



Surface Cleanliness and Virus Presence on Cruise Ship Staff Premises

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Aim of the study

- The aim of the whole project was to investigate chemical, microbiological and particulate exposures in the cruise ship environment, as well as ways to reduce exposure to pollutants through optimal cleaning practices and ventilation techniques.
- The aim of the sub-study was to investigate the surface cleanliness of a cruise ship and the presence of viruses on surfaces

Materials and methods

Surface cleanliness samples

- Luminometer
 - 3 cruises
 - 68 samples
- PCR Surface Scanning Method
 - 3 cruises
 - 50 samples
 - Respiratory viruses (enterovirus, rhinovirus, SARS-CoV-2 coronavirus, influenza A virus)
 - Gastrointestinal viruses (norovirus)



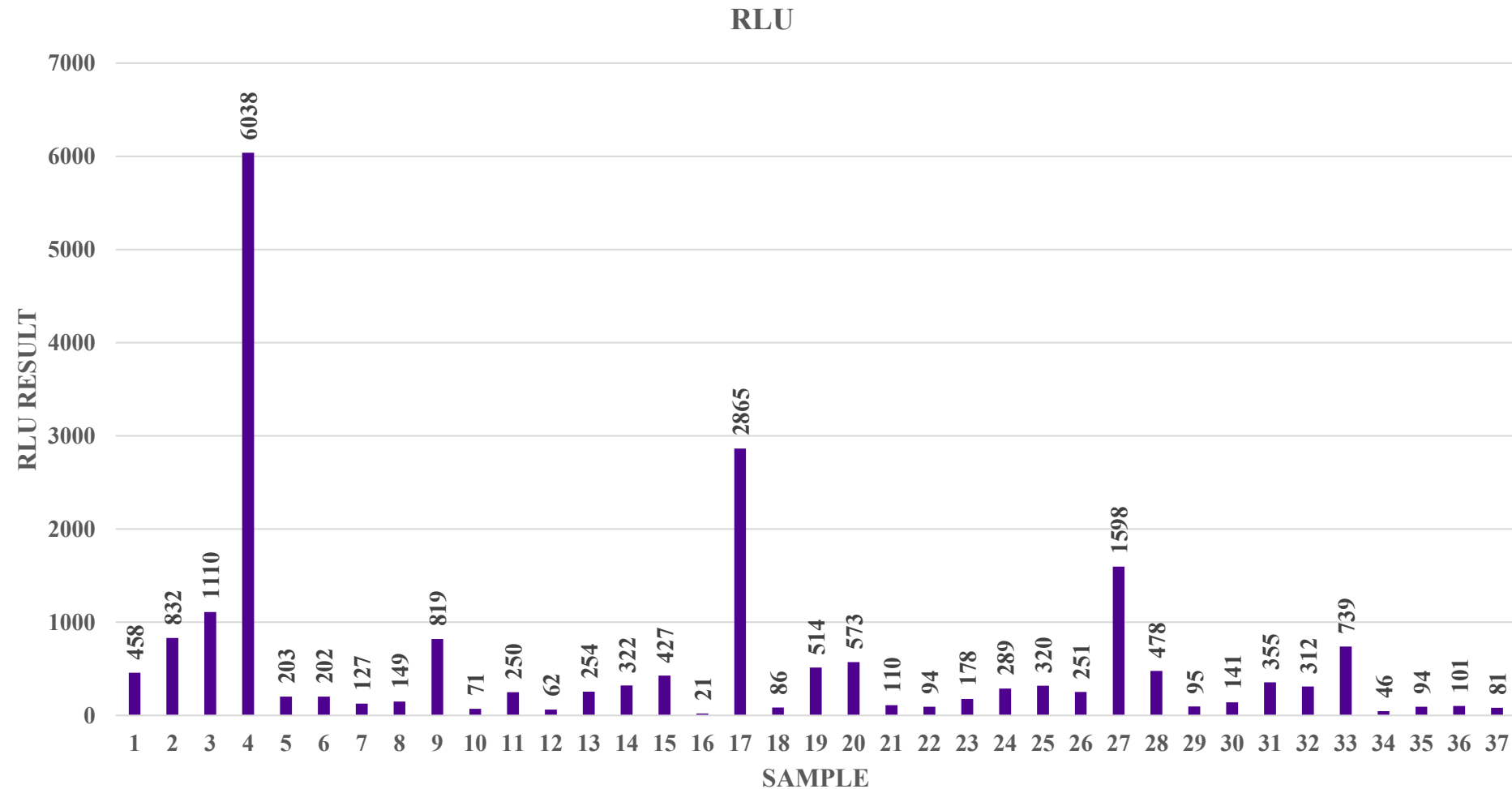
Results of the luminometer

- The ATP measurement results were quite poor, which suggests that the surfaces were not as clean as required
- 5 pcs under 50 RLU, There were 12 results over 50–100 RLU,
- 75% of the results were bad.
- The worst value was 6038 RLU

Poor results may be partly due to biofilm broken by sampling or just too worn surfaces and the need for more effective cleaning



RLU values measured in crew only areas using the luminometer



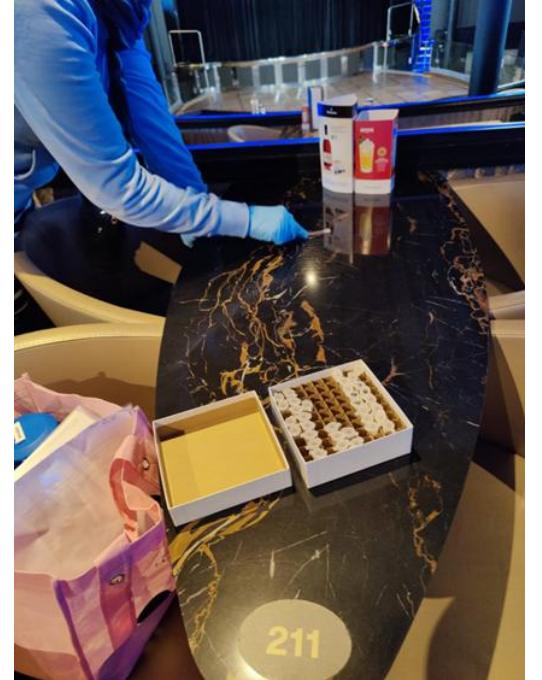
Results PCR

SARS-CoV-2 coronavirus (5 pos)

- 3 Positives Cruise 1 (November 2023)
- 2 Positives Cruise 3 (August 2024)

Influenza A virus

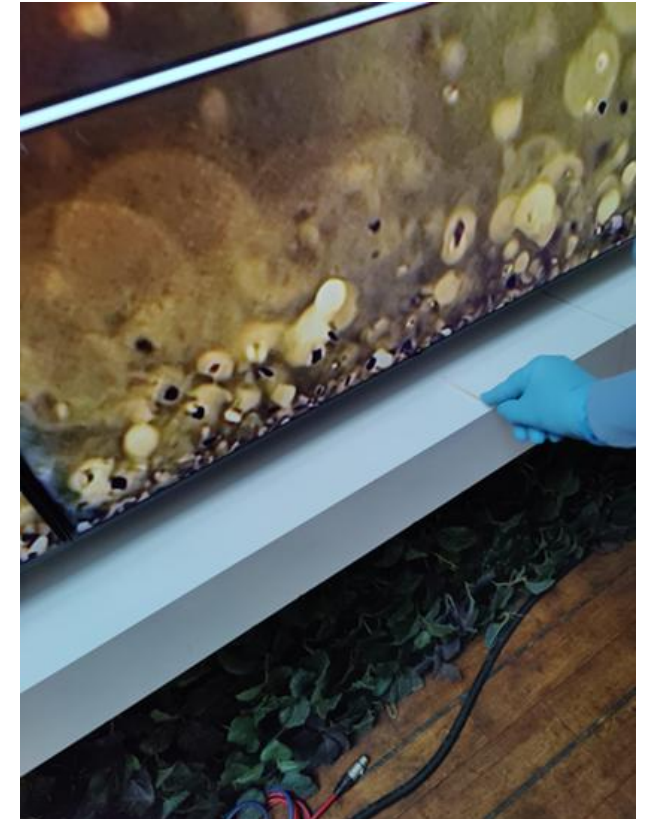
- 1 Positive Cruise 2 (February 2024)



The number of viruses in all positive samples was low
This method does not demonstrate the infectivity of viruses

Discussion

- The positive influenza A virus sample has been taken from the same site as the positive SARS-CoV-2 coronavirus sample from the third cruise.
- However, these were different cruises.
- The object is on the walking deck at the entrance of the vessel.
- In the results of the ATP measurements, the cleanest sample (5 RLU) from the same site was obtained on the third cruise.



Conclusions

- Cleaning on cruise ships occurs both while docked and during voyages.
- Maintaining high hygiene standards in areas such as restaurants, where staff are responsible for cleaning, is essential.
- The results contribute to the development of optimized cleaning strategies aimed at reducing exposure to environmental contaminants for both passengers and crew.

Acknowledgements

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