

Progress on Prostate Cancer Research

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Research

Advancements in prostate cancer research provide hope for finding a cure and lead to the discovery of new treatments to minimize the impact of a man's prostate cancer and maximize his quality of life. This regular *Hot SHEET* supplement includes some of the latest research from the Prostate Cancer Foundation (www.pcf.org).

The PCF is the world's leading philanthropic organization funding and accelerating prostate cancer research. Founded in 1993, the PCF has raised more than \$745 million and provided funding to more than 2,000 research programs at nearly 200 cancer centers and universities.

Prostate Cancer and COVID-19: What's the Connection?

Cases of COVID-19 and deaths are rising rapidly across the US and in many countries globally. Thousands of scientists around the world are working on vaccines and cures. Some of those scientists were full-time prostate cancer researchers just a few months ago. What happened? One reason is that many labs not doing COVID-19 research have been temporarily shuttered. But there's some fascinating biology connecting COVID-19 and prostate cancer that may yield a cure.

Some data suggest that men are more likely to die of COVID-19 than women. There may be many reasons for this, including biological mechanisms, underlying health status, and social/behavioral exposures. One biological piece may lie in a protein called TMPRSS2. In early 2020 in Germany, it was discovered that one of the ways that COVID-19 fatally infects is by entering lung cells using a "door handle" protein called TMPRSS2. TMPRSS2 is a receptor protein that is regulated by androgen, that is, testosterone. The TMPRSS2 and ACE-2 proteins are required for the coronavirus to enter lung cells.

Now we need to ask the question "Do male hormones drive TMPRSS2 in the lungs?" essentially creating more "door handles" to help the virus enter lung cells? Early data suggests that this is true. Based on what we know about TMPRSS2, this begs another question: "If we block male hormones (to decrease the number of 'door handles' on each lung cell), or if we stop the 'door handle' from turning with a drug, can we potentially block the virus from entering the lungs?"

Over the last 20 years, PCF has funded research into TMPRSS2 and prostate cancer. Thus, we know that in about half of all prostate cancer patients, TMPRSS2 is a key factor that drives prostate cancer, and TMPRSS2 is a key drug target in prostate cancer bone metastasis. Thanks to this foundational research, we also know TMPRSS2 could potentially be a drug target for COVID-19. Real-world evidence of the potential prostate cancer-hormone-COVID-19 connection was initially demonstrated by a PCF-funded study of men with prostate cancer in Italy that reported that men with prostate cancer who were taking ADT were four times less likely to be infected with the coronavirus than men who were not on ADT, and five times less likely to die. (Of note, at this time there are no recommendations to give ADT to men with prostate cancer solely for COVID-19 protection).

Because TMPRSS2 is a longstanding prostate cancer drug research target, very quickly, multiple prostate cancer researchers in the PCF research enterprise began collaborating with infectious disease experts, pulmonologists, and other experts to test their anti-TMPRSS2 drug approaches against COVID-19. Clinical trials around the world are investigating hormone therapy (eg. ADT, enzalutamide) and the TMPRSS2-blocking agents camostat or nafamostat in both hospitalized and outpatient populations.

For more information visit www.pcf.org, email info@pcf.org, or call 1-800-757-2873.