author/bXNXaGVwaWUrMVdhNTF0NDRTVHRSQTMxMytkVjZ2cjZoS3Y4UzhseWdGUT0=), Li Yang (https://sciprofiles.com/profile/1800383), Masato Kawamura (https://sciprofiles.com/profile/author/SjlzNVJCbFF1STlkOVNMYkFmU1NsemR0UGNyY2lHR2xFeis0ZGlHSndhVT0=), Zhenhua Zhang (https://sciprofiles.com/profile/author/K3ZlVG80RWhGV2NUTzY2bHZ3bkpGajdhMnRZRmJVYlVaSmZ5MC95TC9BYz0=) and Suodi Zhai (https://sciprofiles.com/profile/747477)

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Abstract This study aimed to provide comparative information of pharmaceutical properties, including particle morphology and distribution uniformity, solubility, presence of residual solvent and insoluble particles, and antimicrobial activities, between brand-name meropenem (Mepem®, BNM) and its six generic products (GPs A-F) marketed in **[...] Read more.**

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Open Access Review (/2079-6382/10/9/1095/pdf?version=1631684384)

Antimicrobial Peptides: A Potent Alternative to Antibiotics (/2079-6382/10/9/1095)

by Mariam Rima (https://sciprofiles.com/profile/1786502), Mohamad Rima (https://sciprofiles.com/profile/523451), Ziad Fajloun (https://sciprofiles.com/profile/176124), Jean-Marc Sabatier (https://sciprofiles.com/profile/11509), Burkhard Bechinger (https://sciprofiles.com/profile/414116) and Thierry Naas (https://sciprofiles.com/profile/897150)

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Cited by 56 (/2079-6382/10/9/1095#metrics) | Viewed by 7529

Abstract Antimicrobial peptides constitute one of the most promising alternatives to antibiotics since they could be used to treat bacterial infections, especially those caused by multidrug-resistant pathogens. Many antimicrobial peptides, with various activity spectra and mechanisms of actions, have been described. This review focuses **[...] Read more.**

(This article belongs to the Special Issue **10th Anniversary of Antibiotics–Recent Advances in Antimicrobial Peptides (/journal/antibiotics/special_issues/anti-peptides_antibiotics)**)

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Open Access Review (/2079-6382/10/9/1094/pdf?version=1631255055)

Antimicrobial Peptides and Their Applications in Biomedical Sector (/2079-6382/10/9/1094)

by Afreen Sultana (https://sciprofiles.com/profile/1681930), Hongrong Luo (https://sciprofiles.com/profile/1638479) and Seeram Ramakrishna (https://sciprofiles.com/profile/148492)

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Abstract In a report by WHO (2014), it was stated that antimicrobial resistance is an arising challenge that needs to be resolved. This resistance is a critical issue in terms of disease or infection treatment and is usually caused due to mutation, gene transfer, **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Activity of Medical Materials (/journal/antibiotics/special_issues/Medical_Materials)**)

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High Serum Levels of Toxin A Correlate with Disease Severity in Patients with *Clostridioides difficile* Infection (/2079-6382/10/9/1093)

by Guido Granata (https://sciprofiles.com/profile/1149498), Davide Mariotti (https://sciprofiles.com/profile/1737841), Paolo Ascenzi (https://sciprofiles.com/profile/2252382), Nicola Petrosillo (https://sciprofiles.com/profile/163137) and Alessandra di Masi (https://sciprofiles.com/profile/125364)

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Abstract *Cloistridioides difficile* (CD) represents a major public healthcare-associated infection causing significant morbidity and mortality. The pathogenic effects of CD are mainly caused by the release of two exotoxins into the intestine: toxin A (TcdA) and toxin B (TcdB). CD infection (CDI) can also **[...] Read more.**

(This article belongs to the Special Issue ***Clostridioides difficile* Infection (/journal/antibiotics/special_issues/clostri_difficile)**)

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Open Access Article (/2079-6382/10/9/1092/pdf?version=1631266455)

Growth Suppression of a Gingivitis and Skin Pathogen *Cutibacterium* (*Propionibacterium*) *acnes* by Medicinal Plant Extracts (/2079-6382/10/9/1092)

by Hyoung-An Choi (https://sciprofiles.com/profile/author/T3psdmU1aTVKLy9QUEV6MmNrRVNVUmNTZ211MXdlampqQVgrRFhTNFZhRT0=), Sang-Oh Ahn (https://sciprofiles.com/profile/1640075), Ho-Dong Lim (https://sciprofiles.com/profile/author/VVBNSVJmb0JwVDJxZzZaaUNBRE9BQmxleWJGNGRwUVVOVml2dE1kMjJROD0=) and Geun-Joong Kim (https://sciprofiles.com/profile/556792)

Antibiotics **2021**, *10*(9), 1092; https://doi.org/10.3390/antibiotics10091092 (https://doi.org/10.3390/antibiotics10091092) - 09 Sep 2021
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Abstract *Propionibacterium acnes*, newly reclassified as *Cutibacterium acnes*, is an anaerobic Gram-positive bacterium causing acne, found mainly on the skin. In addition, *P. acnes* is responsible for inflammation of the gums (gingivitis) and blood vessels, consequently leading to various diseases in the **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Activity of Extracts from Plant (/journal/antibiotics/special_issues/antimicrobial_anti_plant)**)

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The Internet: Friend or Foe of Antibiotic Resistance? Results of a Cross-Sectional Study among Italian University Students (/2079-6382/10/9/1091)

by Francesca Licata (https://sciprofiles.com/profile/1402696), Silvia Angelillo (https://sciprofiles.com/profile/1754759), Alessandra Oliverio (https://sciprofiles.com/profile/1754745) and Aida Bianco (https://sciprofiles.com/profile/1352987)

Antibiotics **2021**, *10*(9), 1091; https://doi.org/10.3390/antibiotics10091091 (https://doi.org/10.3390/antibiotics10091091) - 09 Sep 2021
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Abstract The study aims were to investigate knowledge and attitudes towards antibiotics and antibiotic resistance (ABR), and to assess the extent of practices regarding antibiotic consumption and Internet use among university students in Southern Italy. Data were collected through an anonymous online questionnaire from **[...] Read more.**

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Antimicrobial Activity and Composition of Five *Rosmarinus* (Now *Salvia* spp. and Varieties) Essential Oils (/2079-6382/10/9/1090)

by **Ylenia Pieracci (https://sciprofiles.com/profile/1506484)**, **Daniela Ciccarelli (https://sciprofiles.com/profile/author/djU0WDIxWWc3alREQVRLcFM1RWZMcG5RR3dDb1FCbktUYmN1TWx0b0QyWT0=)**, **Silvia Giovanelli (https://sciprofiles.com/profile/author/K2ZUR1ArZmtLSkZLd2NoczI6dmZvY0JzK0FzRG9pSFFKbUQ1QXFPSTdOND0=)**, **Luisa Pistelli (https://sciprofiles.com/profile/762235)**, **Guido Flamini (https://sciprofiles.com/profile/219776)**, **Claudio Cervelli (https://sciprofiles.com/profile/1176882)**, **Francesca Mancianti (https://sciprofiles.com/profile/542625)**, **Simona Nardoni (https://sciprofiles.com/profile/407853)**, **Fabrizio Bertelloni (https://sciprofiles.com/profile/790957)** and **Valentina Virginia Ebani (https://sciprofiles.com/profile/249556)**

Antibiotics **2021**, *10*(9), 1090; **https://doi.org/10.3390/antibiotics10091090 (https://doi.org/10.3390/antibiotics10091090)** - 09 Sep 2021

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Abstract *Salvia rosmarinus* Spenn. and *Salvia jordanii* J.B.Walker are aromatic evergreen shrubs belonging to the Lamiaceae family. Their aerial parts have been used since ancient times as natural preservatives. The present study reported the investigation of the chemical profile and the extraction yield of **[...] Read more.**

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A Combined Phenotypic-Genotypic Predictive Algorithm for In Vitro Detection of Bicarbonate: β-Lactam Sensitization among Methicillin-Resistant *Staphylococcus aureus* (MRSA) (/2079-6382/10/9/1089)

by **Selvi C. Ersoy (https://sciprofiles.com/profile/1730317)**, **Warren E. Rose (https://sciprofiles.com/profile/769570)**, **Robin Patel (https://sciprofiles.com/profile/563310)**, **Richard A. Proctor (https://sciprofiles.com/profile/author/b2FiZXpxZ0FKV1o2VE96cHhDaXArdz09)**, **Henry F. Chambers (https://sciprofiles.com/profile/author/MHZRbmJuaXZsZUxncDRzWXdEaU93UWJtMCtRWlpyZGFBNlJoTXlDMEFsST0=)**, **Ewan M. Harrison (https://sciprofiles.com/profile/author/d0QvR0NmS1IrZjVybFpkUnZaSTBNN0NERTZabkVJUVRSdWlYWnVEMnJqND0=)**, **Youngju Pak (https://sciprofiles.com/profile/author/azQvRXMxd1RwMFpPdW9NYU52NkV1U0FhUDRUNk52blo2QVBRTW9jZk0xND0=)** and **Arnold S. Bayer (https://sciprofiles.com/profile/1535601)**

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Abstract Antimicrobial susceptibility testing (AST) is routinely used to establish predictive antibiotic resistance metrics to guide the treatment of bacterial pathogens. Recently, a novel phenotype termed “bicarbonate ($NaHCO_3$)-responsiveness” was identified in a relatively high frequency of clinical MRSA strains, wherein isolates demonstrate **[...] Read more.**

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Open Access Review (/2079-6382/10/9/1088/pdf?version=1631178269)

Extended or Continuous Infusion of Carbapenems in Children with Severe Infections: A Systematic Review and Narrative Synthesis (/2079-6382/10/9/1088)

by **Pengxiang Zhou (https://sciprofiles.com/profile/1483642)**, **Yahui Zhang (https://sciprofiles.com/profile/author/d0l0aWpGMWxGcTdQSXZQWEtwaGxkZVhvN1VJWmM4V2dsdmFSNy9abVZ0WT0=)**, **Zhenhuan Wang (https://sciprofiles.com/profile/author/UVRtRXp6NSsrbnVyQ2RaYnJlNW5SQT09)**, **Yingqiu Ying (https://sciprofiles.com/profile/author/amczazRlelo4S0x4ejFmTGJvOThzbHdSWHoyT2JkM3JXb1ppZDBzak5OOD0=)**, **Yan Xing (https://sciprofiles.com/profile/2036934)**, **Xiaomei Tong (https://sciprofiles.com/profile/2036933)** and **Suodi Zhai (https://sciprofiles.com/profile/747477)**

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Abstract We systematically reviewed the efficacy and safety of an extended or continuous infusion (EI/CI) versus short-term infusion (STI) of carbapenems in children with severe infections. Databases, including PubMed, Embase, the Cochrane Library, Clinicaltrials.gov, China National Knowledge Infrastructure, WanFang Data, and SinoMed, were systematically **[...] Read more.**

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Does Vancomycin Wrapping in Anterior Cruciate Ligament Reconstruction Affect Tenocyte Activity In Vitro? (/2079-6382/10/9/1087)

by **Rocco Papalia (https://sciprofiles.com/profile/876374)**, **Claudia Cicione (https://sciprofiles.com/profile/1102033)**, **Fabrizio Russo (https://sciprofiles.com/profile/988939)**, **Luca Ambrosio (https://sciprofiles.com/profile/1076107)**, **Giuseppina Di Giacomo (https://sciprofiles.com/profile/1102068)**, **Gianluca Vadalà (https://sciprofiles.com/profile/1036180)** and **Vincenzo Denaro (https://sciprofiles.com/profile/876375)**

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Abstract Knee septic arthritis is a devastating complication following anterior cruciate ligament (ACL) reconstruction. To prevent this issue, intraoperative soaking of ACL grafts with vancomycin is often performed before implantation. Although vancomycin cytotoxicity has been reported several times, little is known about its biological **[...] Read more.**

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Open Access Review (/2079-6382/10/9/1086/pdf?version=1631095280)

The Potential of Probiotics to Eradicate Gut Carriage of Pathogenic or Antimicrobial-Resistant *Enterobacterales* (/2079-6382/10/9/1086)

by **Yuan-Pin Hung (https://sciprofiles.com/profile/1549470)**, **Ching-Chi Lee (https://sciprofiles.com/profile/617413)**, **Jen-Chieh Lee (https://sciprofiles.com/profile/author/bWY2VDB2bnJEQ1dPdTgzU1IiQlUvVi8veUI4MkZ2Wk9SRTFJZ1ZXeTN5Yz0=)**, **Pei-Jane Tsai (https://sciprofiles.com/profile/1909454)**, **Po-Ren Hsueh (https://sciprofiles.com/profile/1722577)** and **Wen-Chien Ko (https://sciprofiles.com/profile/611432)**

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Abstract Probiotic supplements have been used to decrease the gut carriage of antimicrobial-resistant *Enterobacterales* through changes in the microbiota and metabolomes, nutrition competition, and the secretion of antimicrobial proteins. Many probiotics have shown *Enterobacterales*-inhibiting effects ex vivo and in vivo. In livestock, probiotics **[...] Read more.**

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Phages for Africa: The Potential Benefit and Challenges of Phage Therapy for the Livestock Sector in Sub-Saharan Africa (/2079-6382/10/9/1085)

by **Angela Makumi (https://sciprofiles.com/profile/1684619)**, **Amos Lucky Mhone (https://sciprofiles.com/profile/2372732)**, **Josiah Odaba (https://sciprofiles.com/profile/author/ZmZUNEJUU0EwamNUQ2s2Y1pyM0owdkZZNjlBNTI3bHdVQ3pUd3U5c2Vkdz0=)**, **Linda Guantai (https://sciprofiles.com/profile/author/RnlidWVURW1idFk0czcrWHJXQmpUcTdYd3ZKVlhRMkxwT2pYcnpGSVJUTT0=)** and **Nicholas Svitek (https://sciprofiles.com/profile/1708086)**

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Abstract One of the world’s fastest-growing human populations is in Sub-Saharan Africa (SSA), accounting for more than 950 million people, which is approximately 13% of the global population. Livestock farming is vital to SSA as a source of food supply, employment, and income. With **[...] Read more.**

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Microwave-Assisted, One-Pot Synthesis of Doxycycline under Heterogeneous Catalysis in Water (/2079-6382/10/9/1084)

by **Fabio Bucciol (https://sciprofiles.com/profile/1795442)**, **Elia Maffeis (https://sciprofiles.com/profile/1758831)**, **Emanuela Calcio Gaudino (https://sciprofiles.com/profile/237035)**, **László Jicsinszky (https://sciprofiles.com/profile/237053)**, **Silvia Tagliapietra (https://sciprofiles.com/profile/2360632)**, **Alessandro Barge (https://sciprofiles.com/profile/1098737)**, **Cristina Prandi (https://sciprofiles.com/profile/39729)** and **Giancarlo Cravotto (https://sciprofiles.com/profile/327356)**

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Abstract The selective synthesis of active pharmaceutical molecules is a challenging issue, particularly when attempting to make the reactions even more sustainable. The present work focuses on the microwave-assisted hydrogenolysis of oxytetracycline to selectively produce α-doxycycline. Although the combination of microwave irradiation and a **[...] Read more.**

(This article belongs to the Topic **Compounds with Medicinal Value (/topics/Compounds_Medicinal_Value)**)

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Editorial: *Antibiotics* Special Issue on the Use of Antibiotics in Primary Care (/2079-6382/10/9/1083)

by **Gloria Cordoba (https://sciprofiles.com/profile/320979)**

Antibiotics **2021**, *10*(9), 1083; **https://doi.org/10.3390/antibiotics10091083 (https://doi.org/10.3390/antibiotics10091083)** - 08 Sep 2021

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Abstract For many decades, the importance of increasing knowledge on the rational use of antibiotics has not been given the priority it deserves [...] **Full article (/2079-6382/10/9/1083)**

(This article belongs to the Special Issue **Antibiotics Use in Primary Care (/journal/antibiotics/special_issues/anti_use_care)**)

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Biofilm Producing *Enterococcus* Isolates from Vaginal Microbiota (/2079-6382/10/9/1082)

by **Mallika Sengupta (https://sciprofiles.com/profile/1100634)**, **Soma Sarkar (https://sciprofiles.com/profile/1857576)**, **Manideepa SenGupta (https://sciprofiles.com/profile/410851)**, **Sougata Ghosh (https://sciprofiles.com/profile/author/L2Vqa0pwZks2VXc5dHYrcWNiVHd2YTBJTjFHU21FcGsxdDU1SVppN0xmVT0=)**, **Riya Sarkar (https://sciprofiles.com/profile/1792156)** and **Parthajit Banerjee (https://sciprofiles.com/profile/author/MXl3T0NRZ0VucElWRi9FT1RZbGdqWVZJdXVFMkFxRWRBaW1ab200VENtTT0=)**

Antibiotics **2021**, *10*(9), 1082; **https://doi.org/10.3390/antibiotics10091082 (https://doi.org/10.3390/antibiotics10091082)** - 07 Sep 2021

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Abstract Background: *Enterococcus* is an important cause of infection in the hospital as well as in the community. Methods: A prospective study was done in Medical College, Kolkata for a period of 2 years (from January 2018 to December 2019). After obtaining clearance from **[...] Read more.**

(This article belongs to the Special Issue **Biofilm-Associated Vaginal Infections (/journal/antibiotics/special_issues/Vaginal_Infections)**)

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Efficacies of Colistin–Carbapenem versus Colistin–Tigecycline in Critically Ill Patients with CR-GNB-Associated Pneumonia: A Multicenter Observational Study (/2079-6382/10/9/1081)

by **Sheng-Huei Wang (https://sciprofiles.com/profile/1779999)**, **Kuang-Yao Yang (https://sciprofiles.com/profile/549134)**, **Chau-Chyun Sheu (https://sciprofiles.com/profile/385660)**, **Wei-Cheng Chen (https://sciprofiles.com/profile/1495366)**, **Ming-Cheng Chan (https://sciprofiles.com/profile/author/VUdyRlg2V3U0enRVVXM5ejNadTlIUkJxOS9tMUQ2ZXJSaTRGQ3k2VkVoOD0=)**, **Jia-Yih Feng (https://sciprofiles.com/profile/891416)**, **Chia-Min Chen (https://sciprofiles.com/profile/author/Uk5wUENaOFJWcU9lUFdLUkJ5Z0xrSUpLT0hUa3RWUFoxZnVTODVDYUwvaz0=)**, **Biing-Ru Wu (https://sciprofiles.com/profile/2675449)**, **Zhe-Rong Zheng (https://sciprofiles.com/profile/author/UktSYmtqakFwd0l4Z3dkbUlqWjN5cHlBZmN4ZEI2TEwzWXVLOTExaUtPRT0=)**, **Yu-Ching Chou (https://sciprofiles.com/profile/773870)**, **Chung-Kan Peng (https://sciprofiles.com/profile/831459)** and **on behalf of the T-CARE (Taiwan Critical Care Infection) Group (/search?authors=on%20behalf%20of%20the%20T-CARE%20%28Taiwan%20Critical%20Care%20Infection%29%20Group&orcid=)**

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Abstract Background: Evaluating the options for antibiotic treatment for carbapenem-resistant Gram-negative bacteria (CR-GNB)-associated pneumonia remains crucial. We compared the therapeutic efficacy and nephrotoxicity of two combination therapies, namely, colistin + carbapenem (CC) versus colistin + tigecycline (CT), for treating CR-GNB-related nosocomial pneumonia in critically **[...] Read more.**

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High Prevalence of Antibiotic Resistance among Opportunistic Pathogens Isolated from Patients with COVID-19 under Mechanical Ventilation: Results of a Single-Center Study (/2079-6382/10/9/1080)

by **Chiara Temperoni (https://sciprofiles.com/profile/1740663)**, **Luca Caiazzo (https://sciprofiles.com/profile/author/NkFWMDlzMEZHYUxiM21RUFd4Vmh0bmVBOFpVS24xTDl0UEpTdmQ0OG9hOERiL0tjd3JF** and **Francesco Barchiesi (https://sciprofiles.com/profile/1761592)**

Antibiotics **2021**, *10*(9), 1080; **https://doi.org/10.3390/antibiotics10091080 (https://doi.org/10.3390/antibiotics10091080)** - 06 Sep 2021

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Abstract The effect of the COVID-19 pandemic on antibiotic resistance diffusion in healthcare settings has not been fully investigated. In this study we evaluated the prevalence of antibiotic resistance among opportunistic pathogens isolated from patients with COVID-19 under mechanical ventilation. An observational, retrospective, analysis **[...] Read more.**

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Open Access Review (/2079-6382/10/9/1079/pdf?version=1631066315)

Mucormycosis in Indian COVID-19 Patients: Insight into Its Patho-Genesis, Clinical Manifestation, and Management Strategies (/2079-6382/10/9/1079)

by **Ram Kumar Sahu (https://sciprofiles.com/profile/1675031)**, **Mounir M. Salem-Bekhit (https://sciprofiles.com/profile/1692626)**, **Bedanta Bhattacharjee (https://sciprofiles.com/profile/1686443)**, **Yosif Almoshari (https://sciprofiles.com/profile/1627846)**, **Abu Md Ashif Ikbal (https://sciprofiles.com/profile/1733033)**, **Meshal Alshamrani (https://sciprofiles.com/profile/1849985)**, **Alakesh Bharali (https://sciprofiles.com/profile/1766616)**, **Ahmad Salawi (https://sciprofiles.com/profile/1795077)**, **Retno Widyowati (https://sciprofiles.com/profile/1077499)**, **Abdulrahman Alshammari (https://sciprofiles.com/profile/1329726)** and **Ibrahim Elbagory (https://sciprofiles.com/profile/author/K2hlcUVwdVlnK2MxUCs2UjZkWEtWcmsxYTc0aTl6UEFCMzB5RWl2cHZvTT0=)**

Antibiotics **2021**, *10*(9), 1079; **https://doi.org/10.3390/antibiotics10091079 (https://doi.org/10.3390/antibiotics10091079)** - 06 Sep 2021

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Abstract Mucormycosis in patients who have COVID-19 or who are otherwise immunocompromised has become a global problem, causing significant morbidity and mortality. Infection is debilitating and fatal, leading to loss of organs and emotional trauma. Radiographic manifestations are not specific, but diagnosis can be **[...] Read more.**

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Effectiveness of an Electronic Automated Antibiotic Time Out Alert in the Setting of Gram-Negative Bacteremia (/2079-6382/10/9/1078)

by **Sana M. Mohayya (https://sciprofiles.com/profile/1693545)**, **Navaneeth Narayanan (https://sciprofiles.com/profile/author/VlhCK1N5YjV0blBZVkNtbWJQenFZYVZaVE0yNzY3RkpQNWRrTVJsTDhpdz0=)**, **Daniel Cimilluca (https://sciprofiles.com/profile/author/SmpTWG1JMWRYemhRcFNFTWEyTHlQaW1EckJveXdZcHJTeHJ5aEhESEJyND0=)**, **Alexander Malanowski (https://sciprofiles.com/profile/author/dlNJRC9DYU96RkhSK2F0T2duQWJQWVFocEREYThhNFVUOEVtWFd0U21SVT0=**, **Parth Vaidya (https://sciprofiles.com/profile/author/bkxzczRTQlpZOFpnZ0x5ajhrMkQrczczYnB4cDFPNUJrVXBWa1lpQVR0ND0=)** and **Tanaya Bhowmick (https://sciprofiles.com/profile/author/U0h5cTc0bnhTcDQzcE9YK0p5b3BUUEFsUlhFR1p1SFpBUnRnN2lwKzVwVT0=)**

Antibiotics **2021**, *10*(9), 1078; **https://doi.org/10.3390/antibiotics10091078 (https://doi.org/10.3390/antibiotics10091078)** - 06 Sep 2021

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Abstract To minimize complications associated with over-utilization of antibiotics, many antimicrobial stewardship programs have incorporated an antibiotic time out (ATO); however, limited data are available to support its effectiveness. This was a single-center retrospective cohort study assessing the impact of the automated electronic ATO **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Prescribing and Stewardship, 2nd Volume (/journal/antibiotics/special_issues/Stewardship_2nd)**)

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Cationic Polymer-Coated Magnetic Nanoparticles with Antibacterial Properties: Synthesis and In Vitro Characterization (/2079-6382/10/9/1077)

by **Anastasiia B. Shatan (https://sciprofiles.com/profile/author/dEl2akY1NFo1dm94VkN1ckVPRlNEZGZwQjNEOXNDQmdmR2JrVW1tRWNOST0=)**, **Vitalii Patsula (https://sciprofiles.com/profile/author/NXBaVUlPM3kvMVhsaXlQL3BxYlZoM1lzZExTYW9FeGtlVkJhSmh1NmRMRT0=)**, **Aneta Dydowiczová (https://sciprofiles.com/profile/author/QnllaWk0d2p2MG1ibS9vdmo4S3VWWERmNUdyS2dYbkVUeEVtaU16Tm94az0=)**, **Kristýna Gunár (https://sciprofiles.com/profile/author/RG9NSXdvK0NWVURFZFplNzZBTTFjVXUvbDZmVWRUR2t1Nzd2bStVUkhHdz0=)**, **Nadiia Velychkivska (https://sciprofiles.com/profile/author/QXBPYWE2aHNZTElweWh6cFR3b0RWZUE2aXV1dGJvcXo2aVZMbTBkUW5UZz0=)**, **Jiřina Hromádková (https://sciprofiles.com/profile/author/MnFjUytFQXlxWXJycytET281amZCd0F0UzV1bnMwczRmQVl1cUg1U1d4TT0=)**, **Eduard Petrovský (https://sciprofiles.com/profile/author/M0M2L3h0KzlFTUdnWjJFemJXK3pHQT09)** and **Daniel Horák (https://sciprofiles.com/profile/1363229)**

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Abstract Uniformly sized magnetite nanoparticles (D_n = 16 nm) were prepared by a thermal decomposition of Fe(III) oleate in octadec-1-ene and stabilized by oleic acid. The particles were coated with Sipomer PAM-200 containing both phosphate and methacrylic groups available for the attachment **[...] Read more.**

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Multifunctional Therapeutic Potential of Phytocomplexes and Natural Extracts for Antimicrobial Properties (/2079-6382/10/9/1076)

by **Md. Mominur Rahman (https://sciprofiles.com/profile/1877333)**, **Md. Saidur Rahaman (https://sciprofiles.com/profile/1775542)**, **Md. Rezaul Islam (https://sciprofiles.com/profile/author/Yml3QjFRaUNaRktseEltVmQ4TWVvV0J0Yy8wSEN4dktleGQ5aVlUOG9GND0=)**, **Md. Emon Hossain (https://sciprofiles.com/profile/author/bkxDRit1VS9Td2RPdHN2cDlwd2lRd1BNSmlxRFZmb1JtOXZJK3pMYXdCaz0=)**, **Faria Mannan Mithi (https://sciprofiles.com/profile/1772649)**, **Muniruddin Ahmed (https://sciprofiles.com/profile/author/WkF4R0dVSnhlOGFDamE4MUswSzdWaVBHUkM3VDNOV3hNM1MvblRlOW82MD0=)**, **Marianela Saldías (https://sciprofiles.com/profile/696976)**, **Esra Küpeli Akkol (https://sciprofiles.com/profile/654855)** and **Eduardo Sobarzo-Sánchez (https://sciprofiles.com/profile/1901)**

Antibiotics **2021**, *10*(9), 1076; **https://doi.org/10.3390/antibiotics10091076 (https://doi.org/10.3390/antibiotics10091076)** - 06 Sep 2021

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Abstract Natural products have been known for their antimicrobial factors since time immemorial. Infectious diseases are a worldwide burden that have been deteriorating because of the improvement of species impervious to various anti-infection agents. Hence, the distinguishing proof of antimicrobial specialists with high-power dynamic **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Properties of Phytocomplexes and Isolated Compounds** (/journal/antibiotics/special_issues/Phytocomplexes))

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Open Access Article (/2079-6382/10/9/1075/pdf?version=1630835686)

Efflux Pump Inhibition and Resistance Modulation in *Mycobacterium smegmatis* by *Peucedanum ostruthium* and Its Coumarins (/2079-6382/10/9/1075)

by **Katarina Šimunović (https://sciprofiles.com/profile/908672)**, **Julia Solnier (https://sciprofiles.com/profile/979855)**, **Fabian Alperth (https://sciprofiles.com/profile/author/MTlVR24wUzZaR0FiQ09vTUVwdWtrb1NpWWRkODFML1YzN29Jb2x4a2VsOD0=)**, **Olaf Kunert (https://sciprofiles.com/profile/1160514)**, **Sonja Smole Možina (https://sciprofiles.com/profile/923831)** and **Franz Bucar (https://sciprofiles.com/profile/25249)**

Antibiotics **2021**, *10*(9), 1075; **https://doi.org/10.3390/antibiotics10091075 (https://doi.org/10.3390/antibiotics10091075)** - 05 Sep 2021

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Abstract Antibiotic resistance is a growing problem and may become the next major global health crisis if no timely actions are taken. Mycobacterial infections are widespread and, due to antibiotic resistance, also hard to treat and a major cause of mortality. Natural compounds have **[...] Read more.**

(This article belongs to the Special Issue **The Role of Efflux Pump Inhibitor in Bacterial Multidrug Resistance** (/journal/antibiotics/special_issues/Bacterial_Multidrug_Resistance))

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Chemical Constituents and Biological Activities of *Croton heliotropiifolius* Kunth (/2079-6382/10/9/1074)

by **Priscilla Augusta de Sousa Fernandes (https://sciprofiles.com/profile/1761943)**, **Josefa Carolaine Pereira da Silva (https://sciprofiles.com/profile/author/Z1ZWT2RObzArS1E5RlV6MmsrYWtKZzJQYk5heEIwTG5vZmUwcUlMM**, **Débora Lima Sales (https://sciprofiles.com/profile/author/QTNpdTVjWVNDRG1idld4K3Z1OTJGTUNGbU93Nzh2YzJFSUdBZ0o1Q2t2bz0=)**, **Paulo Riceli Vasconcelos Ribeiro (https://sciprofiles.com/profile/737146)**, **Edy Sousa de Brito (https://sciprofiles.com/profile/103041)**, **Marta Regina Kerntopf (https://sciprofiles.com/profile/author/YTNmSGlMNG9Pa3hxQ2FUbkRHQ2FkMXNkTUNtanpoeXNUR1Q3SmN5TWlleS94**, **Gyllyandeson de Araújo Delmondes (https://sciprofiles.com/profile/2433310)**, **Jacqueline Cosmo Andrade Pinheiro (https://sciprofiles.com/profile/1938028)**, **Gerson Javier Torres Salazar (https://sciprofiles.com/profile/1840010)**, **Francisco Lucas Alves Batista (https://sciprofiles.com/profile/author/eU9RMWZ5d2YwWmx1a1RGZE90THgxYi9UYmw1OUN5OE9DWWlVTGpx**, **Francisco Ernani Alves Magalhães (https://sciprofiles.com/profile/author/bTdGNjk0ekJtRkl2eFYzR0F4d3lIU3Z3a2l4VXNEVmZmdUpoUWVzWn**, **Maria Celeste Vega Gomez (https://sciprofiles.com/profile/author/bGdHc0RYcUVPcjVQcGFaQ3h5VUdvVVBYNnFDMlg3blRyNVJWdy8yWWh1Z**, **Míriam Rolón (https://sciprofiles.com/profile/author/QTlZaTVGM1FRWVNsUEl0RW5hMkF4blhxdEhSV1VSaHVwRzQ1dzRNY3Y0ST0=)**, **Cathia Coronel (https://sciprofiles.com/profile/253565)**, **Jaime Ribeiro-Filho (https://sciprofiles.com/profile/99015)**, **José Weverton Almeida-Bezerra (https://sciprofiles.com/profile/918221)**, **Abolghasem Siyadatpanah (https://sciprofiles.com/profile/1188190)**, **Veeranoot Nissapatorn (https://sciprofiles.com/profile/1620514)**, **Maria de Lourdes Pereira (https://sciprofiles.com/profile/293355)**, **Henrique Douglas Melo Coutinho (https://sciprofiles.com/profile/1298311)** and + **Show full author list**

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Abstract *Croton heliotropiifolius* Kunth (Euphorbiaceae), whose occurrence has already been registered in the most varied Brazilian biomes, is commonly found in the Chapada do Araripe, Ceará. The species is traditionally used to treat fungal, parasitic, and degenerative diseases. This study investigated the chemical composition **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Activity of Extracts from Plant** (/journal/antibiotics/special_issues/antimicrobial_anti_plant))

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Open Access Article (/2079-6382/10/9/1073/pdf?version=1631158043)

New Technique for Custom-Made Spacers in Septic Two-Stage Revision of Total Hip Arthroplasties (/2079-6382/10/9/1073)

by **Moritz Mederake (https://sciprofiles.com/profile/1739873)**, **Ulf Krister Hofmann (https://sciprofiles.com/profile/author/N3FZL3lRSjNvRU1tYjBNdFlkYmtySXNXQlhycUMxZUtWSjhoUFFPRTJEbHJ2T001TE** and **Bernd Fink (https://sciprofiles.com/profile/1268972)**

Antibiotics **2021**, *10*(9), 1073; **https://doi.org/10.3390/antibiotics10091073 (https://doi.org/10.3390/antibiotics10091073)** - 04 Sep 2021

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Abstract The choice of spacer in the interim phase of two-stage revision hip arthroplasty is crucial. Conventional concepts like a Girdlestone situation, handformed or preformed bone cement spacers show complications like soft-tissue contractions, abrasion of bone cement particles, dislocation, breakage and a low level **[...] Read more.**

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Open Access Article (/2079-6382/10/9/1072/pdf?version=1630753657)

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D-Mannoside FimH Inhibitors as Non-Antibiotic Alternatives for Uropathogenic *Escherichia coli* (/2079-6382/10/9/1072)

by Alfredo Montes-Robledo (https://sciprofiles.com/profile/1708799), Rosa Baldiris-Avila (https://sciprofiles.com/profile/377505) and Johan Fabian Galindo (https://sciprofiles.com/profile/1509366)

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Abstract FimH is a type I fimbria of uropathogenic *Escherichia coli* (UPEC), recognized for its ability to adhere and infect epithelial urinary tissue. Due to its role in the virulence of UPEC, several therapeutic strategies have focused on the study of FimH, including vaccines, **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Resistance (AMR) in Plant and Soil Microbiome (/journal/antibiotics/special_issues/AMR_antibiotics)**)

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Enhanced Antibacterial Potential of Amoxicillin against *Helicobacter pylori* Mediated by Lactobionic Acid Coated Zn-MOFs (/2079-6382/10/9/1071)

by Haseena (https://sciprofiles.com/profile/1689813), Adnan Khan (https://sciprofiles.com/profile/871615), Fariha Aslam (https://sciprofiles.com/profile/author/WUhvWjJmQ3BIMnVROVVtT0VZZVIxSE1TMVlFVmlna1RwZ3hWM29BMHhkST0=), Tasmina Kanwal (https://sciprofiles.com/profile/1937972), Muhammad Raza Shah (https://sciprofiles.com/profile/1012850), Atif Ali Khan Khalil (https://sciprofiles.com/profile/784877), Syed Wadood Ali Shah (https://sciprofiles.com/profile/1379098), Eida M. Alshammari (https://sciprofiles.com/profile/1682594), Eman A. El-Masry (https://sciprofiles.com/profile/938875), Gaber El-Saber Batiha (https://sciprofiles.com/profile/1084723) and Roua S. Baty (https://sciprofiles.com/profile/1748260)

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Abstract *H. pylori* (*Helicobacter pylori*) causes a common chronic infectious disease and infects around 4.4 billion people worldwide. *H. pylori* was classified as a member of the primary class of stomach cancer (stomach adenocarcinoma). Hence, this study was conducted to design a **[...] Read more.**

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Hospital Wastewater—Source of Specific Micropollutants, Antibiotic-Resistant Microorganisms, Viruses, and Their Elimination (/2079-6382/10/9/1070)

by Tomáš Mackuľak (https://sciprofiles.com/profile/1471698), Klára Cverenkárová (https://sciprofiles.com/profile/2860661), Andrea Vojs Staňová (https://sciprofiles.com/profile/1728873), Miroslav Fehér (https://sciprofiles.com/profile/author/SmhvQWw3N1crUzU1bkR5TVZmQk5tWFJDYjNZWjYzME5rZmNZbmRvZGNPRT0=), Michal Tamáš (https://sciprofiles.com/profile/2326575), Andrea Bútor Škulcová (https://sciprofiles.com/profile/author/ei9uY0tCcFo2Tlh5cmtjM2Y2OVdRWUZ3bU1oV3Fyd3dxV2NDT01qUkZjMD0=), Miroslav Gál (https://sciprofiles.com/profile/1471699), Monika Naumowicz (https://sciprofiles.com/profile/821314), Viera Špalková (https://sciprofiles.com/profile/1604530) and Lucia Bírošová (https://sciprofiles.com/profile/1293081)

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Abstract Municipal wastewaters can generally provide real-time information on drug consumption, the incidence of specific diseases, or establish exposure to certain agents and determine some lifestyle consequences. From this point of view, wastewater-based epidemiology represents a modern diagnostic tool for describing the health status **[...] Read more.**

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Open Access Review (/2079-6382/10/9/1069/pdf?version=1630915645)

How Do We Determine the Efficacy of an Antibacterial Surface? A Review of Standardised Antibacterial Material Testing Methods (/2079-6382/10/9/1069)

by Alexander J. Cunliffe (https://sciprofiles.com/profile/1781994), Peter D. Askew (https://sciprofiles.com/profile/author/QUtJdGlwSmQ2dW5Gb2h2UlZBWXNZT2JFK1VGaXlyL003MXJsdnRQMFR4ST0=), Ina Stephan (https://sciprofiles.com/profile/author/cDJlK00vdG10MVFGM2RCS0dCZVhzTVUrYnk1OGdmUWZNd0Jhb2FXUTVNdz0=), Gillian Tredale (https://sciprofiles.com/profile/author/TTZnb0l4NDV4UmM4a1VEUTJPVHhvWkxPak1VSmU5Vlo5VElqelpaK05jVT0=), Patrick Cosemans (https://sciprofiles.com/profile/624583), Lisa M. Simmons (https://sciprofiles.com/profile/author/VEEwNUNpRHBHUDg3RXlwQXAzSkk2dHBUV[illegible]), Joanna Verran (https://sciprofiles.com/profile/539011) and James Redfern (https://sciprofiles.com/profile/515815)

Antibiotics **2021**, *10*(9), 1069; https://doi.org/10.3390/antibiotics10091069 (https://doi.org/10.3390/antibiotics10091069) - 03 Sep 2021

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Abstract Materials that confer antimicrobial activity, be that by innate property, leaching of biocides or design features (e.g., non-adhesive materials) continue to gain popularity to combat the increasing and varied threats from microorganisms, e.g., replacing inert surfaces in hospitals with copper. To understand how **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Materials and Surface (/journal/antibiotics/special_issues/anti_material)**)

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Characterization and Evaluation of Layered Bi_2WO_6 Nanosheets as a New Antibacterial Agent (/2079-6382/10/9/1068)

by Maria Karollyna do Nascimento Silva Leandro (https://sciprofiles.com/profile/author/L2YxQXM3c3dRNWEwV2NwMmU4dDcrTnpsd3FiMXMwT[illegible]), João Victor Barbosa Moura (https://sciprofiles.com/profile/1695374), Paulo de Tarso Cavalcante Freire (https://sciprofiles.com/profile/author/QlNCbVlVRmJRMmV0NUZOeUlEek1kSXhCVWlDL0d2Y1NhcWJ3OTdz[illegible]), Maria Leticia Vega (https://sciprofiles.com/profile/author/cVhEeFVibHFmYll2ckp3ajFmcnlPY3pqMzVlRjhLSEpDckJFQUpWenRKdz0=), Cleânio da Luz Lima (https://sciprofiles.com/profile/680066), Ángel Alberto Hidalgo (https://sciprofiles.com/profile/author/b1c5aCs5bm03bzhMRTcyVWFwdlNKem82OTNKZ1hkSk5SdkUvSWlqdTE0MD0=), Ana Carolina Justino de Araújo (https://sciprofiles.com/profile/885792), Priscilla Ramos Freitas (https://sciprofiles.com/profile/author/SUluMGlBenNVY3BjSmhiWXNjRzJ6VTB1allvWVVMcXdqeVB3d1hYQklLaz0=), Cicera Laura Roque Paulo (https://sciprofiles.com/profile/author/K3BmYTJmdWl5R1l1cHlvTkVDUUJTK1FiRi9tN0F6c3dXY2QwMHplM0dCOD0[illegible]), Amanda Karine de Sousa (https://sciprofiles.com/profile/author/SUxmUU1VRmdBNm9lWnppZjdxcGNSYXlpTWdiTUpTcTNXVWR3NmVlL2FQb[illegible]), Janaina Esmeraldo Rocha (https://sciprofiles.com/profile/author/cllIN0FOMzU5ZVlLT0orbzl6Rm5ncHJwd0lGNlJOMmpBNzhaRElYcFhmRT0=), Lívia Maria Garcia Leandro (https://sciprofiles.com/profile/author/S1QyM0RGZ3JLMXo3SGJUZGpSbVBuUTNlc0p6enF4V2kyOS92VFJpaXZHT[illegible]), Rakel Olinda Macedo da Silva (https://sciprofiles.com/profile/author/clBWSGNUQjlRdjVrbU1MM25lc2JRbWlxT1BiakpoNTFpWE5FTXVwTFdlOE[illegible]), Natália Cruz-Martins (https://sciprofiles.com/profile/249276) and Henrique Douglas Melo Coutinho (https://sciprofiles.com/profile/1298311)

Antibiotics **2021**, *10*(9), 1068; https://doi.org/10.3390/antibiotics10091068 (https://doi.org/10.3390/antibiotics10091068) - 03 Sep 2021

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Abstract Background: Pathogenic microorganisms are causing increasing cases of mortality and morbidity, along with alarming rates of ineffectiveness as a result of acquired antimicrobial resistance. Bi_2WO_6 showed good potential to be used as an antibacterial substance when exposed to visible **[...]** **Read more.**

(This article belongs to the Special Issue **The Global Need for New Antimicrobial and Antibiofilm Agents (/journal/antibiotics/special_issues/Global_Antimicrobials)**)

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What Matters in Piglets' Exposure to Antibiotics Administered through Drinking Water? (/2079-6382/10/9/1067)

by Malika Chassan (https://sciprofiles.com/profile/1709622), Anne Hémonic (https://sciprofiles.com/profile/author/cGgyRVFtWndEWGxWUHJHTWpLblIpK3NyMkFQYUJTbC9ZRlIwMUhkSHJ3bz0=) and Didier Concordet (https://sciprofiles.com/profile/1796064)

Antibiotics **2021**, *10*(9), 1067; https://doi.org/10.3390/antibiotics10091067 (https://doi.org/10.3390/antibiotics10091067) - 03 Sep 2021

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Abstract A number of drugs are given in drinking water in piglet farming, although this way of administering drugs leads to significant and uncontrolled variability in exposures. Three main explanations for this variability have been described in the literature: (1) the drinking behavior of **[...] Read more.**

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Antibiotic-Resistant Genes and Bacteria as Evolving Contaminants of Emerging Concerns (e-CEC): Is It Time to Include Evolution in Risk Assessment? (/2079-6382/10/9/1066)

by **Alberto Vassallo (https://sciprofiles.com/profile/1045151)**, **Steve Kett (https://sciprofiles.com/profile/author/N2RIWUpURndQRE5YODBTREtqMIlya1Rmandza0l1enhJTzBmV05nN1NCST0=)**, **Diane Purchase (https://sciprofiles.com/profile/1428057)** and **Massimiliano Marvasi (https://sciprofiles.com/profile/1149192)**

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Abstract The pressing issue of the abundance of antibiotic resistance genes and resistant bacteria in the environment (ARGs and ARB, respectively) requires procedures for assessing the risk to health. The chemo-centric environmental risk assessment models identify hazard(s) in a dose–response manner, obtaining exposure, toxicity, **[...] Read more.**

(This article belongs to the Special Issue **Antimicrobial Resistance and the Environment: One Health Approach (/journal/antibiotics/special_issues/Antimicrobial_Environment)**)

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The First Report of *mcr-1*-Carrying *Escherichia coli* Originating from Animals in Serbia (/2079-6382/10/9/1063)

by **Dušan Mišić (https://sciprofiles.com/profile/1081010)**, **Ferenc Kiskaroly (https://sciprofiles.com/profile/author/Q2Z0NTN6SnRxay9lL2VnQmYrb09LL3dvd3ZuMkRCNkNYbkFyUnVpY25pdz0=)**, **Michael P. Szostak (https://sciprofiles.com/profile/983693)**, **Adriana Cabal (https://sciprofiles.com/profile/1755835)**, **Werner Ruppitsch (https://sciprofiles.com/profile/1680920)**, **Tanja Bernreiter-Hofer (https://sciprofiles.com/profile/1698874)**, **Viktoria Milovanovic (https://sciprofiles.com/profile/1793789)**, **Andrea T. Feßler (https://sciprofiles.com/profile/813864)**, **Franz Allerberger (https://sciprofiles.com/profile/author/M0ICK2RnODZjYjRON3JHTkRSS3FhMWEyTm90cmhaa2lITFBQNjRQYmxGVT0=)**, **Joachim Spergser (https://sciprofiles.com/profile/352509)**, **Elke Müller (https://sciprofiles.com/profile/author/N1FrbzRiek1zSVFQS2N1UitBcHJubVE1SC9nWmprR094UFFPYThLTFA2Yz0=)**, **Stefan Schwarz (https://sciprofiles.com/profile/573691)**, **Sascha D. Braun (https://sciprofiles.com/profile/1772461)**, **Stefan Monecke (https://sciprofiles.com/profile/2396762)**, **Ralf Ehricht (https://sciprofiles.com/profile/author/c296UUdOTmNraVVXMWtwUXNaSU9OSWdEcDFBK3RxOHJTNUJYakZOT2E1dz0=)**, **Maciej Korus (https://sciprofiles.com/profile/author/ekg3bURFd1dES0Fhck4rUFprTmh6VndiRU5FU0E3SkI5dkxKMGcwbXI1TT0=)**, **Damir Benković (https://sciprofiles.com/profile/1791265)**, **Malgorzata Korzeniowska (https://sciprofiles.com/profile/1060421)** and **Igor Loncaric (https://sciprofiles.com/profile/637913)**

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Abstract The aim of this study was continuous monitoring of the presence of *mcr-1* to *mcr-5* genes in *Enterobacterales* isolated from cattle, pigs, and domestic poultry at intensive breeding facilities in Northern Vojvodina, Serbia, from 1 January 1 to 1 October 2020. Out of **[...] Read more.**

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Compound Prioritization through Meta-Analysis Enhances the Discovery of Antimicrobial Hits against Bacterial Pathogens (/2079-6382/10/9/1065)

by **Loic Deblais (https://sciprofiles.com/profile/author/WFpLWUI1S3A0MWNkdlpSTEd5YVBwQmg2cUg5V2o2bmh5eDM4eTY1UUx5bz0=)** and **Gireesh Rajashekara (https://sciprofiles.com/profile/1446211)**

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Abstract The development of informatic tools to improve the identification of novel antimicrobials would significantly reduce the cost and time of drug discovery. We previously screened several plant (*Xanthomonas* sp., *Clavibacter* sp., *Acidovorax* sp., and *Erwinia* sp.), animal (Avian pathogenic *Escherichia coli* **[...] Read more.**

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Functionalized Nanoparticles Activated by Photodynamic Therapy as an Antimicrobial Strategy in Endodontics: A Scoping Review (/2079-6382/10/9/1064)

by **Pablo Betancourt (https://sciprofiles.com/profile/832536)**, **Nadia Brocal (https://sciprofiles.com/profile/1782670)**, **Eulàlia Sans-Serramitjana (https://sciprofiles.com/profile/1793181)** and **Carlos Zaror (https://sciprofiles.com/profile/1744554)**

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Abstract The eradication of endodontic pathogens continues to be the focus of the search for new root canal system (RCS) disinfection strategies. This scoping review provides a comprehensive synthesis of antimicrobial photodynamic therapy (aPDT) using nanoparticles (NPs) as an alternative to optimize RCS disinfection. **[...] Read more.**

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Syzygium aromaticum Extracts as a Potential Antibacterial Inhibitors against Clinical Isolates of *Acinetobacter baumannii*: An In-Silico-Supported In-Vitro Study (/2079-6382/10/9/1062)

by **Abdelhamed Mahmoud (https://sciprofiles.com/profile/1770132)**, **Magdy M. Afifi (https://sciprofiles.com/profile/1324344)**, **Fareed El Shenawy (https://sciprofiles.com/profile/author/VXNGcXpXRXRnVXFvb2hCZjNmSk9PZ3pJTWh4cmhCOCtiS0VlVWVLcTcyYz0=)**, **Wesam Salem (https://sciprofiles.com/profile/820127)** and **Basem H. Elesawy (https://sciprofiles.com/profile/1503193)**

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Abstract Imipenem is the most efficient antibiotic against *Acinetobacter baumannii* infection, but new research has shown that the organism has also developed resistance to this agent. *A. baumannii* isolates from a total of 110 clinical samples were identified by multiplex PCR. The antibacterial activity **[...] Read more.**

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The Emergence of Multidrug-Resistant *Helicobacter pylori* in Southeast Asia: A Systematic Review on the Trends and Intervention Strategies Using Antimicrobial Peptides (/2079-6382/10/9/1061)

by **Asif Sukri (https://sciprofiles.com/profile/1754023)**, **Bruno S. Lopes (https://sciprofiles.com/profile/2089322)** and **Alfizah Hanafiah (https://sciprofiles.com/profile/1753742)**

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Abstract The emergence of multidrug-resistant *H. pylori* poses a public healthcare threat, particularly in low- and middle-income countries. Recently, the World Health Organization has classified clarithromycin-resistant *H. pylori* as high priority in the research and discovery of novel antibiotics. This study was aimed to **[...] Read more.**

(This article belongs to the Special Issue **Interventions to Reduce Antimicrobial Resistance in Low and Middle-Income Countries (/journal/antibiotics/special_issues/Interventions_Antibiotics)**)

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Non-Antimicrobial Adjuvant Strategies to Tackle Biofilm-Related *Staphylococcus aureus* Prosthetic Joint Infections (/2079-6382/10/9/1060)

by **Narayan Pant (https://sciprofiles.com/profile/1751996)** and **Damon P. Eisen (https://sciprofiles.com/profile/1606762)**

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Abstract *Staphylococcus aureus* frequently causes community- and hospital-acquired infections. *S. aureus* attachment followed by biofilm formation on tissues and medical devices plays a significant role in the establishment of chronic infections. Staphylococcal biofilms encase bacteria in a matrix and protect the cells from antimicrobials **[...] Read more.**

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Taxonomic and Functional Distribution of Bacterial Communities in Domestic and Hospital Wastewater System: Implications for Public and Environmental Health (/2079-6382/10/9/1059)

by **Ramganesh Selvarajan (https://sciprofiles.com/profile/255355)**, **Timothy Sibanda (https://sciprofiles.com/profile/163107)**, **Jeevan Pandian (https://sciprofiles.com/profile/author/cGIBMVB0RXIsbXU3OTdVZytZd1Y5U3hSQm5HTlFuVFFTWjlneitsWlowND0=)** and **Kevin Mearns (https://sciprofiles.com/profile/1770158)**

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Abstract The discharge of untreated hospital and domestic wastewater into receiving water bodies is still a prevalent practice in developing countries. Unfortunately, because of an ever-increasing population of people who are perennially under medication, these wastewaters contain residues of antibiotics and other antimicrobials as **[...] Read more.**

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Antibiotic Resistance Prevalence and Trends in Patients Infected with *Helicobacter pylori* in the Period 2013–2020: Results of the European Registry on *H. pylori* Management (Hp-EuReg) (/2079-6382/10/9/1058)

by **Luis Bujanda (https://sciprofiles.com/profile/475387)**, **Olga P. Nyssen (https://sciprofiles.com/profile/2071591)**, **Dino Vaira (https://sciprofiles.com/profile/924822)**, **Ilaria M. Saracino (https://sciprofiles.com/profile/947850)**, **Giulia Fiorini (https://sciprofiles.com/profile/author/Y0tXZWhEaHNjcGlHY0x4aEh4Y1hSUnlLZDU5N0RiTnhLY2s0OEo4WVdXRT0=)**, **Frode Lerang (https://sciprofiles.com/profile/author/Nm11R2FYUUtsb2F4a3h5UUdtTHNaMXI3T0g1VUx5aWZ5VU5pOS9CdlJZaz0=)**, **Sotirios Georgopoulos (https://sciprofiles.com/profile/author/NjlzVHVTa25TV3lST20zQWdjWjFXYjFFUXh3SHBGdDZ4c3phdTZXN3lmST0=)**, **Bojan Tepes (https://sciprofiles.com/profile/1433492)**, **Frederic Heluwaert (https://sciprofiles.com/profile/author/YUwwUGNLS0NwWFp5RTJEanphVGRmUjFTeIFua09EbWdMMDU5SzBRcUc4QT0=)**, **Antonio Gasbarrini (https://sciprofiles.com/profile/518909)**, **Theodore Rokkas (https://sciprofiles.com/profile/author/YVhSanAwT2JWYU9CUHo3czRybmY0RjB3ektLZGNUSFFVVzJiSGhMcnA0MD0=)**, **Dmitry Bordin (https://sciprofiles.com/profile/author/bVVxUDMxZnB6bGZGY1YwZktlNVhFZz09)**, **Sinead Smith (https://sciprofiles.com/profile/author/U3d0YUJhQVZiSFI3Y2ZuMnc3Mk83UT09)**, **Vincent Lamy (https://sciprofiles.com/profile/author/eXd1VGFlaDJORnArZk9YUFI0bGlGUzNsN291N2I2Z3FGT1puUk5MTmJqZz0=)**, **María Caldas (https://sciprofiles.com/profile/1367109)**, **Elena Resina (https://sciprofiles.com/profile/1708395)**, **Raquel Muñoz (https://sciprofiles.com/profile/author/eDhPSXNMUU1xVUhPTVVWby9JY251RUwzU01Tc2UxT0ZqWFNWckw3Y2ZlQT0=)**, **Ángel Cosme (https://sciprofiles.com/profile/author/cWZjZ203WEdyeGlja2YySjVLV2dYTy8xRWVHbVZNZk1UU1NaVUsyUjFEOEJpTjFWVngvdn**, **Ignasi Puig (https://sciprofiles.com/profile/1779834)**, **Francis Megraud (https://sciprofiles.com/profile/1966939)**, + **Show full author list**

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Abstract *Background*: Bacterial antibiotic resistance changes over time depending on multiple factors; therefore, it is essential to monitor the susceptibility trends to reduce the resistance impact on the effectiveness of various treatments. *Objective*: To conduct a time-trend analysis of *Helicobacter pylori* resistance **[...] Read more.**

(This article belongs to the Special Issue **Helicobacter pylori: Antibiotic Resistance and Treatment (/journal/antibiotics/special_issues/H_pylori)**)

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Tylosin Dosage Adjustment Based on Allometric Scaling in Male Turkeys (/2079-6382/10/9/1057)

by **Błażej Poźniak (https://sciprofiles.com/profile/1324726)**, **Marta Tikhomirov (https://sciprofiles.com/profile/1378883)**, **Kamila Bobrek (https://sciprofiles.com/profile/1417642)**, **Paweł Jajor (https://sciprofiles.com/profile/845573)** and **Marcin Świtała (https://sciprofiles.com/profile/author/dFJuWmUwTkxaZEp2ZHRNSk5LQW93dWp5dXg1dUR0ZHJZUlFlSk8xSUZtWT0=)**

Antibiotics **2021**, *10*(9), 1057; **https://doi.org/10.3390/antibiotics10091057 (https://doi.org/10.3390/antibiotics10091057)** - 31 Aug 2021
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Abstract Turkeys' body weight (BW) increases 10-fold within only 2.5 months, leading to a change in the pharmacokinetics (PK) of drugs according to allometric principles. Thus, the same dosage may lead to age-dependent variability in efficacy, in particular, to treatment failure and/or selection for **[...] Read more.**

(This article belongs to the Special Issue **Optimization and Improvement of Veterinary Antimicrobial Treatment to Reduce Antimicrobial Resistance (/journal/antibiotics/special_issues/veterinary_antimicrobial_treatment)**)

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Open Access Brief Report **(/2079-6382/10/9/1056/pdf?version=1630473433)**

Antibiotic Use during the COVID-19 Pandemic in a Tertiary Hospital with an Ongoing Antibiotic Stewardship Program (/2079-6382/10/9/1056)

by **Oryan Henig (https://sciprofiles.com/profile/1747203)**, **Orli Kehat (https://sciprofiles.com/profile/1769757)**, **Suzy E. Meijer (https://sciprofiles.com/profile/author/R3NJUzlvNzVOQm1vblQ3NklBdTB0TVkxSE5veW92U2gwbFIzR0VYWUZLUT0=)**, **Amanda Chikly (https://sciprofiles.com/profile/1786804)**, **Ahuva Weiss-Meilik (https://sciprofiles.com/profile/author/R0N2OC9tbGF5dnRycFU2aWlZS0FSOCtCOEVlYVlybUNydm1qVm11aDA1WT0=)**, **Eyal Egoz (https://sciprofiles.com/profile/author/MHRiVXRldENlOXJJalZKdDJrYmF6TXVUTVZSL21RYlhPRHU2L2RJRkZwaz0=)**, **Ronen Ben-Ami (https://sciprofiles.com/profile/484326)** and **Yael Paran (https://sciprofiles.com/profile/author/aWFzam9aOVBjVHVZc3pWRjFaU3Y2WW03VS9oRERiTm5wZzVPV05seWJyST0=)**

Antibiotics **2021**, *10*(9), 1056; **https://doi.org/10.3390/antibiotics10091056 (https://doi.org/10.3390/antibiotics10091056)** - 31 Aug 2021
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Abstract During the recent pandemic, the fact that the clinical manifestation of COVID-19 may be indistinguishable from bacterial infection, as well as concerns of bacterial co-infection, have been associated with an increased use of antibiotics. The objective of this study was to assess the **[...] Read more.**

(This article belongs to the Special Issue **Antibiotic Stewardship during COVID-19 (/journal/antibiotics/special_issues/Antibiotic_COVID-19)**)

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Open Access Article **(/2079-6382/10/9/1055/pdf?version=1630407799)**

Risk Indicators for Urinary Tract Infections in Low Risk Pregnancy and the Subsequent Risk of Preterm Birth (/2079-6382/10/9/1055)

by **Dominique E. Werter (https://sciprofiles.com/profile/1710557)**, **Brenda M. Kazemier (https://sciprofiles.com/profile/author/bEtjK3ZoT1FDc3RVcGxVVWZ6TmNlZlIsRFVlbXcvaTl0YTUzb3VndGZoZz0=)**, **Caroline Schneeberger (https://sciprofiles.com/profile/author/RmxXZFdwQkdpWldkM3lFcDEyUWRCVDJPeGhyMUlxQmo5eU0wSHhrNWtPbz0**, **Ben W. J. Mol (https://sciprofiles.com/profile/author/aEgwUS80Mk1IcnFEazZpNG1jUytvNUZBbGd1UTZnS21GUjlHeDJTQThqQT0=)**, **Christianne J. M. de Groot (https://sciprofiles.com/profile/author/ZENrZWFPaENiQTk0d0U5bVZKSnhQbGxNQ1A5dHVBRnpOWlBBTWt6YnVm**, **Suzanne E. Geerlings (https://sciprofiles.com/profile/author/RHhjWVRzYmZxYng5ei91UkNITE5LL2hQcDBSNlBKWTJ2KzZ3emh3OThjcz0=)** and **Eva Pajkrt (https://sciprofiles.com/profile/author/QUlqSHNLY1Q0cG5hRVJsNnhZc2dqMUlVbHFUV3c4WG5CTjdUd2UxRUw4ND0=)**

Antibiotics **2021**, *10*(9), 1055; **https://doi.org/10.3390/antibiotics10091055 (https://doi.org/10.3390/antibiotics10091055)** - 31 Aug 2021
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Abstract Symptomatic urinary tract infections are associated with preterm birth. However, data on risk indicators for urinary tract infections are limited and outdated. The research is a secondary analysis. The study was a prospective multicenter cohort study of low-risk pregnant women. Logistic regression was **[...] Read more.**

(This article belongs to the Special Issue **Difficult to Treat Infections in Urology (/journal/antibiotics/special_issues/infection_Urology)**)

Open Access Article **(/2079-6382/10/9/1054/pdf?version=1630594223)**

Colistin and Carbapenem-Resistant *Acinetobacter baumannii* Aci46 in Thailand: Genome Analysis and Antibiotic Resistance Profiling (/2079-6382/10/9/1054)

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by Nalumon Thadtapong (https://sciprofiles.com/profile/1743846), Soraya Chaturongakul (https://sciprofiles.com/profile/author/RnBGTTdwYTlvQ2dkWld5Q25EYk50MTI3dm4zbWduTzhaN3NWajdzbU5nUT0=), Sunhapas Soodvilai (https://sciprofiles.com/profile/1166073) and Padungsri Dubbs (https://sciprofiles.com/profile/1743796)
Antibiotics **2021**, *10*(9), 1054; https://doi.org/10.3390/antibiotics10091054 (https://doi.org/10.3390/antibiotics10091054) - 30 Aug 2021
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Abstract Resistance to the last-line antibiotics against invasive Gram-negative bacterial infection is a rising concern in public health. Multidrug resistant (MDR) *Acinetobacter baumannii* Aci46 can resist colistin and carbapenems with a minimum inhibitory concentration of 512 μg/mL as determined by microdilution method and shows **[...] Read more.**
(This article belongs to the Special Issue **Genomic Analysis of Antibiotics Resistance in Pathogens** (/journal/antibiotics/special_issues/Gene_pathogen))

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Open Access Review (/2079-6382/10/9/1053/pdf?version=1630505452)

Fungal Biofilms as a Valuable Target for the Discovery of Natural Products That Cope with the Resistance of Medically Important Fungi—Latest Findings (/2079-6382/10/9/1053)

by Estefanía Butassi (https://sciprofiles.com/profile/2535939), Laura Svetaz (https://sciprofiles.com/profile/1411744), María Cecilia Carpinella (https://sciprofiles.com/profile/1019363), Thomas Efferth (https://sciprofiles.com/profile/9530) and Susana Zacchino (https://sciprofiles.com/profile/1738270)
Antibiotics **2021**, *10*(9), 1053; https://doi.org/10.3390/antibiotics10091053 (https://doi.org/10.3390/antibiotics10091053) - 30 Aug 2021
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Abstract The development of new antifungal agents that target biofilms is an urgent need. Natural products, mainly from the plant kingdom, represent an invaluable source of these entities. The present review provides an update (2017–May 2021) on the available information on essential oils, propolis, **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Activity of Plant-Derived Products and Synthetic Derivatives** (/journal/antibiotics/special_issues/Plant-derived_Products))

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Open Access Article (/2079-6382/10/9/1052/pdf?version=1630301247)

Antibiotics Use and Its Knowledge in the Community: A Mobile Phone Survey during the COVID-19 Pandemic in Bangladesh (/2079-6382/10/9/1052)

by Zubair Akhtar (https://sciprofiles.com/profile/1701235), Syeda Mah-E-Muneer (https://sciprofiles.com/profile/1569009), Md. Mahbubur Rashid (https://sciprofiles.com/profile/author/RG5uUUZqcDlLTGgvWjUxSnowVGVJd2s5U0dMa1BXN2Z0TnJLYklxM1F1cz0=), Md. Shakil Ahmed (https://sciprofiles.com/profile/author/bkZZc0NSRjl4QXk1VGl6WDY4cGdZNThVbE5UM1pSWldWZUI1K2diVVFpcz0=), Md. Ariful Islam (https://sciprofiles.com/profile/1786843), Sukanta Chowdhury (https://sciprofiles.com/profile/844584), Zobaid Khan (https://sciprofiles.com/profile/1893051), Md. Zakiul Hassan (https://sciprofiles.com/profile/736972), Khaleda Islam (https://sciprofiles.com/profile/1754876), Shahana Parveen (https://sciprofiles.com/profile/author/ZzI3OHpwRFlFSkw0WWVvQklXNHp6THBoY1BoS0RnLzF3ekg0YXZyNW9Gcz0=), Nitish Debnath (https://sciprofiles.com/profile/author/NDJCZ2JYTGt6L01uaXhLQVBEdzlmOWR6VG5KS1BJVGoxcnovVlJrdXJFbz0=), Mahmudur Rahman (https://sciprofiles.com/profile/author/U1RLMU81K3lqd2t3U1ZiSU52bHRYcWF5UnhvSzN1bmsrbjN1V1FNbHFPRT0=) and Fahmida Chowdhury (https://sciprofiles.com/profile/1829073)
Antibiotics **2021**, *10*(9), 1052; https://doi.org/10.3390/antibiotics10091052 (https://doi.org/10.3390/antibiotics10091052) - 29 Aug 2021
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Abstract The general population has been excessively using antibiotics during the COVID-19 pandemic. Therefore, the use of antibiotics for any reported illnesses in the preceding four weeks and knowledge of antibiotics among the general population in the community were assessed for possible interventions. A **[...] Read more.**
(This article belongs to the Special Issue **Antibiotic Use in the Communities** (/journal/antibiotics/special_issues/Communities_Antibiotics))

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Open Access Article (/2079-6382/10/9/1051/pdf?version=1630226471)

Genetic Characterization of the Tetracycline-Resistance Gene *tet*(X) Carried by Two *Epilithonimonas* Strains Isolated from Farmed Diseased Rainbow Trout, *Oncorhynchus mykiss* in Chile (/2079-6382/10/9/1051)

by Christopher Concha (https://sciprofiles.com/profile/1484796), Claudio D. Miranda (https://sciprofiles.com/profile/792989), Javier Santander (https://sciprofiles.com/profile/223614) and Marilyn C. Roberts (https://sciprofiles.com/profile/11232)
Antibiotics **2021**, *10*(9), 1051; https://doi.org/10.3390/antibiotics10091051 (https://doi.org/10.3390/antibiotics10091051) - 29 Aug 2021

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Abstract The main objective of this study was to characterize the *tet*(X) genes, which encode a monooxygenase that catalyzes the degradation of tetracycline antibiotics, carried by the resistant strains FP105 and FP233-J200, using whole-genome sequencing analysis. The isolates were recovered from fin lesion **[...] Read more.**
(This article belongs to the Special Issue **Antibiotic Resistance in Terrestrial and Aquatic Farmed Animals: An Urgent One Health Issue for Sustainability** (/journal/antibiotics/special_issues/farmed_animals))

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Open Access Article (/2079-6382/10/9/1050/pdf?version=1630143374)

Prevalence and Molecular Epidemiology of Extended-Spectrum-β-Lactamase (ESBL)-Producing *Escherichia coli* from Multiple Sectors of Poultry Industry in Korea (/2079-6382/10/9/1050)

by Hyunsoo Kim (https://sciprofiles.com/profile/1758776), Young Ah Kim (https://sciprofiles.com/profile/528999), Young Hee Seo (https://sciprofiles.com/profile/author/ejYyMFZvdkx0ajExdXJLUm1UcWlyOGdUZEhqc2xSMjYrVFA2RUtLNUNGRT0=), Hyukmin Lee (https://sciprofiles.com/profile/2466850) and Kyungwon Lee (https://sciprofiles.com/profile/529013)
Antibiotics **2021**, *10*(9), 1050; https://doi.org/10.3390/antibiotics10091050 (https://doi.org/10.3390/antibiotics10091050) - 28 Aug 2021
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Abstract The aim of this study was to investigate the molecular epidemiology of extended-spectrum-β-lactamase producing *Escherichia coli* (ESBL-EC) from poultry, the poultry farm environment, and workers in Korea. A total of 1376 non-duplicate samples were collected from 21 poultry farms, 20 retail stores, 6 **[...] Read more.**
(This article belongs to the Special Issue **Antibiotic Resistance and Infectious Diseases: A One Health Perspective** (/journal/antibiotics/special_issues/Infection_antibiotics))

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Synergistic Anticandidal Effects of Six Essential Oils in Combination with Fluconazole or Amphotericin B against Four Clinically Isolated *Candida* Strains (/2079-6382/10/9/1049)

by Bouchra Soulaimani (https://sciprofiles.com/profile/1065286), Elena Varoni (https://sciprofiles.com/profile/112690), Marcello Iriti (https://sciprofiles.com/profile/46909), Nour-Eddine Mezrioui (https://sciprofiles.com/profile/author/T3ppK1ZURldrZzcyczRnRnVUYUlOb1R2RzBsK3czRE5FSTRLRlEwVm1NND0=), Lahcen Hassani (https://sciprofiles.com/profile/1736773) and Abdelaziz Abbad (https://sciprofiles.com/profile/1751036)
Antibiotics **2021**, *10*(9), 1049; https://doi.org/10.3390/antibiotics10091049 (https://doi.org/10.3390/antibiotics10091049) - 27 Aug 2021
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Abstract The development of opportunistic pathogenic *Candida* strains insensitive to several classes of antifungals has emerged as a major health care problem during the last years. Combinational therapy of natural products (e.g., essential oils, EOs) with conventional antifungals has been suggested as a promising **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Plant Extracts and Phytochemicals, 2nd Volume** (/journal/antibiotics/special_issues/anti_plant_2nd))

Open Access Article (/2079-6382/10/9/1048/pdf?version=1630056178)

Topically Applied Bacteriophage to Control Multi-Drug Resistant *Klebsiella pneumoniae* Infected Wound in a Rat Model (/2079-6382/10/9/1048)

by Mohamed S. Fayez (https://sciprofiles.com/profile/1706291), Toka A. Hakim (https://sciprofiles.com/profile/1767979), Mona M. Agwa (https://sciprofiles.com/profile/1740255), Mohamed Abdelmoteleb (https://sciprofiles.com/profile/1759590), Rania G. Aly (https://sciprofiles.com/profile/1739298), Nada N. Montaser (https://sciprofiles.com/profile/1760032), Abdallah S. Abdelsattar (https://sciprofiles.com/profile/1332397), Nouran Rezk (https://sciprofiles.com/profile/1663761) and Ayman El-Shibiny (https://sciprofiles.com/profile/1212554)
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Abstract (Background): Multi-drug-resistant *Klebsiella pneumoniae* (MDR-KP) has steadily grown beyond antibiotic control. Wound infection kills many patients each year, due to the entry of multi-drug resistant (MDR) bacterial pathogens into the skin gaps. However, a bacteriophage (phage) is considered to be a potential antibiotic **[...] Read more.**
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Open Access Review (/2079-6382/10/9/1047/pdf?version=1630050979)

A Qualitative and Comprehensive Analysis of Caries Susceptibility for Dental Fluorosis Patients (/2079-6382/10/9/1047)

by Qianrui Li (https://sciprofiles.com/profile/1776751),
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Zhu Chen (https://sciprofiles.com/profile/author/U0JDcCtoS09WbVVKYkh1TTBrVFY2dFRPRXBseXJSWC9OWWpsZTdaRzVQZz0=) and
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Antibiotics **2021**, *10*(9), 1047; **https://doi.org/10.3390/antibiotics10091047 (https://doi.org/10.3390/antibiotics10091047)** - 27 Aug 2021
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Abstract Dental fluorosis (DF) is an endemic disease caused by excessive fluoride exposure during childhood. Previous studies mainly focused on the acid resistance of fluorotic enamel and failed to reach a consensus on the topic of the caries susceptibility of DF patients. In this **[...] Read more.**
(This article belongs to the Special Issue **Oral Microorganisms and Inactivation of Oral Biofilms (/journal/antibiotics/special_issues/oral_biofilm)**)

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Open Access Article (/2079-6382/10/9/1046/pdf?version=1630078709)

Variations in Antibiotic Use and Sepsis Management in Neonatal Intensive Care Units: A European Survey (/2079-6382/10/9/1046)

by Felipe Garrido (https://sciprofiles.com/profile/1729317), Karel Allegaert (https://sciprofiles.com/profile/614457),
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Miren Paniagua (https://sciprofiles.com/profile/author/YTR4cXNnQjhwdktLbUNWZ1I1amo5czR1K1Q1aFYzR1A1bEcyZ2hDVFNQTT0=),
Giacomo Cavallaro (https://sciprofiles.com/profile/220623) and
on behalf of European Antibiotics Study Group (EASG) (/search?authors=on%20behalf%20of%20European%20Antibiotics%20Study%20Group%20%28EASG%29&orcid=)
Antibiotics **2021**, *10*(9), 1046; **https://doi.org/10.3390/antibiotics10091046 (https://doi.org/10.3390/antibiotics10091046)** - 27 Aug 2021
Cited by 7 (/2079-6382/10/9/1046#metrics) | Viewed by 2442

Abstract Management of neonatal sepsis and the use of antimicrobials have an important impact on morbidity and mortality. However, there is no recent background on which antibiotic regimens are used in different European neonatal intensive care units (NICUs). Our study aimed to describe the **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Agents Used in Intensive Care Unit (/journal/antibiotics/special_issues/antibiotic_used)**)

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Open Access Article (/2079-6382/10/9/1045/pdf?version=1630563595)

In Vitro Activity of Propolis on Oral Microorganisms and Biofilms (/2079-6382/10/9/1045)

by Alexandra Stähli (https://sciprofiles.com/profile/969764), Hannah Schröter (https://sciprofiles.com/profile/2774771),
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Sigrun Eick (https://sciprofiles.com/profile/961188)
Antibiotics **2021**, *10*(9), 1045; **https://doi.org/10.3390/antibiotics10091045 (https://doi.org/10.3390/antibiotics10091045)** - 26 Aug 2021
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Abstract Natural products are being discussed as alternatives to commonly used chemicals in antimicrobial therapy. The study aimed to investigate the antimicrobial activity of propolis against microbial species associated with caries, periodontal disease, and Candida infections. Two commercially available ethanolic extracts of Brazilian and **[...] Read more.**
(This article belongs to the Special Issue **Plants, Algae and Fungi Extracts: Promising Resources in the Fight against Pathogens (/journal/antibiotics/special_issues/Algae_Pathogens)**)

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Open Access Review (/2079-6382/10/9/1044/pdf?version=1630464352)

Phytochemicals: A Promising Weapon in the Arsenal against Antibiotic-Resistant Bacteria (/2079-6382/10/9/1044)

by Bahman Khameneh (https://sciprofiles.com/profile/1727981), N. A. Michael Eskin (https://sciprofiles.com/profile/817470),
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Bibi Sedigheh Fazly Bazzaz (https://sciprofiles.com/profile/1729134)
Antibiotics **2021**, *10*(9), 1044; **https://doi.org/10.3390/antibiotics10091044 (https://doi.org/10.3390/antibiotics10091044)** - 26 Aug 2021
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Abstract The extensive usage of antibiotics and the rapid emergence of antimicrobial-resistant microbes (AMR) are becoming important global public health issues. Many solutions to these problems have been proposed, including developing alternative compounds with antimicrobial activities, managing existing antimicrobials, and rapidly detecting AMR pathogens. **[...] Read more.**
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Open Access Article (/2079-6382/10/9/1043/pdf?version=1629972738)

Anti-Inflammatory Effects of RTD-1 in a Murine Model of Chronic *Pseudomonas aeruginosa* Lung Infection: Inhibition of NF-κB, Inflammasome Gene Expression, and Pro-IL-1β Biosynthesis (/2079-6382/10/9/1043)

by Mansour A. Dughbaj (https://sciprofiles.com/profile/1756961),
Jordanna G. Jayne (https://sciprofiles.com/profile/author/OUY2a1J2REFUMkR4d3ZEWXp5RHBQdz09),
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Marquerita Algorri (https://sciprofiles.com/profile/1187460), Andre J. Ouellette (https://sciprofiles.com/profile/1757432),
Michael E. Selsted (https://sciprofiles.com/profile/1280526) and Paul M. Beringer (https://sciprofiles.com/profile/1494951)
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Abstract Vicious cycles of chronic airway obstruction, lung infections with *Pseudomonas aeruginosa*, and neutrophil-dominated inflammation contribute to morbidity and mortality in cystic fibrosis (CF) patients. Rhesus theta defensin-1 (RTD-1) is an antimicrobial macrocyclic peptide with immunomodulatory properties. Our objective was to investigate the **[...] Read more.**
(This article belongs to the Special Issue **Novel Strategies to Combat MDR Pathogens in CF (/journal/antibiotics/special_issues/CF_antibiotics)**)

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Antibiotic Resistance Genes and Associated Phenotypes in *Escherichia coli* and *Enterococcus* from Cattle at Different Production Stages on a Dairy Farm in Central California (/2079-6382/10/9/1042)

by Saharuetai Jeamsripong (https://sciprofiles.com/profile/2493841), Xunde Li (https://sciprofiles.com/profile/526583),
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Antibiotics **2021**, *10*(9), 1042; **https://doi.org/10.3390/antibiotics10091042 (https://doi.org/10.3390/antibiotics10091042)** - 26 Aug 2021
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Abstract The objectives of this study were to characterize overall genomic antibiotic resistance profiles of fecal *Escherichia coli* and *Enterococcus* spp. from dairy cattle at different production stages using whole-genome sequencing and to determine the association between antimicrobial resistance (AMR) phenotypes and their corresponding **[...] Read more.**
(This article belongs to the Special Issue **Antimicrobial Resistance: From Farm to Fork (/journal/antibiotics/special_issues/Farm_Fork)**)

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Characterisation of Early Positive *mcr-1* Resistance Gene and Plasmidome in *Escherichia coli* Pathogenic Strains Associated with Variable Phylogroups under Colistin Selection (/2079-6382/10/9/1041)

by Guerrino Macori (https://sciprofiles.com/profile/175973), Scott V. Nguyen (https://sciprofiles.com/profile/946555), Ankita Naithani (https://sciprofiles.com/profile/author/SndjZmpta2NVNjlDUThjZmEzc2RoZHQ0Q3JxTG9TSDU2S29QSmFWV3R4bz0=), Daniel Hurley (https://sciprofiles.com/profile/1700937), Li Bai (https://sciprofiles.com/profile/author/MkRucDdnbTNMemxvUThZdmRnNi9lUT09), Farid El Garch (https://sciprofiles.com/profile/author/R2dzN3hhdTVtdWtLekIHVGhtMDBPK0RmYkx2OHRReUFBS3k1RXZvTjRxdz0=), Frédérique Woehrlé (https://sciprofiles.com/profile/author/QTFjQ0ZOYVZhbHBHcndCWkc0bm9TVnVpbEVHUm13UXFabDVwWHczdGNhK2pK

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Abstract An antibiotic susceptibility monitoring programme was conducted from 2004 to 2010, resulting in a collection of 143 *Escherichia coli* cultured from bovine faecal samples (diarrhoea) and milk-aliquots (mastitis). The isolates were subjected to whole-genome sequencing and were distributed in phylogroups A, B1, B2, **[...] Read more.**

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The Impact of the COVID-19 Pandemic on Antibiotic Prescribing Trends in Outpatient Care: A Nationwide, Quasi-Experimental Approach (/2079-6382/10/9/1040)

by Tânia Magalhães Silva (https://sciprofiles.com/profile/1601418), Marta Estrela (https://sciprofiles.com/profile/1163327), Eva Rebelo Gomes (https://sciprofiles.com/profile/author/b3JSSnExNm0yQWVUQmN0VTEvMit1SzhjellZazNCK0t4M3dSemlMUm9vND0=), Maria Piñeiro-Lamas (https://sciprofiles.com/profile/author/UHNkMmZLaGl2c1JJb1hBb2Q3WnN4TEthK0VUR0dhUWhMT0NNMk9jTTd1ND0=), Adolfo Figueiras (https://sciprofiles.com/profile/1456087), Fátima Roque (https://sciprofiles.com/profile/318604) and Maria Teresa Herdeiro (https://sciprofiles.com/profile/974125)

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Abstract Coronavirus disease 2019 (COVID-19) has spread globally and is currently having a damaging impact on nearly all countries in the world. The implementation of stringent measures to stop COVID-19 dissemination had an influence on healthcare services and associated procedures, possibly causing antibiotic consumption **[...] Read more.**

(This article belongs to the Special Issue **Impact of Pandemic of COVID-19 on Antibiotic Prescription/Sales and on Antibiotic Resistances (/journal/antibiotics/special_issues/COVID_Antibiotics)**)

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Sars-Cov-2 Infection in Patients on Long-Term Treatment with Macrolides in Spain: A National Cross-Sectional Study (/2079-6382/10/9/1039)

by Carmen Marina Meseguer Barros (https://sciprofiles.com/profile/1756977), Natalia Alzueta Isturiz (https://sciprofiles.com/profile/1749157), Rita Sainz de Rozas Aparicio (https://sciprofiles.com/profile/author/YlloQ25BcWorbytrdWE4NWVBUEkxbDFlRUxCeEozT1dBeXcvdzd4T1A0NE

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Abstract The aim of this study was to know the prevalence and severity of COVID-19 in patients treated with long-term macrolides and to describe the factors associated with worse outcomes. A cross-sectional study was conducted in Primary Care setting. Patients with macrolides dispensed continuously **[...] Read more.**

(This article belongs to the Section **Antibiotic Therapy in Infectious Diseases (/journal/antibiotics/sections/antibiotic_therapy_infectious_diseases)**)

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Human-Associated Methicillin-Resistant *Staphylococcus aureus* Clonal Complex 80 Isolated from Cattle and Aquatic Environments (/2079-6382/10/9/1038)

by Khuliso Ramaite (https://sciprofiles.com/profile/author/eWl0Zk9CU1VhYWhJTWpVelVoWTlrMHFkalJKTG5Bek1WbEx1NUhLdmM2dz0=), Mutshiene Deogratias Ekwanzala (https://sciprofiles.com/profile/200718), John Barr Dewar (https://sciprofiles.com/profile/921259) and Maggy Ndombo Benteke Momba (https://sciprofiles.com/profile/42490)

Antibiotics **2021**, *10*(9), 1038; **https://doi.org/10.3390/antibiotics10091038 (https://doi.org/10.3390/antibiotics10091038)** - 25 Aug 2021

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Abstract Background: Human-associated methicillin-resistant *Staphylococcus aureus* (HA-MRSA) has mainly been reported in South African pig and chicken farms. The prevalence of antibiotic-resistant genes (ARGs), virulence factors (VFs), and multilocus sequence types (MLSTs) associated with HA-MRSA in cattle farms has not been reported. Consequently, this **[...] Read more.**

(This article belongs to the Special Issue **Antibiotics and Antibiotic Resistance in Aquatic Environments (/journal/antibiotics/special_issues/Aquatic_Environments_)**)

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Overexpression of the *adeB* Efflux Pump Gene in Tigecycline-Resistant *Acinetobacter baumannii* Clinical Isolates and Its Inhibition by (+)Usnic Acid as an Adjuvant (/2079-6382/10/9/1037)

by Nagaraju Bankan (https://sciprofiles.com/profile/1681761), Fathimunnisa Koka (https://sciprofiles.com/profile/1779214), Rajagopalan Vijayaraghavan (https://sciprofiles.com/profile/1705053), Sreekanth Reddy Basireddy (https://sciprofiles.com/profile/author/QTE3Wlh4d29CN3MvcWFaVS9qUURBQlV3aVJtdXVudGVibTZYTTZFcUZ2N and Selvaraj Jayaraman (https://sciprofiles.com/profile/1543089)

Antibiotics **2021**, *10*(9), 1037; https://doi.org/10.3390/antibiotics10091037 (https://doi.org/10.3390/antibiotics10091037) - 25 Aug 2021

Abstract *Acinetobacter* species are among the most life-threatening Gram-negative bacilli, causing hospital-acquired infections, and they are associated with high morbidity and mortality. They show multidrug resistance that acts via various mechanisms. In *Acinetobacter baumannii*, efflux pump-mediated resistance to many antimicrobial compounds, including tigecycline, [...] Read more.

(This article belongs to the Special Issue The Role of Efflux Pump Inhibitor in Bacterial Multidrug Resistance (/journal/antibiotics/special_issues/Bacterial_Multidrug_Resistance))

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Open Access Article (/2079-6382/10/9/1036/pdf?version=1629883692)

Detection of Oxytetracycline in Citrus Phloem and Xylem Saps Using Europium-Based Method (/2079-6382/10/9/1036)

by Faraj Hijaz (https://sciprofiles.com/profile/855494), Yasser Nehela (https://sciprofiles.com/profile/666279), Ozgur Batuman (https://sciprofiles.com/profile/507777) and Nabil Killiny (https://sciprofiles.com/profile/535288)

Antibiotics **2021**, *10*(9), 1036; https://doi.org/10.3390/antibiotics10091036 (https://doi.org/10.3390/antibiotics10091036) - 25 Aug 2021

Abstract Oxytetracycline (OTC) has been used for the control of several plant diseases and was recently approved for the control of Huanglongbing, the citrus greening disease. Huanglongbing is caused by the phloem limited '*Candidatus* Liberibacter asiaticus'. Determination of OTC in the xylem and [...] Read more.

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Diagnostic Methods of *Clostridioides difficile* Infection and *Clostridioides difficile* Ribotypes in Studied Sample (/2079-6382/10/9/1035)

by Elena Novakova (https://sciprofiles.com/profile/1076664), Zuzana Stofkova (https://sciprofiles.com/profile/1075330), Vladimira Sadlonova (https://sciprofiles.com/profile/1361397) and Lukas Hleba (https://sciprofiles.com/profile/1141832)

Antibiotics **2021**, *10*(9), 1035; https://doi.org/10.3390/antibiotics10091035 (https://doi.org/10.3390/antibiotics10091035) - 25 Aug 2021

Abstract Background: *Clostridioides* (*Clostridium*) *difficile* is the most common nosocomial pathogen and antibiotic-related diarrhea in health-care facilities. Over the last few years, there was an increase in the incidence rate of *C. difficile* infection cases in Slovakia. In this study, the phenotypic [...] Read more.

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Heteroaryl-Ethylenes as New Lead Compounds in the Fight against High Priority Bacterial Strains (/2079-6382/10/9/1034)

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Antibiotics **2021**, *10*(9), 1034; https://doi.org/10.3390/antibiotics10091034 (https://doi.org/10.3390/antibiotics10091034) - 25 Aug 2021

Abstract The widespread use of antibiotics has led to a gradual increase in drug-resistant bacterial infections, which severely weakens the clinical efficacy of antibacterial therapies. In recent decades, stilbenes aroused great interest because of their high bioavailability, as well as their manifold biological activity. [...] Read more.

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Antibiotics Used in Empiric Treatment of Ocular Infections Trigger the Bacterial Rcs Stress Response System Independent of Antibiotic Susceptibility (/2079-6382/10/9/1033)

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Abstract The Rcs phosphorelay is a bacterial stress response system that responds to envelope stresses and in turn controls several virulence-associated pathways, including capsule, flagella, and toxin biosynthesis, of numerous bacterial species. The Rcs system also affects antibiotic tolerance, biofilm formation, and horizontal gene [...] Read more.

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Antibiotic Usage and Resistance in Food Animal Production: What Have We Learned from Bangladesh? (/2079-6382/10/9/1032)

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Antibiotics **2021**, *10*(9), 1032; https://doi.org/10.3390/antibiotics10091032 (https://doi.org/10.3390/antibiotics10091032) - 24 Aug 2021

Abstract Irrational and inappropriate use of antibiotics in commercial chicken and aquaculture industries can accelerate the antibiotic resistance process in humans and animals. In Bangladesh, the growing commercial chicken and aquaculture industries are playing significantly important roles in the food value chain. It is [...] Read more.

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Incidence, Risk Factors and Impact on Clinical Outcomes of Bloodstream Infections in Patients Hospitalised with COVID-19: A Prospective Cohort Study (/2079-6382/10/9/1031)

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Abstract With the aim of describing the burden and epidemiology of community-acquired/healthcare-associated and hospital-acquired bloodstream infections (CA/HCA-BSIs and HA-BSIs) in patients hospitalised with COVID-19, and evaluating the risk factors for BSIs and their relative impact on mortality, an observational cohort study was performed on **[...] Read more.**

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Potential for Phages in the Treatment of Bacterial Sexually Transmitted Infections (/2079-6382/10/9/1030)

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Abstract Bacterial sexually transmitted infections (BSTIs) are becoming increasingly significant with the approach of a post-antibiotic era. While treatment options dwindle, the transmission of many notable BSTIs, including *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Treponema pallidum,* continues to increase. Bacteriophage therapy has been **[...] Read more.**

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Optical DNA Mapping of Plasmids Reveals Clonal Spread of Carbapenem-Resistant *Klebsiella pneumoniae* in a Large Thai Hospital (/2079-6382/10/9/1029)

by Sriram KK (https://sciprofiles.com/profile/1569026), Tsegaye Sewunet (https://sciprofiles.com/profile/1759559), Walaiporn Wangchinda (https://sciprofiles.com/profile/2442716), Teerawit Tangkoskul (https://sciprofiles.com/profile/author/UmxaYll4cnl3SVNheDVYQTg0ZDRTZ29lSzBtWkJVbUZ2TnZkb1NkdUw3TT0=), Visanu Thamlikitkul (https://sciprofiles.com/profile/779837), Christian G. Giske (https://sciprofiles.com/profile/author/RU9GakR3UDVleTlhN01PWnFodG00Q2EwNndGMllHTWtKVHp3NzZxbWJ0dz0=) and Fredrik Westerlund (https://sciprofiles.com/profile/1568981)

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Abstract Carbapenem-resistant *Klebsiella pneumoniae* (CR-KP) in patients admitted to hospitals pose a great challenge to treatment. The genes causing resistance to carbapenems are mostly found in plasmids, mobile genetic elements that can spread easily to other bacterial strains, thus exacerbating the problem. Here, we **[...] Read more.**

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Review

Mucormycosis in Indian COVID-19 Patients: Insight into Its Patho-Genesis, Clinical Manifestation, and Management Strategies

Ram Kumar Sahu [1,2], Mounir M. Salem-Bekhit [3,4,*], Bedanta Bhattacharjee [5], Yosif Almoshari [6], Abu Md Ashif Ikbal [7,*], Meshal Alshamrani [6], Alakesh Bharali [8], Ahmad Salawi [6], Retno Widyowati [1], Abdulrahman Alshammari [9] and Ibrahim Elbagory [10]

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Abstract: Mucormycosis in patients who have COVID-19 or who are otherwise immunocompromised has become a global problem, causing significant morbidity and mortality. Infection is debilitating and fatal, leading to loss of organs and emotional trauma. Radiographic manifestations are not specific, but diagnosis can be made through microscopic examination of materials collected from necrotic lesions. Treatment requires multidisciplinary expertise, as the fungus enters through the eyes and nose and may even reach the brain. Use of the many antifungal drugs available is limited by considerations of resistance and toxicity, but nanoparticles can overcome such limitations by reducing toxicity and increasing bioavailability. The lipid formulation of amphotericin-B (liposomal Am-B) is the first-line treatment for mucormycosis in COVID-19 patients, but its high cost and low availability have prompted a shift toward surgery, so that surgical debridement to remove all necrotic lesions remains the hallmark of effective treatment of mucormycosis in COVID-19. This review highlights the pathogenesis, clinical manifestation, and management of mucormycosis in patients who have COVID-19.

Keywords: COVID-19; mucormycosis; nanoparticles; pathogenesis; amphotericin-B

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Citation: Sahu, R.K.; Salem-Bekhit, M.M.; Bhattacharjee, B.; Almoshari, Y.; Ikbal, A.M.A.; Alshamrani, M.; Bharali, A.; Salawi, A.; Widyowati, R.; Alshammari, A.; et al. Mucormycosis in Indian COVID-19 Patients: Insight into Its Patho-Genesis, Clinical Manifestation, and Management Strategies. *Antibiotics* **2021**, *10*, 1079. https://doi.org/10.3390/antibiotics10091079

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1. Introduction

Mucormycosis, previously known as zygomycosis, is a lethal fungus in which molds called mucormycetes can cause fungal infection [1–3]. Mucormycosis causes angioinvasive infection among immunocompromised patients, with a mortality rate of 60% [4]. Mucormycosis is the third most prevalent fungal infection in hematology patients, accounting for 8.3–13% of all fungal infections [5,6]. Mucorales fungi access the human body mostly by inhalation, percutaneous contact, or ingestion [7]. Mucormycosis generally occurs in patients who are immunocompromised by leukemia, lymphoma, neutropenia, diabetes, burn,

trauma, childhood malnutrition, and the like [8,9]. Diabetes mellitus is the key vulnerability factor related to mucormycosis in India [10], which leads the world in mucormycosis as well as diabetes [11,12]. Mucormycosis is notoriously difficult to diagnose, with Ingram et al. having found that only 9% of cases were identified in antemortem diagnosis [13].

SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), the virus behind the COVID-19 outbreak, is linked to a variety of bacterial and fungal infections [14]. In India and some other countries, mucormycosis has co-occurred extensively with COVID-19 and is considered to be an epidemic by the Indian government based on reports of the infection mainly affecting hospitalized COVID-19 patients, leading to prolonged morbidity and death. Researchers have found that it chiefly affects immunocompromised patients admitted to the hospital when fungal spores enter a COVID-19–infected person through an airborne vector, affecting the sinuses and lungs, though rarely in persons who have strong immunity. Patients who have been treated for COVID-19 by using steroids and other drugs to cure inflammation are the most vulnerable to mucormycosis [14]. The erroneous administration of corticosteroids (i.e., Prednisone, Hydrocortisone, or Dexamethasone) is a contributing factor to mucormycosis infection in COVID-19 patients. Even though steroids are effective in treating respiratory illnesses including chronic obstructive pulmonary disease and asthma, and other illnesses such as rheumatoid arthritis, the long-term or excessive use of steroids suppresses the body's immunological system, making the person more susceptible to diseases such as mucormycosis infection [15].

The first case of black fungus was reported during the first wave of the COVID-19 pandemic in India, a couple of weeks after the patient's discharge from a hospital. During the second wave of COVID-19, infections were reported even while patients were undergoing hospital treatment. Although mucormycosis can be treated by antifungal medication, ultimately surgery is required. Traditionally treatment has involved intravenous infusion of regular saline followed by an infusion of amphotericin, but a lack of clinical trial data has hindered researchers and scientists from choosing specific antifungal agents for treating mucormycosis. Because of the high mortality associated with this infection, effective treatment requires early detection and depends on recovery from predisposing factors. The condition can also be improved through surgical debridement and administration of medication [16–18]. In India, 28,252 occurrences of mucormycosis, or black fungus, have been documented in 28 states and union territories, with Maharashtra and Gujarat accounting for the overwhelming majority [19]. Figure 1 illustrates the classification of fungi in the zygomycete order.

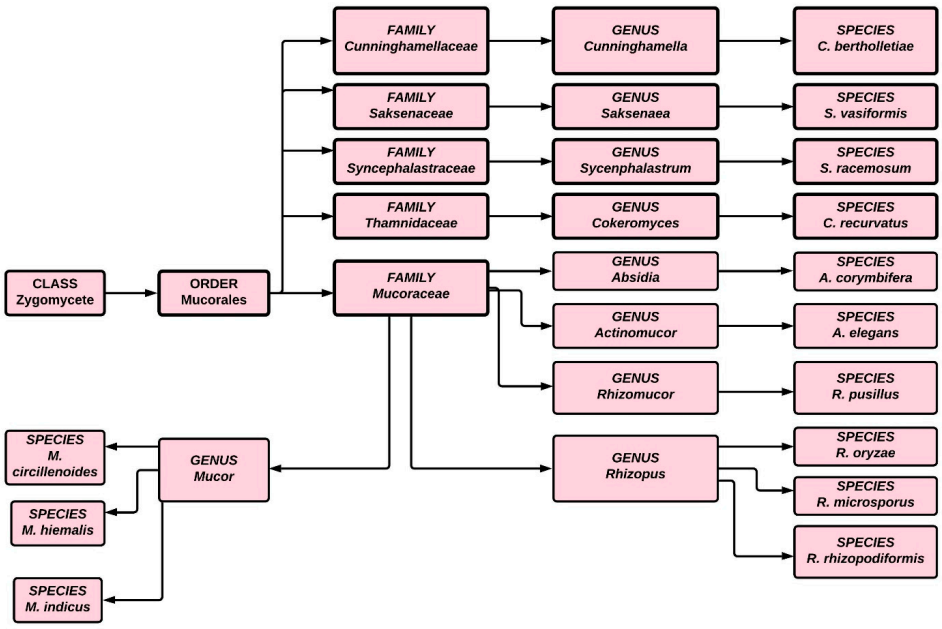

Figure 1. Classification of fungi in the zygomycete order.

2. Manifestation of Mucormycosis

Mucormycosis symptoms vary depending on where the fungus develops in the body [14,20]. Symptoms of rhinocerebral mucormycosis include black sores on the nasal bridge, fever, one-sided face edema, headache, and nasal congestion, whereas the symptoms of cutaneous mucormycosis are swelling around the wound, pain, and excessive redness. By contrast, the symptoms of pulmonary mucormycosis include breathlessness, chest pain, coughing, and fever. Finally, the symptoms of gastrointestinal mucormycosis include stomach pain, stomach bleeding, and nausea and vomiting.

Because disseminated mucormycosis develops in patients who have been admitted to the hospital for other diseases, determining which symptoms are caused by mucormycosis can be difficult. Eventually such patients may develop mental status changes that may lead to coma. Because some of the symptoms of mucormycosis and COVID-19 are similar, physicians may have difficulty determining whether an individual is infected with a fungus or with COVID-19. Furthermore, certain patients may have COVID-19 along with a fungal infection.

3. Epidemiology

According to recent data, the number of reported cases of mucormycosis has increased significantly [8]. For example, the incidence of mucormycosis has increased dramatically in major transplant facilities, with the number of patients more than doubling in 15 years [21,22]. Among autopsied individuals who had leukemia, the incidence of mucormycosis reached 8% in high-risk individuals, with diabetes mellitus reported in 54–76% of cases and diabetic ketoacidosis in 8–22%. In north India, individuals who had diabetes mellitus exhibited a 0.16–1.72% occurrence of mucormycosis [23,24]. Mucormycosis revealed diabetes in 24% of patients in south India, 40% in western India, and 43% in north India, reflecting a lack of routine health checkups among Indian people [25]. In India, 1–9% of mucormycosis patients have a hematological malignancy, compared with 38–62% in the United States and Europe [10,26]. The frequency of confirmed mucormycosis was 1.4% among 781 acute leukemia patients studied in north India [27]. In a study of acute myeloid leukemia patients in south India, the prevalence of verified mucormycosis cases was 0.9% [28]. In India, solid-organ transplantation is a risk factor in 2.6–11% of mucormycosis cases, compared with 7–14% globally [27]. Furthermore, in India, mucormycosis occurs in from 0.05% to 2.7% of renal transplant patients, versus 0.04–0.05% globally [29,30]. According to many investigations, mucormycosis is found in 0.56–1.52% of kidney transplant recipients in south India [31,32]. Steroid treatment, chronic obstructive pulmonary disease, chronic renal illness, and pulmonary tuberculosis are all risk factors for mucormycosis in India, where chronic kidney disease has emerged as a new risk factor for mucormycosis [33,34]. According to Indian studies, 9–32% of mucormycosis patients have chronic kidney disease [35]. Likewise, chronic obstructive pulmonary disease and pulmonary tuberculosis have been reported in 7–46% of individuals who had mucormycosis [35].

Low birth weight babies, chronic alcoholism, liver diseases, renal failure, intravenous drug use, malnutrition, and acquired immunodeficiency syndrome are all factors associated with mucormycosis [12]. Mucormycosis is exceedingly uncommon in HIV-positive individuals. Only two individuals developed mucormycosis in a retrospective analysis of 1630 autopsy of AIDS patients who died between 1984–2002 [36]. The most prevalent comorbidities were the usage of corticosteroid (25%), neutropenia (29.7%), and intravenous drug use (IVDU 50%). Individuals with a record of intravenous drug use who experienced mucormycosis are more likely to present with localized cerebral inflammation [37]. In Indian research published in 2019, chronic renal illness (8.9%) and post-pulmonary TB (6.9%) were identified as rising risk factors [31].

4. Pathogenesis Mechanism

4.1. Phagocytes

Mononuclear cells, macrophages, and neutrophils make up the second and most significant line of defense against intruding fungus. This immune system barricade is essentially twofold: Tissue macrophages aid in spore phagocytosis, whereas spores that escape and develop into hyphae cause neutrophil chemotaxis, which has an oxidative cytotoxic effect [38,39]. These cells directly kill as well as phagocytose spores and hyphae by producing and releasing perforin, antimicrobial enzymes, reactive oxygen metabolites, and cationic peptides [40]. They also release pro-inflammatory cytokines such as tumor necrosis factor (TNF)-α, interleukin-1 beta (IL-1b), and interferon-gamma (IFN-γ) which activate and attract other immune cells. Interruption or failure of this initial inflammatory response can cause tissue damage and infection dissemination [41]. Pro-inflammatory cytokines are decreased in COVID-19 patients, allowing the fungal infection to spread more widely. Fungi adhere to phagocyte particular pattern receptors via diverse pathogen-associated chemical patterns, causing activation and propagation of intracellular signals [42]. Toll-like receptors, particularly Toll-like receptor 2, are essential in the early stages of the pro-inflammatory response [43]. Numerous host conditions might impair phagocyte functioning, allowing Mucorales to invade more easily. Studies have indicated that corticosteroid treatment makes mouse pulmonary alveolar macrophages incapable of preventing sporangiospore germination [44]. In another work, simulated ketoacidosis circumstances inhibited phagocyte cytotoxicity and increased *R. oryzae* development, a result that was entirely recovered after acidosis was corrected [45]. In neutropenic patients who have mucormycosis, the Third European Conference on Leukemia Infections recommends use of granulocyte–macrophage colony-stimulating and granulocyte colony-stimulating factors in neutropenic patients only [46]. Figure 2 illustrates the etipathogenesis of mucormycosis.

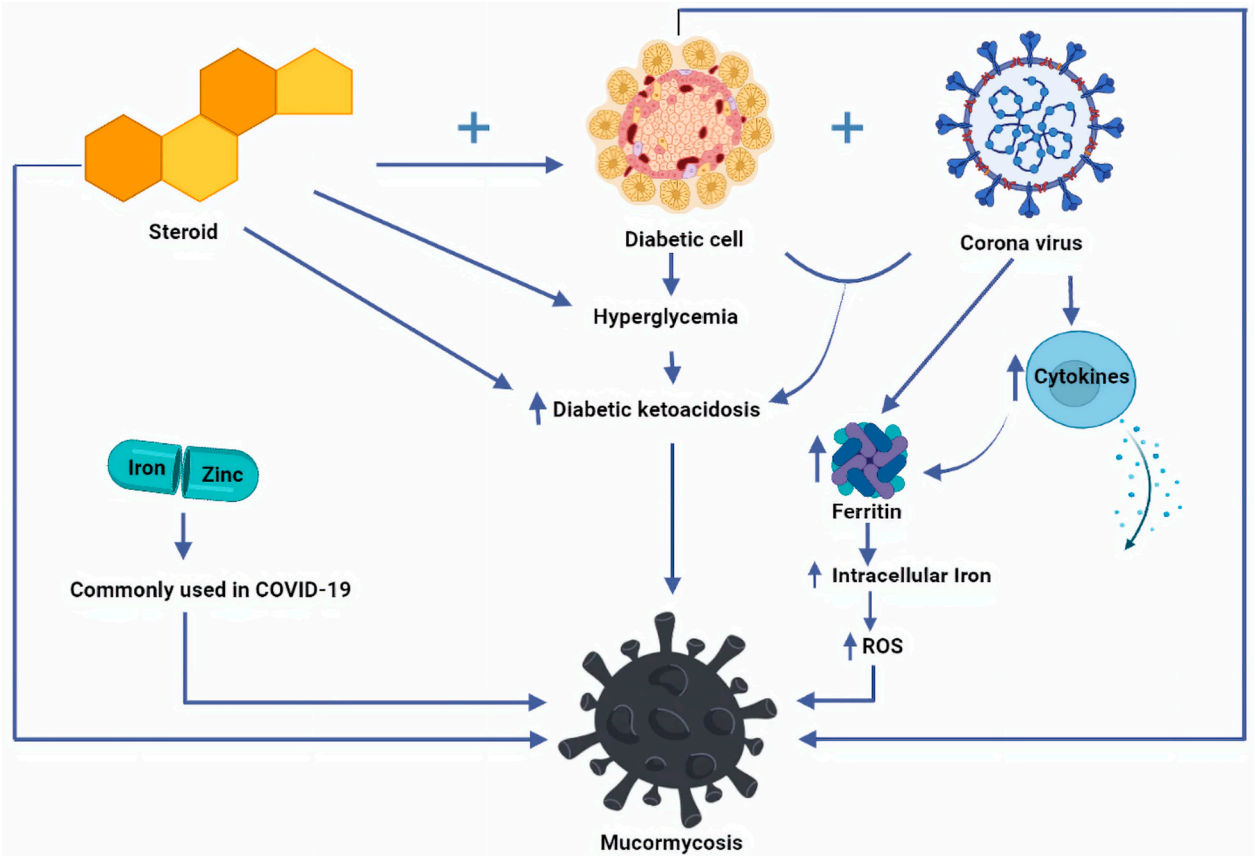

Figure 2. Pictorial representation of etiopathogenesis of mucormycosis in COVID-19 patients.

4.2. Platelets

Platelets play an essential function in enhancing host immunity [46] and exhibit antifungal and antibacterial functions after exposure to an invading pathogen: Anti-inflammatory and pro-inflammatory cytokines and chemokines, including transforming growth factor and fungicidal thrombocidins, are released in granules [47]; platelet Toll-like receptors and CD154 are membrane-bound molecules that allow platelet binding and activation of different cells [48,49]; and adhesion to Mucorales hyphae and spores causes platelet activation, promotes platelet aggregation and clotting, as well as fungal destruction, by inhibiting hyphal development, supporting the development of clots and causing platelet consumption (Figure 3) [50,51]. Fungi may also be prevented from spreading hematogenously by platelet aggregation and adherence to the fungal wall [49]. Necrotic areas were discovered in tissues with no obvious fungal development, implying that thrombotic ischemia occurred due to systematic platelet activation [50]. Patients with COVID-19 who have the severe form of the disease frequently develop clots in vital organs, which can lead to further complications. As a result, the progression of mucormycosis is quite rapid.

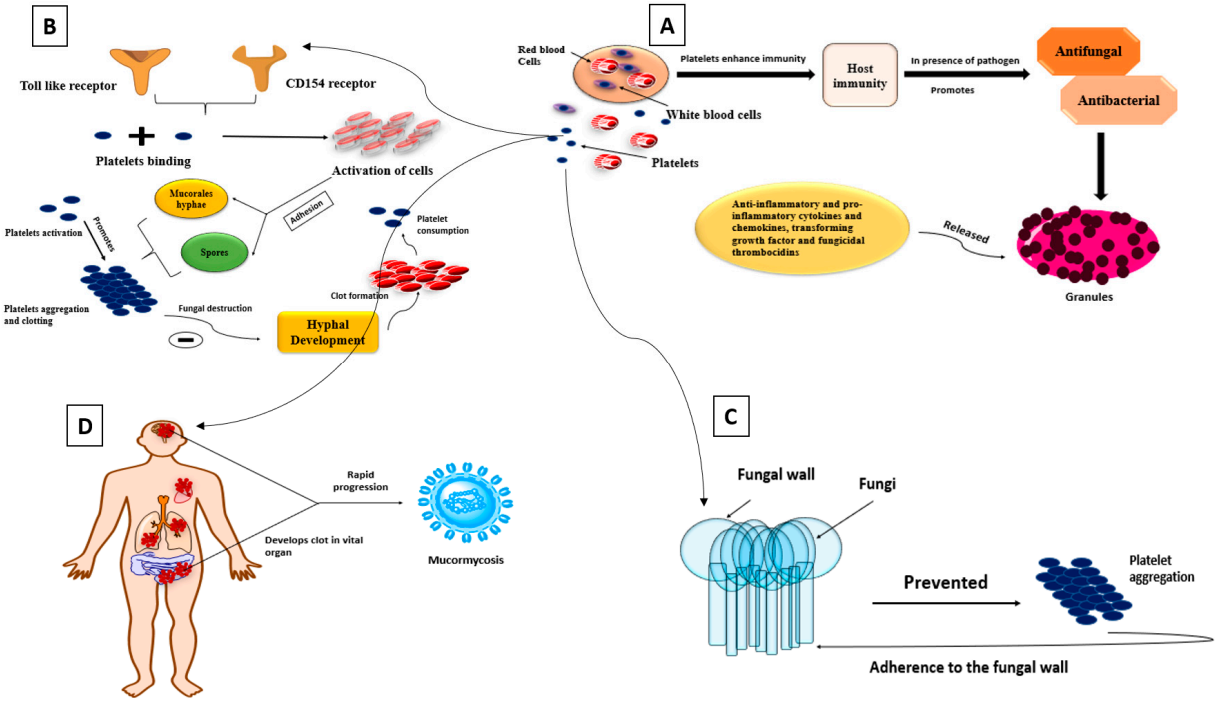

Figure 3. Schematic diagrams of platelets roles; (**A**) Platelets enhance host immunity, and after invading pathogen/foreign matter it promotes antifungal and antibacterial properties. Thus, various cytokines and chemokines released in granules; (**B**) The two membrane bound molecules such as TLR and CD154, it allows platelets binding and activates different cells. Thus, adhesion of mucorales hyphae and spores takes place, which causes platelets activation and leads to aggregation and clotting. Furthermore, inhibits hyphal development in presence of fungal destruction, which leads to clot formation and platelets consumption; (**C**) Prevention of fungi takes place due to the presence of platelet aggregation and therefore, it adheres to fungal wall; (**D**) COVID-19 patient develops clot in their vital organ and therefore progression of mucormycosis becomes rapid.

4.3. Natural Killer Cells

Natural killer cells are a type of innate immune cell that have both direct and indirect cytotoxic effects on the fungi. They also produce cytokines and chemokines such as GM-CSF, TNF-α, and IFN-γ, which influence the activity of other immune cells. Mucorales hyphae can be damaged by natural killer cells, but conidia are unaffected. Moreover, the damage done is inversely proportional to the amount of fungal biomass and has nothing to do with fungal infection. Conversely, in vitro investigations have shown *R.*

oryzae to have an immunosuppressive effect, inhibiting the release of immunoregulatory chemokines RANTES (CCL5) and IFN-γ from natural killer cells [52]. Human natural killer cells are studied for their ability to minimize exacerbations and enhance event-free periods in hematopoietic transplant patients, and their therapeutic effect may also be helpful in managing and providing therapy for invasive mucormycosis (Figure 4) [53,54]. COVID-19 IgG immunity can be severely impaired by high natural killer cell numbers. Antibody-coated virus-infected cells interact with CD16 on natural killer cells, resulting in antibody-dependent cellular cytotoxicity [55]. The innate immune system controls immunological response and acts as a first line of defense against COVID-19.

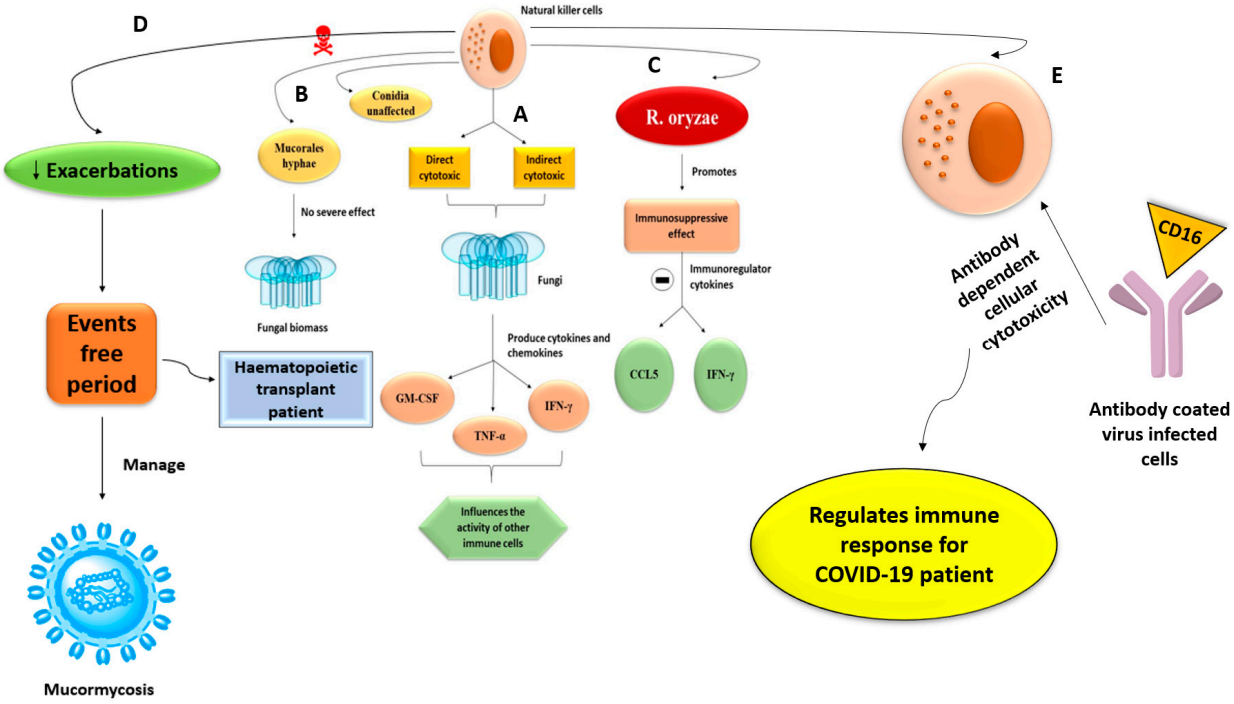

Figure 4. Schematic diagrams of natural killer cells roles; (**A**) Natural killer cells have direct and indirect cytotoxic effects on fungi and produce cytokines and chemokines (includes GM-CSF, TNF-α, IFN-γ. Thus, influences the activity of other immune cells; (**B**) Damage of mucorales hyphae takes place in presence of natural killer cells, but no effects shown in conidia. Therefore, it leads to no fungal infection; (**C**) *R. oryzae* promotes immunosuppressive effects and thus, it inhibits the release of immune regulatory chemokines such as CCL5 and IFN-γ; (**D**) Human natural killer cells are studied for their ability to minimize exacerbations and enhance event-free periods in hematopoietic transplant patients, and their therapeutic effect may also be helpful in managing and providing therapy for invasive mucormycosis; (**E**) Natural killer cell counts can be severe to the IgG immunity for COVID-19. The involvement of CD16 on natural killer cells by antibody-coated virus-infected cells results in antibody-dependent cellular cytotoxicity, thus regulates immune response for COVID-19 patient.

4.4. Iron Uptake

The fungus undergoes apoptosis in iron-deficient circumstances, supporting iron's necessity for fungal cell growth [54]. In animal models of mucormycosis, increased iron concentrations also aid fungal development by reducing phagocyte function and lowering IFN-γ secretion [56]. Mucorales obtain iron from their hosts via two major mechanisms: high-affinity iron permeases or siderophores [57]. In addition, genetic investigation of *R. oryzae* revealed the existence of two copies of heme oxygenases, implying a third mechanism of iron acquisition from hemoglobin [58]. The COVID-19 virus may target haemoglobin, causing iron to be released from porphyrins and into the circulation, resulting in iron overload. Ferritin production is increased to compensate for the high iron level. Increased serum ferritin levels can promote hepatic cell death, causing ferritin to release iron, resulting in greater levels of systemic free iron [59]. As a result, it promotes the spread of fungal infection. Deferoxamine, an iron chelator used in those at risk of iron overload, increases

mucormycosis susceptibility [60]. Mucorales use ferrioxamine (the iron-rich form of deferoxamine) as a xenosiderophore to collect iron [61]. Various researchers have demonstrated that iron chelation therapy with deferasirox or deferiprone prevents mucormycosis in mice with diabetic ketoacidosis and promotes longevity, whereas adjunctive deferasirox was both effective and tolerated in an open-label study of eight cases of mucormycosis [62,63]. Deferasirox also countered iron's inhibitory effect on neutrophil chemotaxis [64]. However, recent clinical research in individuals who had mucormycosis that used supplementary deferasirox medication failed to establish a survival effect [65]. FTR1, a high-affinity iron permease that facilitates iron absorption, is upregulated in an iron-depleted state and silenced in iron-rich situations [66]. It has been proposed that FTR1 facilitates the intracellular transfer of iron from ferrioxamine or heme. An experimental investigation demonstrated that anti-FTR1 antibodies protected mice with diabetic ketoacidosis from infection, highlighting its potential as a therapy target (Figure 5) [67].

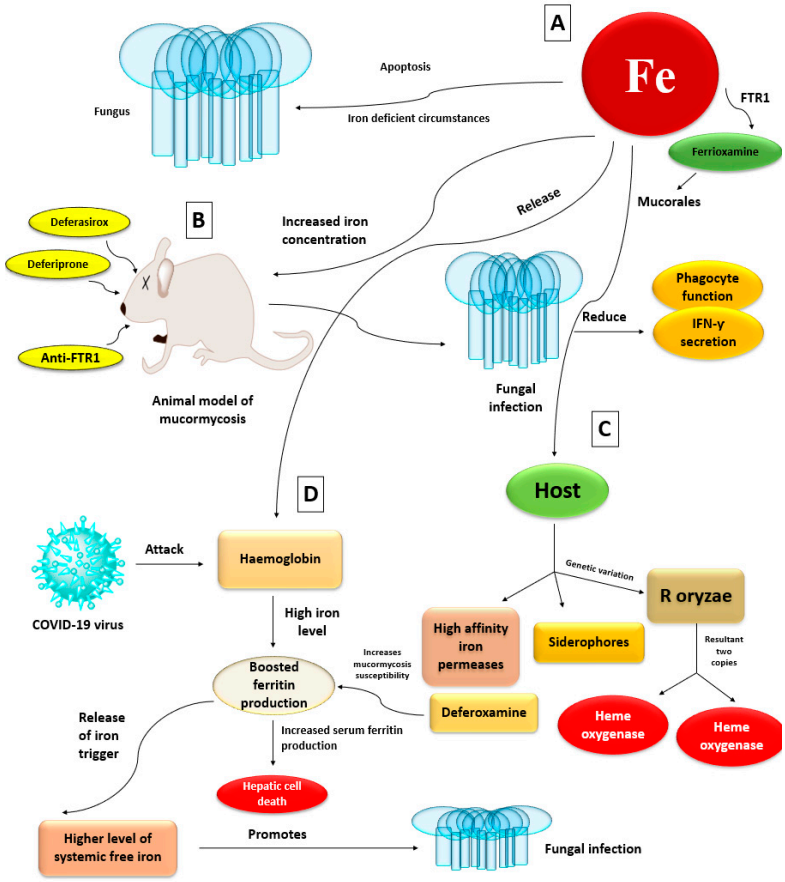

Figure 5. Schematic diagrams of Iron uptakes roles; (**A**) Higher level of Iron (Fe) leads to fungal growth, whereas fungal undergoes apoptosis in iron deficient circumstances; (**B**) Increase level of iron in animal model cause fungal infection, due to the reduction of phagocyte function and IFN-γ; (**C**) In the host body the Mucorales obtain iron via three mechanisms: High affinity iron permeases, siderophores and *R. oryzae*. The *R. oryzae* promotes the existence of two copies of hemeoxygenases; (**D**) COVID-19 virus attack haemoglobin and in the presence of higher level of iron it boosted ferritin production, which leads to the increase serum ferritin production and causes hepatic cell death. Therefore, release of iron trigger and leads to higher level of systemic free iron and cause fungal infection. Thus, various drugs show beneficial effects in the management of Mucorales such as deferasirox, deferiprone ferrioxamine and anti-FTR1.

4.5. Interplay with the Endothelium

Mucorales bind to the surface of the endothelial cells by releasing proteins known as spore coat homologs [68], which are present only in Mucorales and interact with the host

endothelium receptor GRP78, causing the fungus to endocytose [41,68]. GRP78, also known as heat shock protein, is found mainly in the endoplasmic reticulum and is presumed to become a specialized host cell receptor [60]. Spore coat homolog protein fungal surface expression and GRP78 endothelium surface expression increase after endothelial cells are confronted with acidosis, high glucose, and high iron levels, as in diabetic ketoacidosis high blood sugar. Thus COVID-19 patients with diabetes comorbidities can increase fungal endocytosis through the endothelium. In one study, GRP78 and spore coat homolog proteins were elevated by acidosis induced by β-hydroxybutyrate (a ketone body) but not affected by higher blood iron levels lactic acidosis. Furthermore, sodium bicarbonate recovered acidosis and protected β-hydroxybutyrate–treated mice from developing mucormycosis, indicating the importance of restoring acidosis as a therapeutic strategy in patients with mucormycosis and diabetic ketoacidosis. Anti-spore coat homolog protein and anti-GRP78 antibodies were used in another investigation to largely prevent *R. oryzae* endothelium invasion [43].

4.6. Voriconazole Exposure

Clinically relevant epidemiologic data reveal that voriconazole is an antifungal commonly used for prophylaxis in high-risk patients but is ineffective against Mucorales [69]. Voriconazole caused hypervirulent Rhizopus and Mucor strains in mice, increasing lung fungal loads and shortening lifespans [43]. The hypervirulent phenotype was lost when voriconazole treatment stopped, indicating an epigenetic rather than a genetic shift [70]. Voriconazole is currently recommended as first-line therapy for COVID-19 associated pulmonary aspergillosis (CAPA), which can lead to the fast spread of mucormycosis [71]. A recent investigation using rat models found that pre-exposure of fungal spores to voriconazole produces breakthrough infections by *R. oryzae*, which appear to be less responsive to subsequent antifungal therapy [72]. If voriconazole exposure does indeed select for more virulent strains, then we may be only beginning to understand the processes that contribute to Mucorales pathogenicity.

5. Mucormycosis Outbreak

An outbreak occurs when two or more people are infected by the same source or at the same place or time. The sources of outbreaks may be outdoors or may be in a healthcare setting, such as a hospital [73]. Most published works describe outbreaks of cutaneous mucormycosis, which has been tied to contaminated dressings and is less fatal than other forms of mucormycosis, with a medical literature review revealing 16% mortality versus 67% for rhinocerebral, 83% for pulmonary, and 100% for disseminated and gastrointestinal mucormycosis [74]. Hospital bedding has been identified as a vector for spreading *R. delemar* to vulnerable patients. In hospital epidemic investigations, DNA-based approaches to fungal species detection have confirmed epidemiological connections. Hospital bedding must be washed, wrapped, distributed, and stored in ways that minimize their exposure to environmental pollutants [75].

6. Effects of Black Fungus on COVID-19 Patients

The outbreak of mucormycosis is yet another unpleasant surprise brought on by the COVID-19 pandemic [76]. It can infect the sinuses and facial bones, infiltrate the brain, and lead to the loss of an eye. If left untreated, mucormycosis kills up to half of patients—and treatment is time-consuming and difficult. The standard treatment approach for severe COVID-19 is a high dose of steroids, antibiotics, and antivirals, which dampen the immune system and make the patient susceptible to infection by bacteria and fungus already present in the body or the environment [77]. Infection with mucormycosis is akin to opening Pandora's box. Having been infected by SARS-CoV-2, the patient's body is already ravaged, and infection by a virulent fungus often leads to death.

To save a patient's life, doctors may surgically remove an organ or tissue from the body, causing emotional anguish for the patient and family members. Moreover, the standard

treatment for black fungus is Amphotericin B, which is exorbitantly expensive, to the point that insolvency may arise from treatment [78].

7. Diabetes Patients Are Predisposed to Mucormycosis

Diabetic ketoacidosis and deferoxamine-treated individuals are prone to mucormycosis in a unique way. Diabetic individuals have a high glucose level in their blood [79]. Excessive glycosylation of proteins like ferritin and transferrin might cause them to lose their iron affinity, which further induces hyperglycemia [80]. Furthermore, when there is an acidic state in the blood vessels owing to the build-up of ketone bodies (e.g., β-hydroxybutyrate), transferrin's potential to chelate iron is severely impaired [81]. β-hydroxybutyrate, glucose, and iron promote fungal development (Figure 6) [56,82]. They also increase the expression of spore coating protein (CotH) and glucose regulator protein78 (GRP78), which leads to increased fungal invasion and consequent endothelial damage in-vitro [70,82]. β-hydroxybutyrate related acidosis appears to have a direct influence on CotH and GRP78 expression (an effect not observed with lactic acid) as well as an indirect effect on transferrin's potential to chelate iron, as iron chelation coupled with sodium bicarbonate pH reversal substantially protects endothelial cells against Rhizopus-mediated invasion and damage [82]. Notably, when mice administered with β-hydroxybutyrate or diabetic ketoacidosis mice have shown lower blood pH, higher accessible serum iron, higher GRP78 expression in target organs (e.g., sinuses and lungs), they are more vulnerable to mucormycosis [56,82]. It is also important to highlight that optimum levels of β-hydroxybutyrate, iron, and glucose facilitate fungal growth while suppressing the host immune response via phagocyte-mediated destruction, IL-γ generation, and T-lymphocyte activation (Figure 6) [56,82–85]. Thus, the particular propensity of diabetic ketoacidosis patients to mucormycosis is explained by the idiosyncratic interactions of CotH and GRP78 proteins, as well as their increased expression under hyperglycemia and ketoacidosis conditions [58]. Therapeutic intervention with either anti-CotH or anti-GRP78 antibodies protects neutropenic and diabetic ketoacidosis mice against mucormycosis, highlighting the significance of CotH/ GRP78 protein interactions in the pathophysiology of mucormycosis [69,70,85].

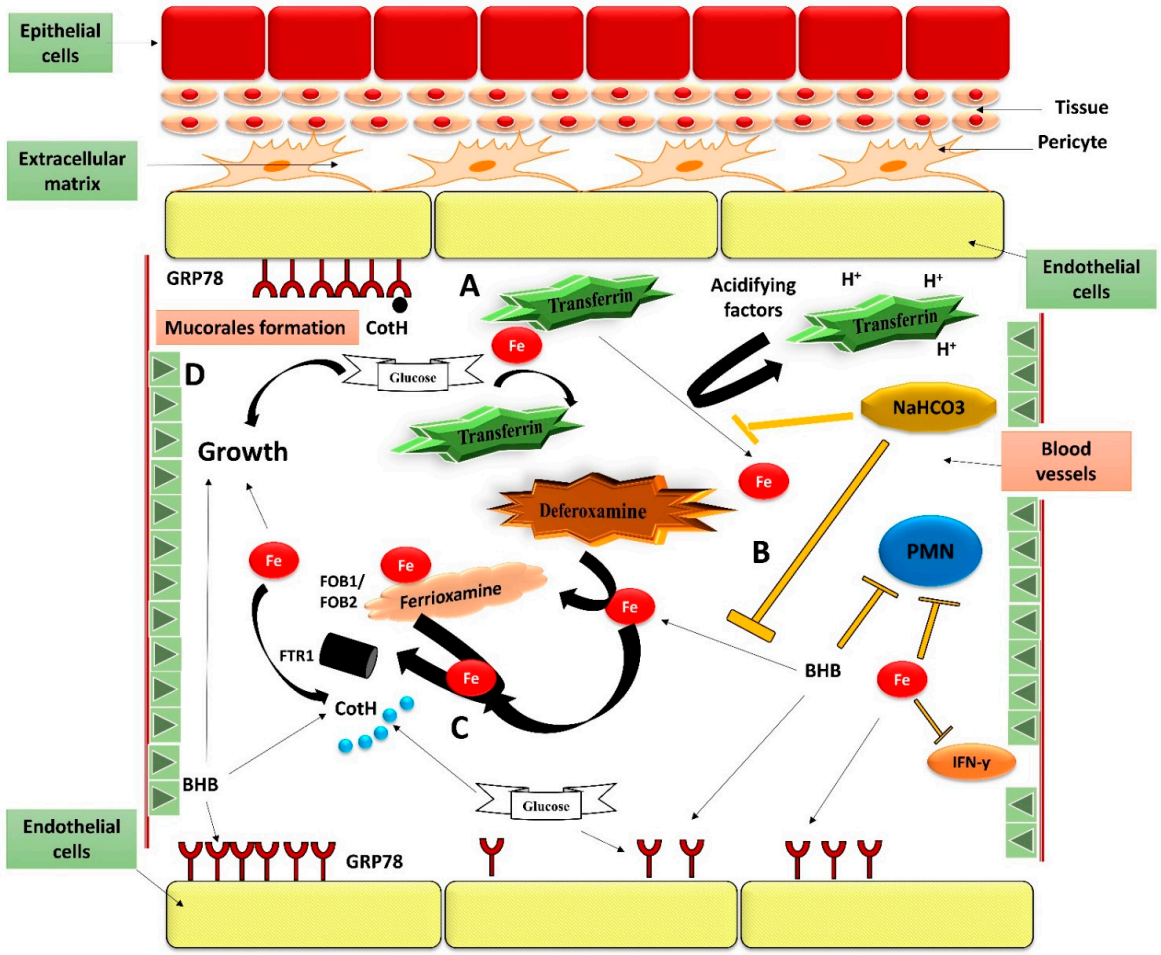

Figure 6. Interaction between Mucorales and endothelial cells during hematogenous proliferation, as well as the influence of host attributes on these relationships and the immune response. (**A**)—Through glycosylation and protonation, hyperglycemia and ketoacidosis trigger the production of Fe from transferrin.; (**B**)—Immunological response to disease is harmed by BHB and free Fe, but at the other end, NaHCO3 counteracts this damaging activity by decreasing transferrin iron release and mitigating acidity.; (**C**)—GRP78 expression on vascular endothelium significantly increased in response to the stressors caused by free Fe, hyperglycemia and ketone substances.; (**D**)—Free Fe, glucose and BHB increase the production of CotH in fungal cells, resulting in endothelium invasion and increased fungal growth.

8. Implement Control and Preventive Measures

Mucormycosis is an aggressively growing infection that follows infection by COVID-19. Its radiographic manifestations are not specific, but diagnosis can be made by microscopic examination of materials collected from necrotic lesions. Treatment requires multidisciplinary expertise, as the fungus enters through the eyes and nose and can even reach the brain [86]. It can be treated or controlled (1) medically, by using antifungal therapies; (2) surgically, by removing all necrotic lesions; or (3) by implementing adjunctive therapies that reverse the risk factors [87].

9. Medical Management of Mucormycosis

9.1. Management by Using Antifungal Drug Therapies

The lipid formulation of amphotericin-B (liposomal Am-B) is the first-line treatment for mucormycosis in COVID-19 patients. Injection of liposomal Am-B, with a starting dosage of 5–7.5 mg/kg/day, diluted in 500 mL of 5% dextrose over 4–5 h for 14–21 days, is commonly used in hospitalized adults and children [88]. Patients who are intolerant of or unresponsive to Am-B can be given alternative agents, such as an oral suspension of posaconazole, 400 mg two times a day or 200 mg four times a day. However, posaconazole alone cannot

be recommended as a primary treatment in patients who have mucormycosis [89]. With progressive infection, monotherapy using lipid Am-B, increasing liposomal Am-B dosage (7.5–10 mg/kg per day), addition of posaconazole or an echinocandin, and shifting to posaconazole are viable strategies for treatment [90]. The evidence does not support combination therapy for first-line healing of mucormycosis, but if first-line therapy fails, a salvage therapy combining a polyene and an echinocandin can be used [89].

Liposomal Am-B is considered an efficient treatment for mucormycosis. Amphotericin B binds to ergosterol present in the fungal cell membrane, which causes pores and subsequent ion leakage, followed by the death of the fungal cells. Several studies have demonstrated the in vitro and in vivo binding of liposomes (both amphotericin B loaded liposomes and empty liposomes) to pathogenic fungal cell walls with gold and fluorescent-labeled liposomes [91–93]. As long as a liposome does not have Am-B, it binds to the fungus's cell wall, but both the fungus cell and liposome stay intact. Liposomes containing amphotericin B, however, are capable of killing fungal cells, which implies that the binding causes the liposome to rupture and release amphotericin B. It then binds to ergosterol in the fungus cell membrane, exerting its fungicidal effect [91]. However, the exact mechanism of how amphotericin B crosses the fungal membrane from the liposome is still unclear. As ergosterol is the primary lipid component of the liposome, amphotericin B likely has a higher affinity for it than cholesterol [94]. As a bonus, liposomal Am-B formulations penetrate biofilms far better than conventional Am-B [95,96]. Despite the excellent pharmacokinetic and pharmacodynamic activity of liposomal Am-B, doctors are shifting towards surgery to save the life of patients because of the poor pharmacoeconomic status of liposomal Am-B. High cost and low availability in the market can be the only limitation of liposomal Am-B [90]. Liposomal Am-B will be called the standard gold drug for treating mucormycosis in COVID-19 patients if such limitations are resolved.

Isavuconazole is the first triazole drug approved by the U.S. Food and Drug Administration (FDA) to treat mucormycosis. It inhibits the CP450-dependent 14-lanosterol demethylase in the fungal cell membrane. As a result, cytotoxic sterols accumulate and reduce ergosterol production, which is essential for fungal cell membrane development. It inhibits fungal growth and replication, eventually leading to cell death [97].

The major drawback of this drug is its resistance like other azoles. Resistance occurs after repeated exposure to the drug. Azole resistance mechanisms include overexpression of ABC transporters (ATP binding cassettes), mutation of the gene encoding the target enzyme (ERG11), ERG3 gene mutation which impairs azole-mediated cell membrane disruption [98]. Therefore, it is a reasonable treatment option for mucormycosis patients with other refractory disorders and posaconazole intolerance [99].

Azoles primarily target ergosterol, which ensures membrane fluidity, permeability, and the proper functioning of membrane proteins [100]. It primarily works by inhibiting ergosterol biosynthesis via the fungal cell membrane's CP450-dependent 14α-lanosterol demethylase, which is responsible for converting lanosterol to ergosterol. Consequently, the integrity of the fungal cell membrane gets altered, affecting its morphology and growth, eventually leading to cell death [101].

9.2. Surgical Management

The high cost and low availability of liposomal Am-B have prompted doctors to conduct surgeries to save the life of patients [90]. Surgical debridement to remove all necrotic lesions remains the hallmark of effective treatment of mucormycosis in COVID-19 patients. Extensive surgery should be conducted as early as possible, with an MRI or CT scan used preoperatively to determine the extent of the tissues in question and the involvement of tissue margins. Repeated surgical removal of necrotic lesions has shown improved outcomes. After successful treatment, the patient may undergo plastic surgery [90]. Surgical recommendations differ by site and by the severity of the condition. Table 1 shows the mode of action, advantages and disadvantages of various medications, as well as surgical management for mucormycosis infection healing.

Table 1. Demonstrated mode of action, advantages and disadvantages of various medications, as well as surgical management for mucormycosis infection healing.

Treatment Protocol	Mode of Action	Advantages	Disadvantages	Ref
Therapeutic Intervention				
Lipid formulation of Amphotericin B (Polyenes derivatives)	The cellular membrane is substantially targeted by Amphotericin B loaded liposomes, which induce fungicidal activity by binding to ergosterol in the fungal cell membrane	➢ Amphotericin B lipid formulations have a higher therapeutic index ➢ Least nephrotoxic, and have better CNS penetration than amphotericin B deoxycholate ➢ Used as first-line treatment for mucormycosis	➢ Hepatotoxicity, infusion-related toxicity ➢ Broad use is limited by the expensive cost and requirement for parenteral administration	[89,102,103]
Posaconazole with or without lipid polyenes (Triazoles derivative)	Inhibits fungal lanosterol 14 α-demethylase enzyme synthesis	➢ Posaconazole oral dosage is simple and convenient ➢ 60–70% success rates were found in a retrospective case study (complete plus partial response) ➢ Posaconazole is an off-label medication for mucormycosis in people who are resistant to amphotericin B	➢ In murine model, the effectiveness of Posaconazole monotherapy was lower than that of polyenes ➢ Posaconazole oral suspension has a reduced absorption rate	[104,105]
Isavuconazole (A new broad-spectrum triazoles derivatives)	Cytochrome P450-dependent lanosterol 14-demethylase enzyme, which is required for the production of ergosterol, a component of the fungal membrane, is inhibited by isavuconazole	➢ High oral absorption; less drug-drug interaction; no need for therapeutic drug monitoring; and linear pharmacokinetics ➢ Isavuconazole has a wide range of fungicidal activity and a low risk of side effects	➢ Hepatotoxicity properties limited the use of Isavuconazole ➢ Isavuconazole has a limited number of clinical studies	[106–109]
VT-1161	Potent inhibitor of CYP51 and possess in-vitro activity against *Mucorales*, including *Cunninghamella*, *Lichtheimia*, and *Rhizopus oryzae*	➢ It prevented *Rhizopus delemar* infection in immunocompromised mice, and possess modest in-vitro activity against *Mucorales* ➢ VT-1161 has a lower toxicity potential than existing azoles and polyenes, as well as better pharmacokinetics ➢ VT-1161 increased dose-dependent drug plasma levels as well as increased survival rates.	➢ VT-1161 is expensive	[110]

Table 1. *Cont.*

Treatment Protocol	Mode of Action	Advantages	Disadvantages	Ref
APX001A	The inositol acyltransferase suppressed by APX001A, which limits the development of Glycosylphosphatidylinositol-anchored proteins and producing antifungal effect	➢ Contribute a significant role in the controlled of infectious illness	➢ APX001A has a limited number of clinical studies	[111,112]
Caspofungin plus lipid polyene	Inhibit the enzyme β-1,3-D-glucan synthase	➢ Synergistic in murine disseminated mucormycosis; and favorable toxicity profile	➢ Very limited clinical data of combination therapy	[113,114]
Anidulafungin plus lipid polyene	Inhibit the enzyme β-1,3-D-glucan synthase.	➢ Synergistic with liposomal amphotericin B in murine model of disseminated mucormycosis; and favorable toxicity profile	➢ No clinical data	[115]
Deferasirox plus lipid polyenes	Reducing the available iron load and thus inhibiting the fungal growth and lack siderophore capability	➢ Success in case report and deferasirox oral dosage is simple and convenient	➢ Limited clinical data	[62,116]
Surgical Intervention				
Rhino-orbito- cerebral infection; Soft tissue infection; and localized pulmonary lesion	A critical component of effective therapy is prompt surgical debridement, which should be repeated if required. When surgery is required and feasible, it must be robust. Because the Mucorales hyphae may spread infection swiftly, it is important to remove not just necrotic tissues but also infected healthy-looking tissues in the surrounding area.	➢ Significantly increase the survival and success rate	➢ Expensive	[117–119]

10. Adjunctive Therapies

Along with antifungal agents and surgeries, adjunctive therapies involving reversal of immunosuppression, correction of metabolic deficits, and strategies for immune augmentation are beneficial for controlling mucormycosis [120]. Popular adjunctive therapies include hyperbaric oxygen, immunomodulation strategies, and iron chelation [89]. Hyperbaric oxygen, which is an effective treatment for diabetic patients who have rhinocerebral or severe cutaneous mucormycosis [121], increases the partial pressure of oxygen and improves neutrophilic function. High oxygen concentrations also improve wound healing by releasing enhanced tissue growth factors [122]. However, such therapy has not been subjected to detailed study and so is not regularly recommended. Accordingly, immune augmentation strategies such as granulocyte colony-stimulating factor (G-CSF) and interferon-γ have been implemented as adjunctive therapies to improve host response [123]. Iron chelators such as deferasirox and deferiprone have also been shown to prevent fungal growth and protect diabetic mice from developing mucormycosis. Case reports indicate that iron chelation therapy is a beneficial adjunctive therapy in diabetic patients, whereas a small double-blinded, placebo-controlled, multi-centered study of 20 patients who had a hematologic disorder showed adverse effects when adding deferasirox to liposomal Am-B. Although the study size was limited, the data did not support a role for deferasirox as an adjunctive therapy [124].

11. Preventive Measures

The Indian Council of Medical Research (ICMR) has released a set of general guidelines for mucormycosis prevention in COVID-19 patients [125]:

- Good control of sugar level during COVID-19 with or without use of steroids
- Rational use of steroids in the correct dose, with proper timing, and for a suitable duration
- Judicious use of antibiotics/antifungals
- Use of sterile or clean water as humidifiers during oxygen therapy

Additionally, modest preventive actions are indicated for post–COVID-19 recovery patients to avoid mucormycosis:

- Maintaining personal hygiene by thoroughly bathing and scrubbing the body
- Wearing face masks and face shields while visiting dirty or polluted environments
- Wearing concealed shoes, long trousers, long-sleeved shirts, and gloves while handling soil, manure, moss, and the like (especially while gardening)

Because the literature lacks sufficient data on measures for preventing mucormycosis in COVID-19 patients, healthcare professionals follow such general environmental infection control measures to prevent mucormycosis in COVID-19 patients.

Apart from these strategies for managing and preventing mucormycosis in COVID-19 patients, the Ministry of Ayurveda, Unani, Siddha, and Homeopathy (Ayush) in India has suggested different preventive medicines to patients who have recovered from COVID-19 and to those who are on high doses of steroids and are diabetic [126]. The Ministry of Ayush has claimed that ayurvedic formulations can help control black fungus disease among COVID-19 patients, with Unani and homeopathic medicines useful in preventing and treating mucormycosis in COVID-19 patients [127].

12. Nanoparticle Formulation of the Drug/Nanoformulation of the Antifungal Drugs

Mucormycosis occurs worldwide, producing severe morbidity and mortality in COVID-19 and other immunocompromised patients. Many efficient antifungal medications are on the market, but their effectiveness is constrained by resistance and considerations of toxicity. Nanoparticles can overcome such limitations by reducing toxicity and increasing bioavailability. Use of nanotechnology for antifungal therapy began in the 1990s with the launch of a lipid formulation of amphotericin B (Am-B) [128]. Apart from the lipid formulation, alternative formulations such as Am-B colloidal dispersion and liposomal Am-B are available [129] and have been found to be safe and effective compared with conventional

Am-B. Traditional Am-B is typically prepared as a colloidal suspension for parenteral delivery with sodium deoxycholate, but renal toxicity and severe infusion-related problems hamper its therapeutic efficacy [130,131]. Nanoformulations significantly reduce the toxic effect of the drug but are highly expensive and are available only in parenteral form, limiting their widespread use even apart from the deleterious effect of COVID-19 on personal finances. At 6000–8000 INR, a vial of liposomal Am-B is out of reach of ordinary people, so development of a cost-effective antifungal nanoformulation is an active area of research. Several nanosystems for oral, topical, vaginal, ocular, and pulmonary delivery of Am-B are currently under development and have shown promising in vitro results [132]. Disappointingly, however, only the nano form of Am-B has completed clinical trials. Research into delivery of antifungal medications should address the challenges to clinical translation of nanoparticle-based formulations so that diseases such as mucormycosis and COVID-19 can be combated [133].

13. Earlier Diagnose Mucormycosis to Overcome the Adverse Effect

Diagnosing mucormycosis appropriately and undergoing the necessary tests is fundamental to the success of the treatment. Patients with malignant hematological conditions whose amphotericin B-based therapy is delayed beyond the first five days of symptoms have double the 12-week mortality rate [132]. Early diagnosis is therefore crucial to ensuring effective treatment in people with mucormycosis [134,135]. Mucormycosis is currently diagnosed mostly through the culture of the organism from generally sterile body locations and/or histopathologic examination of the affected tissue [89,136]. Medium such as Sabouraud-dextrose agar can be used to isolate mucorales, and the fungal invasion can be investigated using methenamine-silver, eosin, and hematoxylin, calcofluor white stain or periodic acid-Schiff [137]. However, these techniques do not provide enough sensitivity, and end up leading to wrong diagnosis. Computed tomography (CT) can be used to detect pulmonary mucormycosis earlier in cancer patients. In the absence of airway-invasive characteristics, a reversed halo sign can aid in distinguishing the condition from invasive pulmonary aspergillosis in patients with a hematologic malignancy or neutropenia [138]. Radiological indicators of disease are frequently suggestive, rather than diagnostic. Recent development in molecular diagnostic technologies, such as the advent of polymerase chain reaction (PCR)-based tests, along with Matrix Assisted Laser Desorption/Ionization-Time of Flight Mass Spectrometry (MALDI-TOF MS), may assist in the earlier diagnosis of mucormycosis as well as the commencement of treatment [139,140].

14. Mucormycosis Diagnosis Limitations in Patients Infected with Microbial Infection

Given the limited treatment choices available, which usually include disfiguring and painful operations, early and accurate diagnosis is, in theory, the most important factor in improving the outcome of mucormycosis. Furthermore, approximately 4 to >90% of suspected mucormycosis cases are not verified until post-mortem investigation [141–143]. A combination of variables, the non-specific clinical appearance of mucormycosis, as well as the various limitations of currently available diagnostic techniques, make a definite diagnosis challenging. It is critical to isolate the fungus and identify it to the genus or species level for prognostic, epidemiological, and therapeutic objectives. [142,144,145]. The cultural isolation output ranges from 50–71%, with evidence that it has improved considerably over time [37,141]. Mucorales recovery from clinical microbiology specimens, on the other hand, is difficult. Mucorales hyphae may be difficult to see on wet mounts and require special chitin-binding stains to be seen using a fluorescence microscope, or they may be too few to see. Furthermore, vigorous homogenization or tissue grinding may obliterate the coenocytic hyphae during tissue processing [142,146]. Nonculture techniques, such as detecting biochemical or serological indicators, are currently unavailable to aid in diagnosing invasive mucormycosis. Invasive candidiasis is diagnosed using circulating mannan antigen and (1-3)-β-D-glucan, whereas invasive aspergillosis is diagnosed using galactomannan in bronchoalveolar fluid and serum.

15. Future Perspective

Mucormycosis infection is unpleasant, debilitating, and fatal. It leads to loss of organs and emotional trauma in patients, lowering quality of life, and treatment is prohibitively expensive. Amid the COVID-19 outbreak, prevention is of the utmost importance, as is ensuring the availability of an efficient, cost-effective treatment. Despite significant progress in understanding the microbiological aspects of this infection, the COVID-19 outbreak has underscored the need for more awareness, improved diagnostic tests, a focus on diabetes control, and prudent use of corticosteroids, with patients requiring immediate surgery and antifungal treatment. Further research into using modern tools and approaches to prevent and treat this infection is required, along with exploration of novel ways of delivering antifungal drugs that can increase their therapeutic efficacy.

16. Conclusions

Fungal infections subsequent to COVID-19 have been observed so extensively in many countries that doctors are beginning to design therapeutic strategies to counteract their effects. Fungal spores are everywhere, but human lungs are generally efficient at clearing them out. However, COVID-19 causes lung damage, diminishing the capacity to naturally eliminate spores in patients who are suffering a weakened immune response as a result of steroid treatment. People who have uncontrolled diabetes are more susceptible to black fungus infection, but the early signs of mucormycosis can be challenging to detect. Unlike some other fungal diseases, it cannot be detected through blood testing. Diagnosis requires a biopsy, examination of the sample, and in some cases a CT scan, all of which require specialized personnel and advanced technology—neither of which can be guaranteed in under resourced areas of India's healthcare system.

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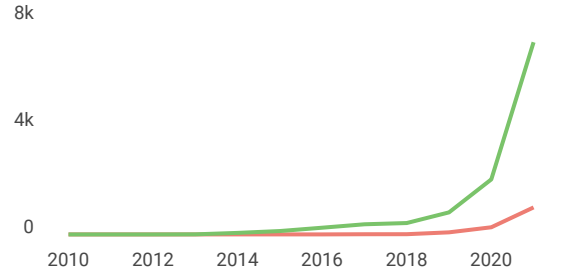

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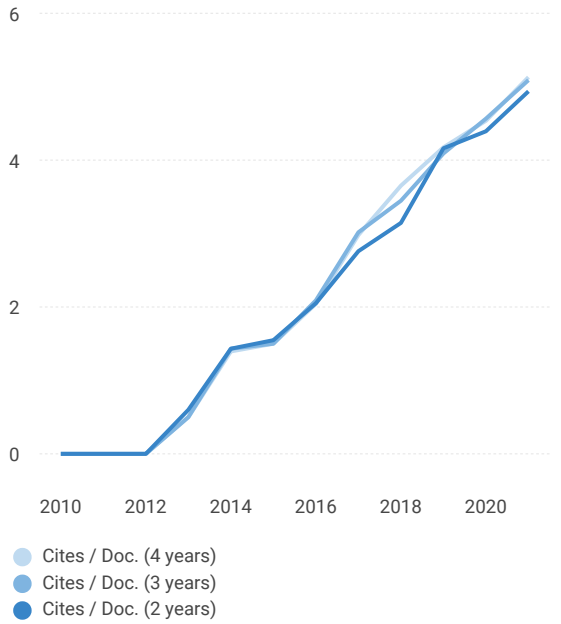

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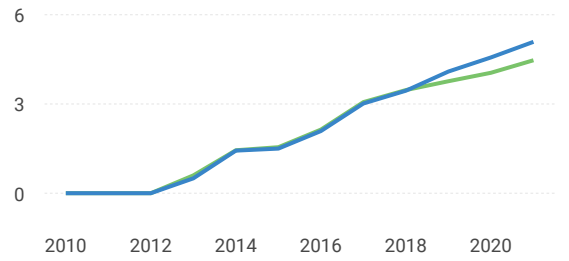

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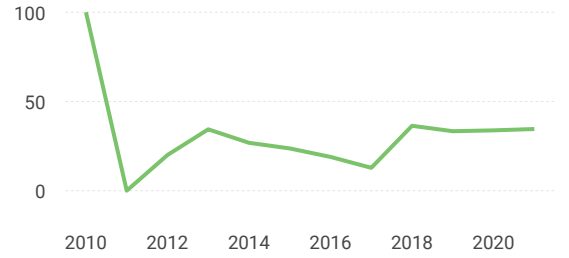

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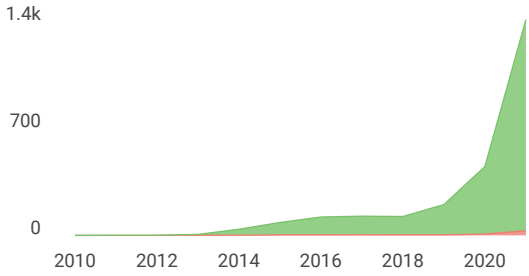

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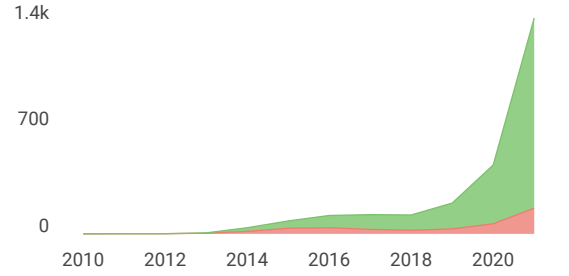

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