

## A Covid-19 treatment plan slowly emerges



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### Antivirals, anti-interleukins and vaccines take centre stage in clinical trial efforts to tackle the coronavirus pandemic.

It is easy to dismiss many of the publicity-seeking announcements related to Covid-19 over the past two weeks, but beyond the hype some active progress is being made at last.

Several potential treatments, led by Gilead's remdesivir, are now in the clinic, and an mRNA vaccine from Moderna was this week dosed to the first study subject. While the first antibody therapeutics are still at the planning stage, an interesting theory is developing around IL-6 inhibition, something that has resulted in a role being proposed for Roche's Actemra and Sanofi/Regeneron's Kevzara.

Excitement over IL-6 has already seen Tiziana jump on the bandwagon ([Tiziana takes a deep breath and targets Covid-19, March 11, 2020](#)). This had been spurred by the addition of Actemra, a rheumatoid arthritis drug, to Chinese guidelines on the basis that some Covid-19 patients respond to the infection by overproducing IL-6.

Two days ago Sanofi/Regeneron said they [were starting phase II/III trials with their own anti-IL-6 MAb, Kevzara](#). Clearly the side-effects of such drugs - Kevzara and Actemra carry black box warnings over risk of serious infections in patients with pulmonary disease - will need to be closely monitored.

Another emergency measure saw [China add favipiravir to its Covid-19 treatment programme](#). The flu drug is sold in Japan by Taisho and Fujifilm as Avigan, but has been discontinued virtually everywhere else; its toxicity profile will likely limit its use in Covid-19.

#### First line of attack

As far as antivirals go the greatest hope in the west comes from Gilead's remdesivir, now in two pivotal studies that could read out in May. One enrolls [moderately ill subjects](#) and the other [patients with severe Covid-19](#).

Several other intriguing studies have recently gone up on the Clinicaltrials.gov registry. [Neurorx plans to test aripiprazole](#), a largely discontinued antihypertensive, in Covid-19-related respiratory distress; and academic groups are studying [chloroquine](#) (in Covid-19 prevention), [Cozaar](#) and [Soliris](#).

[Biocryst is evaluating galidesvir](#), and Evercore ISI's Josh Shimmer has highlighted the potential of lopinavir/ritonavir; he sees these sorts of antivirals as a first line of attack against the new coronavirus. Amid the hype, however, it is noteworthy that Johnson & Johnson was moved to [issue a statement](#) cautioning that it had no evidence that its HIV antiviral Prezista had any effect on Covid-19.

### Selected other Covid-19 therapeutic projects

Synairgen	<a href="#">Starting trial of SNG001 (inhaled interferon-beta-1a)</a>
Mateon	<a href="#">To develop OT-101 (TGF-β2 inhibitor)</a>
Mallinckrodt	<a href="#">Evaluates inhaled nitric oxide for associated lung complications</a>
Emergent Biosolutions	<a href="#">Starts development of 2 plasma-derived projects</a>
Mesoblast	<a href="#">To evaluate remestemcel-L in ARDS caused by Covid-19</a>
Nascent Biotech	<a href="#">To study primumab (anti-IgG MAb)</a>
Evelo	<a href="#">Considers developing EDP1815 (anti-IL-6/IL-8)</a>
Cytodyn	<a href="#">Considers developing leronlimab (CCR5 antagonist)</a>
<i>Source: EvaluatePharma &amp; company statements.</i>	

Perhaps the most excitement is reserved for vaccines, though work so far is relatively early. Over 40 vaccines are in development, according to trial registries and company announcements, but only one, Moderna's mRNA-1273, is in a [clinical study; this is sponsored not by the company but by the NIAID](#).

A later line of attack is antibodies, but here none has entered the clinic yet. [Regeneron is thought by analysts to be able to move quickly here](#), and the area has provided fertile ground for deal-making, with [Vir collaborating with Biogen](#), and [Lilly with Abcellera](#), for instance.

There has also been business development aplenty in Covid-19 vaccines, with Biontech most recently [tying up with Pfizer](#) and [Fosun](#) over its mRNA project BNT162. And the German group is not standing around idly: a clinical trial under the Pfizer deal is to begin next month.

### Selected other Covid-19 vaccine projects

Johnson & Johnson	<a href="#">Collaboration with Beth Israel Deaconess Medical Center</a>
Heat Biologics	<a href="#">Collaboration with University of Miami</a>
Anges	<a href="#">Collaboration with Osaka University</a>
Epivax	<a href="#">Collaboration with University of Georgia</a>
Generex	<a href="#">Collaboration with Epivax</a>
Arcturus	<a href="#">Collaboration with Duke-NUS Medical School</a>
Inovio	<a href="#">Accelerates timeline for INO-4800</a>
<i>Source: EvaluatePharma &amp; company statements.</i>	

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