ADVANCING VIRAL TRANSMISSION RESEARCH:

Why Labskin-S Was the Model of Choice for SARS-CoV-2 Skin Studies

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When researchers at the Liverpool School of Tropical Medicine set out to better understand how SARS-CoV-2 survives on skin and transfers from contaminated surfaces, they faced a critical scientific and ethical challenge: how do you realistically replicate human skin without putting volunteers at risk?

In a recently published manuscript examining SARS-CoV-2 survival and transfer dynamics, lead researcher Dr. Ana Pitol Garcia and her team turned to Labskin-S plates, a 3D human skin model designed to closely mimic the physical and environmental properties of real skin. In this interview, Dr. Pitol Garcia explains the motivation behind the study, the decision to use Labskin-S, and why that choice strengthened the scientific credibility and real-world impact of their findings.

Dr. Pitol Garcia

Understanding the Risk of Surface Transmission

To start, what motivated this study and what were you hoping to uncover about SARS-CoV-2 survival and transfer on skin?

We were interested in quantifying the risk of SARS-CoV-2 transmission through contaminated objects. Understanding that risk is essential for designing and evaluating interventions - such as hygiene practices and surface disinfection - that reduce transmission. To do that effectively, we needed reliable data on how the virus survives and transfers in realistic scenarios.

Why Skin - Not Just Surfaces - Matters

Why was it important to look at virus behaviour on skin rather than only on hard, inert surfaces?

Our aim was to develop a safe and realistic alternative to using human volunteers' hands. We wanted to conduct virus transfer experiments using a model that closely mimics human skin so we could study SARS-CoV-2 without exposing volunteers to unnecessary risk. Skin plays a unique role in transmission, and traditional surfaces simply don't replicate its properties.

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At what point did you realise a skin model was necessary?

From the beginning, we knew that no conventional surface was close enough to human skin for the type of experiments we wanted to perform. We needed either human skin or a validated human skin model.

Defining the Ideal Skin Model

What were you looking for in a suitable model?

We needed a model that closely replicated key physical and environmental properties of human skin relevant to virus transfer. That included surface texture, mechanical properties such as tension, moisture levels, and overall behaviour during contact.

Beyond realism, it had to be reproducible, safe to use with the virus of interest, and compatible with controlled laboratory experiments to ensure consistent and comparable transfer measurements.

Why Labskin-S?

What led you to choose Labskin-S plates over other options?

We evaluated several alternative skin models in pilot studies. Labskin-S most closely resembled human skin in terms of transfer behaviour. In side-by-side comparison experiments using bacteriophage as a surrogate virus, transfer efficiency from surfaces to Labskin-S plates was not significantly different from transfer efficiency to volunteers' hands.

That was a key finding for us.

How was your experience working with the Labskin-S plates?

It was positive. The constructs were relatively easy to handle and integrate into our experimental workflow. They were mechanically robust and withstood the procedures involved in transfer studies. They were also thicker than other alternatives we evaluated, which reduced damage during experiments and improved consistency across replicates.

Did anything surprise you about their performance?

Yes - we were positively surprised by how closely the Labskin-S plates matched human hands in transfer experiments. The virus transfer efficiency was very similar to what we observed with volunteers' hands. The level of agreement was stronger than we initially expected, which gave us additional confidence in the model as a realistic surrogate.

Strengthening Scientific Credibility

What did Labskin-S enable scientifically that would have been difficult otherwise?

It allowed us to study SARS-CoV-2 transmission from contaminated surfaces under controlled laboratory conditions, with confidence that the results reflected what we would likely observe in real human interactions. Without a realistic skin model, our findings would have been far less convincing.

Did using Labskin-S strengthen the real-world relevance of your findings?

Absolutely. If we had used a simpler, non–skin-like surface - or if we had not validated the model through side-by-side comparisons with human hands - the results would have been more open to criticism. Demonstrating comparable transfer efficiency significantly increased the reliability and practical applicability of our conclusions.

How did the choice of model influence the credibility of your data?

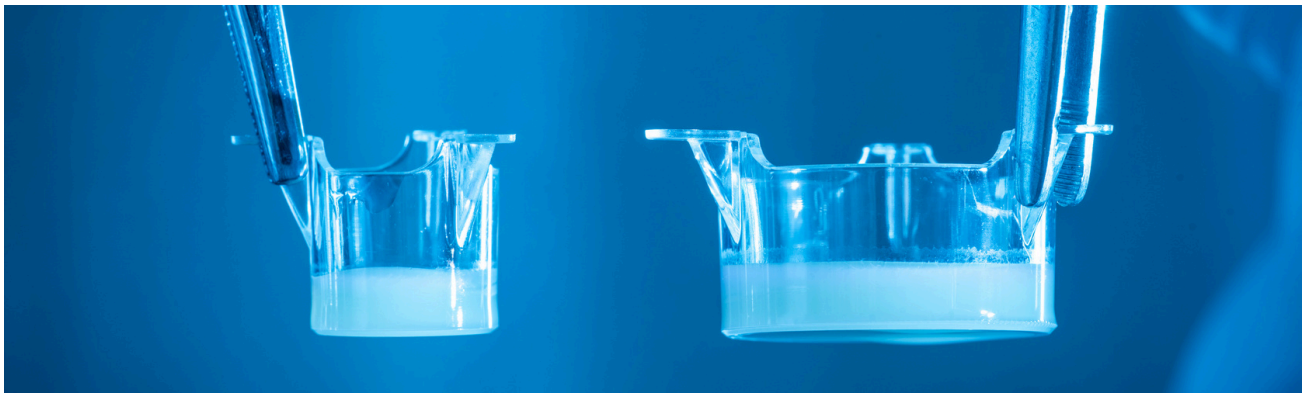
Choosing a validated, skin-realistic model improved both the quality and credibility of our data. Because Labskin-S closely matched human hands in transfer efficiency and handling properties, our results are more robust, reproducible, and directly relevant to real-world transmission scenarios.

Looking Ahead: Beyond SARS-CoV-2

Where else do you see Labskin-S being useful in future research?

It could be used to understand the transfer of a wide range of pathogens from contaminated environments to human skin, and to evaluate the effectiveness of hygiene interventions.

What advice would you give to other researchers considering a 3D skin model?
For researchers interested in quantifying pathogen transfer between contaminated environments and people, I would strongly recommend considering a 3D skin model like Labskin when the research question involves hand contact or skin-related transfer. It can substantially



A Model That Bridges Safety and Scientific Rigor

As infectious disease research continues to evolve, the need for models that balance safety, realism, and reproducibility has never been greater. By selecting Labskin-S as a validated surrogate for human skin, Dr. Ana Pitol Garcia and her colleagues at the Liverpool School of Tropical Medicine have demonstrated how thoughtful model selection can enhance both the credibility and real-world impact of viral transmission research.

Their work not only advances understanding of SARS-CoV-2 transmission dynamics - it sets a benchmark for how future pathogen transfer studies can be conducted with scientific rigor and ethical responsibility.

Read the full publication here:
https://pmc.ncbi.nlm.nih.gov/articles/PMC12180721/pdf/pone.0325235.pdf

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