Podcast: How do COVID vaccines work? CRISPR kills cancer; Danish study debunks mask mandates?

The leading COVID-19 vaccines are RNA-based immunizations and the first of their kind. How do they work, and are they safe? CRISPR gene editing kills tumor cells in mice and may prove to be an effective replacement for chemotherapy. A controversial study out of Denmark suggests that masks may not offer much protection from coronavirus infection, but some experts say the results have been exaggerated.

Join geneticist Kevin Folta and GLP editor Cameron English on this episode of Science Facts and Fallacies as they break down these latest news stories:

- Infographic: What are mRNA COVID-19 vaccines and how do they work?

RNA-based COVID-19 vaccines teach your body how to make the spike protein SARS-COV-2 uses to cause infection; this triggers an immune response that will protect you from the virus should you be exposed to it. As at-risk populations begin receiving the first doses of these vaccines, alternative health proponents allege that they're based on untested technology and may cause potentially serious side effects. Is there any evidence to support these claims? And do we really know the vaccines are safe and effective?

- Cancer breakthrough replacing chemotherapy? Israeli scientists use CRISPR gene editing to snip DNA and kill killer cells

"A more elegant chemotherapy." That's how scientists at Tel Aviv University in Israel described their effort to treat cancer with CRISPR. The researchers used the gene-editing technique to tweak the DNA of tumor cells in mice suffering from glioblastoma, a brain cancer, and metastatic ovarian cancer.

Treated animals in the study had double the life expectancy of the control group, and a 30% higher survival rate. The research team now plans to develop the treatment for all cancers and begin testing it in humans within two years. If they are successful, we may be on track to eliminate the use of cancer therapies that often have severe side effects.

- Conservative media touts Danish study raising doubts about mask effectiveness. Health experts say that's dangerous

A randomized, controlled trial of more than 3,000 people conducted in Denmark recently found that "a recommendation to wear a surgical mask when outside the home among others did not reduce, at conventional levels of statistical significance, incident SARS-CoV-2 infection compared with no mask recommendation." Critics of the US government's coronavirus response took this as clear evidence that

masks generally offer little protection against COVID-19. But Dr. Henning Bundgaard, professor of Cardiology at Rigshospitalet in Denmark and the study's lead author, urged more caution:

> While the study found little evidence that masks protected the wearers from Covid-19, it should not be used as evidence to not wear a mask. Even a small degree of protection is worth using the face masks, because you are protecting yourself against a potentially life-threatening disease.

The debate has not faded in the weeks following the study's publication. Various fact-checking outlets have asserted that the study doesn't disprove the efficacy of masks, noting the trial had some important limitations. But critics maintain the study, despite its limited scope, confirmed that we don't have enough evidence to justify mandatory masking. What do we make of these competing narratives?

Subscribe to the Science Facts and Fallacies Podcast on iTunes and Spotify.

Kevin M. Folta is a professor in the Horticultural Sciences Department at the University of Florida. Follow Professor Folta on Twitter @kevinfolta

Cameron J. English is the GLP's managing editor. BIO. Follow him on Twitter @camjenglish