Collaboratory Covid-19 Research Summaries

Start of Block: Introductory Text

Start of Block: Contact Information

Q1 Name

Liesl Jeffers-Francis, Phd

Q2 Email Address

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Q3 Department

Biology

Q5 Primary Institution

- O Appalachian State University (1)
- O Elizabeth City State University (2)
- O Fayetteville State University (3)
- O X NC A&T University (4)
- O NC Central University (5)
- O NC State University (13)
- O UNC Asheville (6)
- O UNC Chapel Hill (7)
- O UNC Charlotte (8)
- O UNC Greensboro (9)
- O UNC Pembroke (10)
- O UNC Wilmington (14)
- O Western Carolina University (11)
- O Winston Salem State University (12)

End of Block: Contact Information

Start of Block: Research Project Information

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Q6 Succinctly state your research question in 2-3 sentences (character limit 100).

Can metals and metallic nanoparticles bind to and inhibit the spike protein of SARS-CoV-2 from interacting with the cellular receptor on host cells?

Q7 Describe your research methods and activities in a short paragraph. Please use plain language and avoid technical terms unless necessary. (character limit 1,000).

To test the hypothesis that metals and metallic nanoparticles can bind to and inhibit the spike protein of SARS-CoV-2 from interacting with the cellular receptor on host cells. We proposed to complete the following activities: 1. Determine the optimal metallic nanoparticle (Ag, Al, Cu) that binds to SARS-CoV-2 spike protein using in-silico computational modelling techniques. 2. Confirm the in-silico model by combining the coronavirus spike protein with the metallic nanoparticle using

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Q8 Describe your research findings and conclusions in a short paragraph. Please use plain language and avoid technical terms unless necessary. (character limit 1,000).

We were able to simulate interactions between metal ions and metal nanoparticle (silver, copper, aluminum) with SARS-CoV-2 nucleocapsid protein. A SARS-CoV-2 virus-like particle has been created and is being tested for interaction with copper nanoparticles in-vitro. We have shown that increasing concentrations of copper on three human cell types results in increased cell death.

Q9 From your perspective as a researcher, explain any implications or policy recommendations resulting from your research (character limit 1,000).

It is possible that copper ion/nanoparticles can provide some protective qualities against coronavirus infection when embedded within a fabric, for example, filters, masks, protective clothing.

End of Block: Research Project Information

Start of Block: By the Numbers

Q11 How many members were a part of your research team? Include faculty, staff, postdoctoral researchers, graduate, and undergraduate students. If a type does not apply, please indicate with a numeric zero (0).

O Faculty (1) 2

O Staff, permanent (2) 0

O Staff, temporary (6) 0

O Postdoctoral researchers (3) 0

O Graduate students (4) 4

O Undergraduate students (5) 0

Q12 How many community members or participants did you engage in your research project? If not applicable, please indicate with a numeric zero (0).

0

Q20 How many University-external stakeholders or partners did you work with as part of your research project?
If not applicable, please indicate with a numeric zero (0).

1 - UNC Chapel Hill

Q18 Please detail any other interesting project-specific metrics (e.g. number of samples) that are relevant to your project below.

We observed that copper nanoparticles are toxic to three human cells types human acinar salivary gland cells, human ductal salivary gland cells and telomerase-immortalized human normal oral keratinocytes ,in a concentration dependent manner.

Q13 Were you able to leverage additional funding to continue the research funded by the NC General Assembly through the NC Policy Collaboratory?

- O Yes (1)
- O No (2)

Display This Question:

If Were you able to leverage additional funding to continue the research funded by the NC General As... Yes

Q15 Please detail the amount of leveraged funding and the funding agency or agencies below. If you received funding from more than 5 sources, please email Hope Thomson at thomson1@email.unc.edu .

	Funding Amount ($) (1)	Funding Agency (2)
Funding Source 1 (1)		
Funding Source 2 (2)		
Funding Source 3 (3)		
Funding Source 4 (4)		
Funding Source 5 (5)		

Q16 Do you have a grant in progress or plan to apply for additional funds to continue your work as funded by the Collaboratory? If so, please detail the grant amounts and funding agencies below to the best of your knowledge.

Yes, we plan to first publish the data that we received then use this data to appyly for NSF/NIH funding. We have not identified a specific RFA as of yet.

Q17 Please include below any links to news coverage, press releases, or other public-facing documentation of your Collaboratory-funded work:

Virtual presentation at North Carolina A&T State University annual Center of Excellence Research Symposium

End of Block: By the Numbers