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The choice of suitable cell substrates for the manufacture of viral vaccines has over the years engendered considerable discussion. The primary focus in these discussions on cell substrates have been safety, in particular the potential safety concerns from residual cellular DNA and from adventitious viral agents.

As history has shown, the need for concern about cell substrate issues was real. We have only to

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¹ <https://www.fda.gov/vaccines-blood-biologics/biologics-research-projects/investigating-viruses-cells-used-make-vaccines-and-evaluating-potential-threat-posed-transmission>

problem with the contamination. But the main disadvantage of the continuous cell line is that many do express endogenous viruses and there has always been this concern over tumorigenic potential, should we say, associated with cellular DNA.

The main three risks then with these different cell lines for producing biologicals are contaminating viruses, and we must include here, the TSEs, the transmissible spongiform encephalitis agents, whatever that may be in the end, residual host cell DNA, and growth-promoting proteins. And as I

The other surprise was the detection of SV40 genome in rare human tumors. This is something which has come back to haunt us after 30 years or so. I am sure you all know that SV40 was a contaminant of some of the early batches of primary rhesus monkey kidney cells used to produce polio vaccines. This is no surprise. During the 1950's, these were actually used in a large number of people -- in the millions. There was follow-up with that to see whether they actually caused any problems, and nothing much materialized. And then suddenly about three or four years ago, the SV40 sequences were picked up in various rare human tumors. That raised the issue of was the vaccine -- was the polio vaccine made in primary kidney cells actually still transmitting SV40

Everybody is together here. We need to consider again, I think, some of the issues of residual DNA. Is it oncogenic? What is the issue there? Is there an infectious DNA in relation to what sorts of cell line you've got and what is in the cell? It is really timely to review and assess the risks in light of a

unless they are very closely related. The concern I would have of vaccines made in higher species, monkeys or humans, is that probably there are -- or not probably, there may be some stealth viruses like these

that don't produce any obvious effect and that we don't even know about their presence to even detect them in animals. Let's say the chicken virus requires

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