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I believe testosterone and other steroid like molecules help against the coronavirus infection. Current established theory is that steroids have a protective effect against the coronavirus by modifying the immune response of our body which is what your paper also supports.

However, one of the discoveries recently made is that steroid like molecules can also slow down the coronavirus infection rate by interacting with viral proteins.

For example, estrogen-benzoate binds to S2 subunit of the coronavirus S –protein and disrupts the virus cell entry by disrupting the function of the S2 subunit. This leads to a linear concentration dependent inhibition of the coronavirus infection in at least one coronavirus strain (1).

Another example is a steroid like molecule quercetin. This natural plant derived phytoestrogen was suspected to have an effect on coronavirus infection because it was shown “in silico” in docking simulations that quercetin binds to the coronavirus S – protein relatively strongly (2). Through clinical trials quercetin has shown good results as an early medicine or a prophylactic against the coronavirus.

I personally simulated binding of some steroids to the coronavirus S protein (unpublished). Here are the results that contain steroids with good binding energy to S-protein (expressed as kcal/mol, program Autodock Vina):

Estradiol = -9.4
Coumestrol = -8.8
Repensol = -8.7
Dihydrotestosterone = -8.5
Quercetin = -8.5
Testosterone = -7.9
Dexamethasone = -7
Medrol = -7
As we can see, estrogen (estradiol) had the best binding prediction to coronavirus, but dihydrotestosterone and testosterone also had relatively strong predicted binding which is not that surprising considering they are similar molecules. On the list are also plant estrogen like molecules (coumestrol, quercetin) and some steroid drugs already in use in medical practice (dexamethasone and medrol).

If you find the time, explore the potential effect of testosterone on virus in vitro, to see if the hormone has a direct interaction with virus proteins. Thank you for your work, Ante T.

1. **Drug Repurposing of Itraconazole and Estradiol Benzoat against COVID-19 by Blocking SARS-CoV-2 Spike Protein-Mediated Membrane Fusion** (2021.) Chan Yang, Xiaoyan Pan, Yuan Huang, Chen Cheng, Xinfeng Xu, Yan Wu, Yunxia Xu, Weijuan Shang, Xiaoge Niu, Yihong Wan, Zhaofeng Li, Rong Zhang, Shuwen Liu,*Gengfu Xiao,* and Wei Xu*

2. **Targeting SARS-CoV-2 spike protein of COVID-19 with naturally occurring phytochemicals: an in silico study for drug development** (2020.) Preeti Pandey, Jitendra Subhash Rane, Aroni Chatterjee, Abhijeet Kumar, Rajni Khan, Amresh Prakash and Shashikant Rayg