READING LIST

(where full articles are not available, you may contact the authors for copies.)

Articles and Information on COVID-19

Free coverage of everything we know about the COVID-19 corona virus. https://cen.acs.org/content/cen/sections/Tracking-the-novel-coronavirus.html?utm_source=Announcement&utm_medium=Member&utm_campaign=CEN; https://pubs.acs.org/page/vi/chemistry_coronavirus_research?utm_source=pubs_content_marketing&utm_medium=email&utm_campaign=0420_MFH_PUBS_0320_MFH_CoronavirusThirdEmail_&ref=pubs_content_marketing

COVID-19 Open Research Dataset (CORD-19), A Free Open Resource for the Global Research Community.
https://pages.semanticscholar.org/coronavirus-research

The Great Influenza: The Story of the Deadliest Pandemic in History
https://www.amazon.com/Great-Influenza-Deadliest-Pandemic-History/dp/0143036491

Microneedle Array Delivered Recombinant Coronavirus Vaccines: Immunogenicity and Rapid Translational Development, *EBioMedicine* , 2020, in press. DOI:10.1016/j.ebiom.2020.102743

A Highly Conserved Cryptic Epitope in the Receptor Binding Domains of SARS-CoV-2 and SARS-CoV. *Science* 3 Apr 2020. Ian A. Wilson group, The Skaggs Inst. for Chemical Biology, The Scripps Research Institute, La Jolla, CA [X-ray crystal structure of SARS patient-derived immunoglobulin binds to an allosteric site (not ACE2 binding site); implications for possible design of neutralizing antibodies]. https://science.sciencemag.org/content/early/2020/04/02/science.abb7269.

Learning from the Past: Possible Urgent Prevention and Treatment Options for Severe Acute Respiratory Infections Caused by 2019-nCoV". *ChemBioChem*, 2020, 21, 730 – 738; provides potential targets and therapeutics for COVID-19 treatment. DOI:10.1002/cbic.202000047

Drug Targets/Lead Molecules to Potentially Treat COVID-19 Virus: *ACS Cent. Sci.* 2020, 6, 3, 315-331. https://doi.org/10.1021/acscentsci.0c00272

Protein Mapping Points to 69 potential COVID-19 Treatments. *C&EN News*, 2020 March 30 issue. Protein mapping points to 69 potential COVID-19 treatments. Many are FDA-approved drugs that could be repurposed.

The FDA-approved Drug Ivermectin Inhibits the Replication of SARS-CoV-2 in Vitro. *Antiviral Research* **2020**, in press. https://doi.org/10.1016/j.antiviral.2020.104787, early release. From Monash University, Wagstaff group. Ivermectin inhibits replication in SARS-CoV-2 infected Vero cells at 5 µM. And I stress, I don't endorse ivermectin as a viable antiviral; it has previously been shown to "limit infection" of several RNA viruses, in vitro, e.g. dengue, influenza, West Nile, but *not* Zika. Very preliminary.

Broad-Spectrum *In Vitro* Activity and *In Vivo* Efficacy of the Antiviral Protein Griffithsin against Emerging Viruses of the Family *Coronaviridae. J. Virology*, 2010, 84 (5) 2511-

2521; **DOI:** 10.1128/JVI.02322-09; https://jvi.asm.org/content/84/5/2511. The lead author is Barry O'Keefe, current ASP President.

Cryo-EM structure of the 2019-nCoV Spike in the Prefusion Conformation *Science,* 2020, 367, Issue 6483, 1260-1263. First cryo-EM of the spike protein S of 2019-nCov (now SARS-Cv-2), with and without its 'gateway' receptor into human cells, ACE2. https://science.sciencemag.org/content/367/6483/1260

Breadth of Concomitant Immune Responses prior to Patient Recovery: a Case Report of Non-severe COVID-19. *Nature Medicine* letter: a day-by-day immunological response from a patient diagnosed with covid-19 from 3 days before admission (*t*= -3) of infection, to admission (*t* = 0) to post-recovery (*t* = 20). https://www.nature.com/articles/s41591-020-0819-2

Are Patients with Hypertension and Diabetes Mellitus at Increased Risk for COVID- 19 Infection? *Lancet* letter: concerns about vulnerability to COVID-19 of patients w/upregulated ACE2 (e.g., treatment with bp-lowering drugs that are ACE inhibitors) DOI:10.1016/S2213-2600(20)30116-8

Natural Products Drug Discovery. The names are given of key authors or ASP Fellows who are corresponding or co-authors for relevant articles.

1 **March 2020 special issue of JNP in honor of Jon Clardy.** The following link provides access to abstracts of all the articles, many of which are authored by ASP members. https://pubs.acs.org/toc/jnprdf/83/3; note two short reviews by colleagues who have worked w/Jon: DOI:10.1021/acs.jnatprod.9b01237 and DOI:10.1021/acs.jnatprod.9b01086

2 Natural Products as Sources of New, Drugs over the Nearly Four Decades from 01/1981 to 09/2019. *J. Nat. Prod.* 2020, 83, 770; DOI:10.1021/acs.jnatprod.9b01285 [Newman&Cragg].

3 Retrospective Analysis of Natural Products Provides Insights for Future Discovery Trends. *PNAS,* 2017, 114, 5601-5606; perspective on where we are, as a field, in NP discovery, in terms of numbers and structural novelty.DOI:10.1073/pnas.1614680114 [Gerwick]

4 Strategies for Optimization of Natural Leads to Anticancer Drugs or Drug Candidates, *Med. Res. Rev.*, **1**, 32-91 (2016). DOI:10.1002/med.21377 [Lead Author: Lee]

5 Natural Product Drug Discovery in the Genomic Era: Realities, Conjectures, Misconceptions, and Opportunities. *J. Ind. Microbiol. Biotechnol*., 2019, 46, 281-299. DOI:10.1007/s10295-018-2115-4 [Lead Author: Baltz].

6 Computational Approaches to Natural Product Discovery. *Nat. Chem. Biol*., 2015, 11, 639-648. DOI:10.1038/nchembio.1884. [Lead Author: Fischbach].

7 Discovery of Microbial Natural Products by Activation of Silent Biosynthetic Gene Clusters. *Nature Rev. Microbiol*., 2015,13, 509-23. DOI:10.1038/nrmicro3496.[Lead Author: Challis]

8 Reinvigorating Natural Product Combinatorial Biosynthesis with Synthetic Biology. *Nat. Chem. Biol.*, 2015, 11, 649–659. DOI:10.1038/nchembio.1893 [Moore]

9 Genetic Platforms for Heterologous Expression of Microbial Natural Products. *Nat. Prod. Rep.*, 2019, 36, 1313-1332. DOI: 10.1039/c9np00025a [Moore]

10 Antibiotics. Natural Products Essential to Human Health. *Med. Res. Rev.*, 2009, 29, 821-842. DOI:10.1002/med.20154 Abstract. A review covering >50 years of antibiotic research by Dr. Demain, a renowned microbiologist, now retired. PDF available from Cragg. More may be found at: https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Demain%2C+Arnold+L Sadly, Dr. Demain passed away on April 3rd after a brief illness caused by COVID-19.

11 Microbial Metabolites: 45 years of Wandering, Wondering and "Discovering". *Tetrahedron*. 2011, **67** (35): 6420–6459 DOI:10.1016/j.tet.2011.03.117.Abstract. A review by Dr. Omura, who shared the Nobel Prize in Physiology or Medicine in 2015 with Drs. Tu and Campbell. (www.nobelprize.org/prizes/medicine/2015/omura/lecture/). He is an ASP Fellow and recipient of the ASP Norman R. Farnsworth Research Achievement Award in 2013. Further details on Dr. Omura's many achievements and publications may be found at http://www.satoshi-omura.info/.

12 Omura Publications: 2015-current www.satoshi-omura.info/publications/2015.html. Dr. Omura has published 86 cutting edge papers on antibiotics since 2015, incl #13 below.

13 Lactacystin: first-in-class proteasome inhibitor still excelling and an exemplar for future antibiotic research. *J. Antibiot.*, 2019, **72**, 189 DOI:10.1038/s41429-019-0141-8 [Ōmura]

14 The "Utility" of Highly Toxic Marine-Sourced Compounds. *Mar. Drugs* 2019, 17, 324. www.mdpi.com/1660-3397/17/6/324/htm. A review of the use of toxic marine-sourced compounds as warheads for the preparation of clinically active antibody drug conjugates (ADCs). [Newman]

15 Recent Discovery of Plant-derived Anti-diabetic Natural Products, *Nat. Prod Rep.*, 2012, 29, 580-606. DOI:10.1039/C2NP00074A. [Lee]

16 Highly Sweet Compounds of Plant Origin: from Ethnobotanical Observations to Wide Utilization. *J. Ethnopharmacol* 2019, 243, 112056. DOI: 10.1016/j.jep.2019.112056 [Kinghorn, with Soejarto]

17 Improving Natural Product Research Translation: from Source to Clinical Trial; *FASEB Journal* 34, 41-64 (**2020**). dx.doi.org/10.1096/fj.201902143R [Pauli]

18 Scientific and Regulatory Approach to Botanical Drug Development: A U.S. FDA Perspective. *J. Nat. Prod.* 2020, 83, 552-562. DOI:10.1021/acs.jnatprod.9b00949

19 Sixty Challenges – A 2030 Perspective on Natural Products and Medicines Security. *Nat. Prod. Commun.*, **12**, 1371-1379 (2017). DOI:10.1177/1934578X1701200849 [Cordell]

20 Cognate and Cognitive Ecopharmacognosy – in an Anthropogenic Era. *Phytochem. Lett*., **20**, 540-549 (2017). DOI:10.1016/j.phytol.2016.10.009 [Cordell]

21 The Development of Botanical Drugs – A Review *Pharmaceut Reg Affairs*, 2019, 8:2. hilarispublisher.com/open-access/the-development-of-botanical-drugs--a-review.pdf [McChesney]