Electronic Supplementary Material (ESI) for Lab on a Chip.
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Article

Supporting information: A microfluidic impedance-based extended infectivity assay: Combining retroviral amplification and cytopathic effects monitoring on a single lab-on-a-chip platform

Received 00th January 20xx,
Accepted 00th January 20xx

DOI: 10.1039/x0xx00000x

www.rsc.org/

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2. Materials and methods

Chip design and fabrication

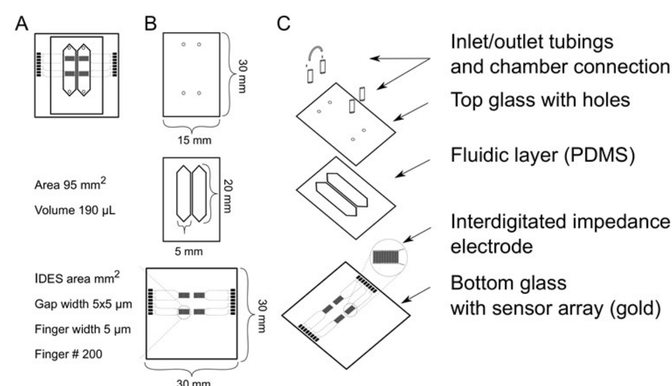

Figure S1: Schematic overview of the Lab-on-a-chip device: A) representation of the specifications of the assembled device. B) Top view on the single layers, including base with embedded sensors, two-chambered fluidic layer for cell cultures and top layer with holes for connective tubing. C) Exploded isometric perspective of the device.

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Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/x0xx00000x

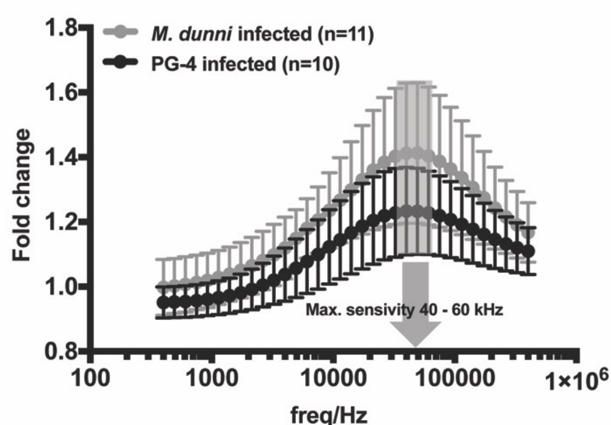
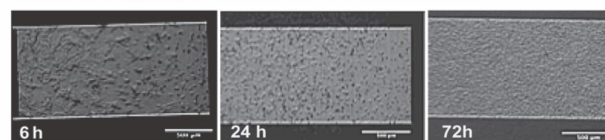


Figure S2: Analysis of frequency dependent sensor sensitivity of and *M. dunni* (n=11) and PG-4 (n=10) cultures infected by various titres of the x-MuLV.



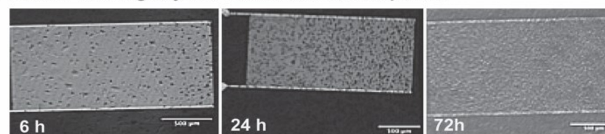


Figure S3: Sensor cell coverage throughout culture period: A.) and B.) Representative images of healthy *M. dunni* and PG-4 cultures at 6, 24 and 72h after cell seeding (scale bar 500 µm).

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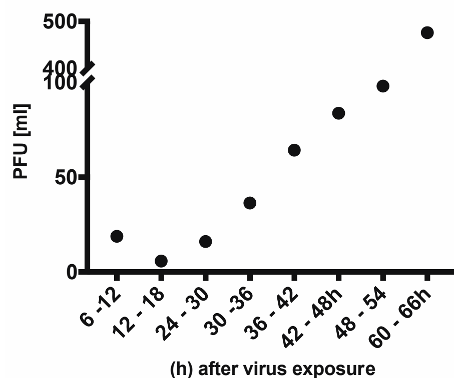

Figure S4: Quantification of PFU/ml in supernatant of *M. dunni* cell cultures inoculated with an initial virus titre of 7.7 × 103 PFU/ml 12 h after cell seeding.

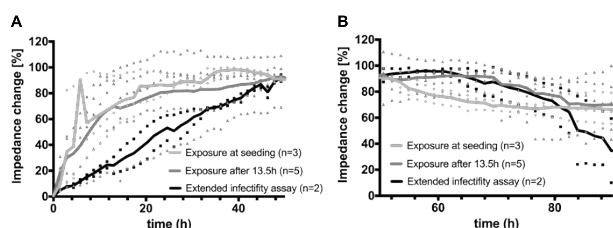

Figure S5: Comparison of impedance traces during assay procedure optimization: A) First 50 h of impedance trace of PG-4 cell cultures exposed with a virus titer of 2.2 × 105 PFU/ml at the time point of cell seeding (light grey), virus exposure after 13.5 h (grey) and coupled in dual culture to the propagation cell line (black). B) Close up of the decreasing impedance signals after the onset of cytopathic effects in the PG-4 cultures. (Exposure at seeding reflect the inoculation with virus supernatant at the beginning of the cell culture period with uncoupled chambers, exposure after 13.5 h the cell cycle dependent timed inoculation with uncoupled cell cultures and finally the established extended infectivity assay protocol.

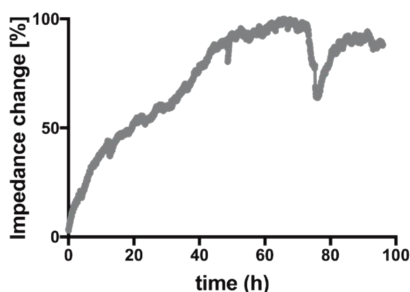

Figure S6: Impedance time trace of PG-4 cells inoculated with a heat inactivated viral supernatant of 2.2 × 10^5 PFU/ml.

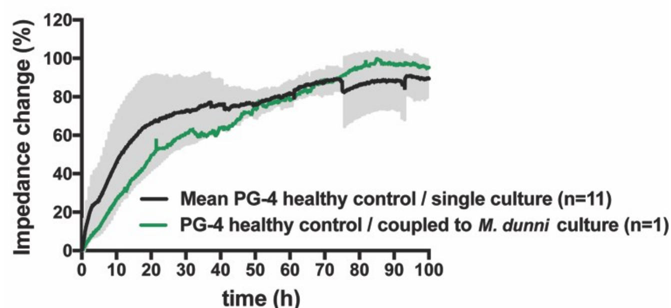

Figure S7: Comparison of growth curve dynamics of PG-4 healthy control coupled to *M. dunni* culture (green) (n=1) to the mean (shaded in grey) of PG-4 healthy control single culture (n=11) over the time course of 100 h shows no significant difference (data set within 1 σ).

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