



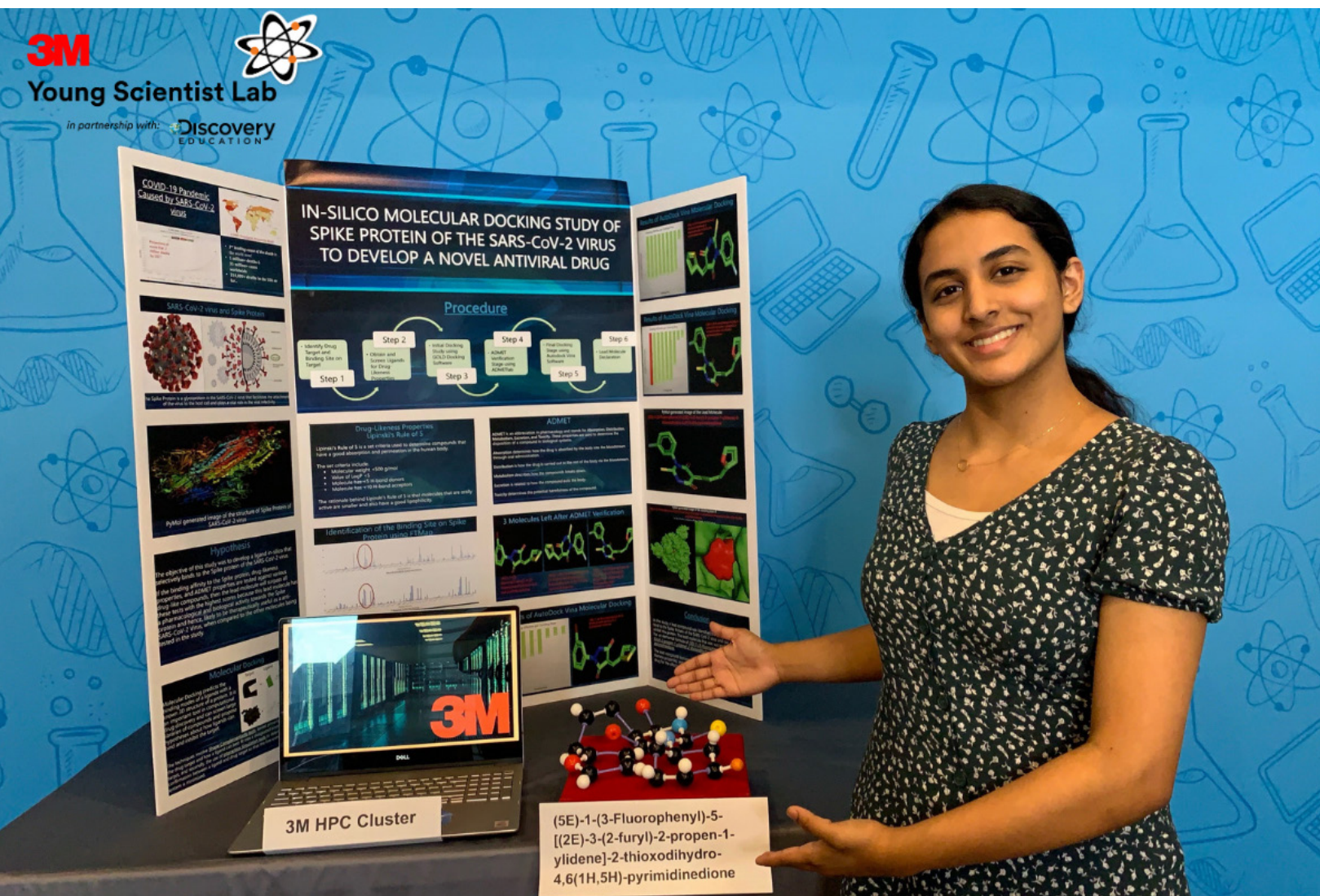
A CSFJ EXCLUSIVE INTERVIEW WITH ANIKA CHEBROLU



“

**ALWAYS REMEMBER
TO NEVER STOP ASKING
QUESTIONS AND ALWAYS
HAVE TRUST AND BELIEF IN
YOURSELF!**

MEET THE 3M YOUNG SCIENTIST CHALLENGE WINNER WHO, AT 14 YEARS OLD, HAS MADE A DISCOVERY THAT COULD LEAD TO A TREATMENT FOR COVID-19



CSFJ is thrilled to share our interview with Anika Cherbolu, America's Top Young Scientist of 2020. Anika is 14 and from Frisco, Texas. She recently won the 3M Science Challenge for her work discovering a novel small molecule which shows promise as a COVID-19 treatment. This work garnered Anika national praise, as she has been interviewed by Chris Cuomo on CNN and has been featured in numerous publications. In addition to her title, Anika has won a Discovery Education trip and \$25,000 USD, a portion of which she plans to donate to her non-profit, AcademyAid. CSFJ interviewed Anika about her project and the importance of mentorship in youth science initiatives. We hope you find Anika's story to be inspirational and thought provoking!

Your project started as a computational experiment to find treatments for the influenza virus. Do you think having a personal connection to research is important?

While having a personal connection may sometimes be a motivating factor that lets you identify with the project and its success, it is not the most important factor. On the contrary, if you are motivated and have a passion for your project, you will find your personal connection to your research anyway.

During your experiment, you screened millions of molecules. What database of small molecules did you use? What software did you use to perform this analysis? How did you learn to access and use this software?

The internet, in my opinion, is the greatest invention of our time. One of the fantastic things about it is that we have such easy access to so many wonderful software programs and databases from anywhere in the world. I used the ZINC15 small molecule database but there are many other databases that can be accessed. I dabbled with a lot of software packages and material. However, software implementation is not an easy feat, especially when you are new to the software. At many times, my tests would fail because of an error that would take me days to identify. After extensive research and many attempts, I became comfortable with the software I had used. It is important to never give up, especially in the times when it feels like giving up is the only option because if you give up, you not only let down hundreds of possibilities and opportunities but also all your work and passion.

Which molecule did you find to have the most potential as a possible COVID-19 treatment? Have you given any thought into the next steps in getting your discovery to market as a COVID-19 treatment?

Through my research, I discovered a molecule that can attach to the Spike protein on the SARS-CoV-2 virus and potentially change its shape and function. If you change the Spike protein shape, you can prevent the virus from being able to grab onto human cells and thereby reduce or treat further infection in a person's body. I started by identifying my drug target, which was the Spike protein on the membrane of the SARS-CoV-2 virus. I screened millions of small molecules against the Spike protein on the surface of the virus and tested three main things:

- I tested binding affinity, which assesses how strongly the molecules interacted with a certain spot on the spike protein.
- I tested to see if molecules would cause adverse effects in biological systems.
- I tested the molecules to be sure they could function when taken orally in the human body.

Once I ran these tests, I narrowed it down to one lead compound. This compound shows the best results from all the test I ran, and effectively binds to the Spike protein on the SARS-CoV-2. However, my research is merely the first stage of the long and tedious drug discovery process to come. It needs to be tested further by *in vivo* and *in vitro* methods to see if it can provide an effective antiviral against the COVID-19 pandemic.

It's been reported that you transitioned to SARS-COVID-2 under the advice of your mentor, Dr. Mahfuza Ali this summer. In what other ways has the mentorship component of the 3M Young Scientist Challenge transformed your approach to science? How did you discover this program? Do you have any advice for other young scientists seeking mentorship?

One of the many advantages of being selected as a finalist in the 3M Young Scientist Challenge is that you are given the opportunity to collaborate with an expert scientist from 3M. I was paired with Dr. Mafuza Ali, a corporate scientist from 3M's materials and resource division. Through my collaboration with Dr. Ali, I was able to gain expert scientific advice and access to many advanced resources including the high-performance computing server that helped me not only expedite but also improve my research project greatly. Dr. Ali has been so supportive of me throughout this entire competition. She mentored me all summer. While our mentorship in relation to the competition is over, I know she is someone I can always turn to for support and encouragement in my research. I first heard about the competition through my older brother – he told me two days before the submissions were due! So, we hustled to get my submission video done and turned it in. We were both so excited when I was named one of the top ten finalists.

Advice: Make sure to jump at any opportunity you see with your best abilities, as you never know where you could end up. Also, always remember to never stop asking questions and always have trust and belief in yourself!

You have said that you plan to use a portion of your prize money towards your non-profit, AcademyAid, which encourages STEM in underrepresented Indian communities. How do you think young scientists can decrease barriers and promote science in marginalized communities?

I think the lack of access to good scientific resources, unavailability proper mentors to stimulate curiosity in the kids, and the lack of role-models are probably the most important factors that discourage STEM in marginalized and underrepresented communities. I would like to use my efforts to spread awareness about the need for STEM-focused education. I hope to inspire kids everywhere and help them understand that they can achieve anything if they just put their mind to it.

In addition to the prize money and the title of "America's Top Young Scientist," you have won a Discovery Education trip. Once able to travel without COVID-19 restrictions, what would be your ideal vacation?

My family and I have always enjoyed visiting various tourist destinations to not only relax from our regular routines but also learn more about the places and the people we visit. I enjoyed visiting the Canadian Rockies a few years back and I would like to visit New Zealand. I am impressed with their natural beauty but also, I am in awe at how they were able to contain the pandemic.

We hope you've enjoyed our interview with Anika! Please stay tuned for more amazing science fair research from our other students, and be sure to check out our new YouTube Channel (CSFJ Connect) for more inspiring work!

Interview conducted via email. Responses edited for clarity by Emily Lind.

