

新型コロナウイルスについての最新論文教材シリーズ 3

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第四回目の今日は、前回読んだ「SARS-CoV-2 Vaccines: Status Report (reported by Fatima Amanat and Florian Kramer)」の論文のコロナウイルスについての治療法について記述してある部分を読みます。生物の授業で習った知識を元に一読し、問いに答えてみてください。訳と問いの答えは週明けに up します。辞書を使ってもかまいません。

Therapeutics for SARS-CoV-2 Infections

Clinical trials with the nucleotide analog remdesivir and protease inhibitors, as well as other treatment options, are ongoing in China and the United States, and trial results are expected within weeks. Remdesivir works against coronaviruses closely related to SARS-CoV-2 in animal models, as well as against the related MERS-CoV, including in non-human primates (NHPs). Remdesivir was also tested for treatment of ebolavirus infections in humans (and found to be less successful than other treatments); therefore, safety data exist for this therapeutic agent, which should accelerate the process of clinical testing against SARS-CoV-2. Remdesivir's mechanism of action as a nucleotide analog is not clear, but it likely terminates RNA synthesis, leads to incorporation mutagenesis, or both. In addition, a combination of the two licensed HIV inhibitors, lopinavir and ritonavir, is also being tested in clinical trials. Lopinavir is a bona fide protease inhibitor, whereas ritonavir was initially designed as protease inhibitor but was found to boost the half-life of lopinavir by inhibiting cytochrome P450. The combination was used as treatment for SARS-CoV-1 in 2003–2004 and showed some promise. Effectiveness of the combination was limited in mice but appreciable in NHP models of MERS-CoV. The mechanism of action of lopinavir is not clear, but it likely inhibits one or more coronavirus proteases. Other treatment options with ongoing or planned clinical trials include

dosing recombinant human ACE2 to neutralize the virus and prevent lung damage and using the antiviral arbidol, a fusion inhibitor. Another interesting option is the use of convalescent serum as treatment; clinical trials to test this are ongoing in China, and compassionate use of this strategy has recently started in the US. Similarly, polyclonal human immunoglobulin G (IgG) derived from transgenic cows could be used, because this strategy has been successful for MERS-CoV in animal models and has been tested for safety in clinical trials. Many of these trials will have results within months, and if remdesivir and/or lopinavir plus ritonavir show effectiveness, they could potentially be used widely within a short time frame. Compassionate use of these drugs has already been reported for SARS-CoV-2 infections.

注 (黄色マーカーされている単語の意味)

	単語	意味
1	clinical trial	臨床試験
2	the nucleotide analog remdesivir	レムデシビル; 抗ウイルス薬の名前
3	protease inhibitors	プロテアーゼ阻害薬
4	ongoing	進行中で
5	test	試験運用する
6	ebolavirus infection	エボラウイルス感染症
7	therapeutic agent	治療薬
8	accelerate	加速させる

	単語	意味
13	lopinavir and ritonavir	ロピナビルとリトナビル; 抗ウイルス薬の名前
14	bona fide (ラテン語からの借用語)	本物の
15	cytochrome P450	シトクロム P450
16	promise	効果の約束
17	appreciable	目に見えるほど明らかな
18	dose	投薬する
19	recombinant human ACE2	ACE2 の組み換えタンパク質(の名前)
20	the antiviral arbidol	抗ウイルスアルビドール; 抗ウイルス薬の名前

9	terminate	終了させる
10	synthesis	合成
11	incorporation mutagenesis	突然変異誘発
12	HIV inhibition	HIV阻害剤

21	convalescent serum	回復期血清
22	polyclonal human immunoglobulin G (IgG)	ヒトIgGポリクローナル抗体
23	transgenic	遺伝形質転換性の

Q1 Choose one which the author explains as the role of remdesivir and lopinavir

- ① production of antibody ② induction of mutation ③ destruction of virus
 ④ inhibit of RNA synthesis ⑤ improvement of immunity

Q2 The author mentions that it will not take so much time to accomplish clinical retrials of medicines like remdesivir and lopinavir. Please explain the reasons.

次回は4月27日月曜日に更新予定です。

参考文献

Fatima. A & Florian. K (2020). SARS-CoV-2 Vaccines; Status Report, Immunity 52, April 14, 2020, cited from

[https://www.cell.com/immunity/fulltext/S1074-7613\(20\)30120-5](https://www.cell.com/immunity/fulltext/S1074-7613(20)30120-5) at the date of April 15. 2020.

山中伸弥 (2020) . 「山中伸弥による新型コロナウイルス情報発信」 . 2020年4月15日

<https://www.covid19-yamanaka.com/index.html> より引用