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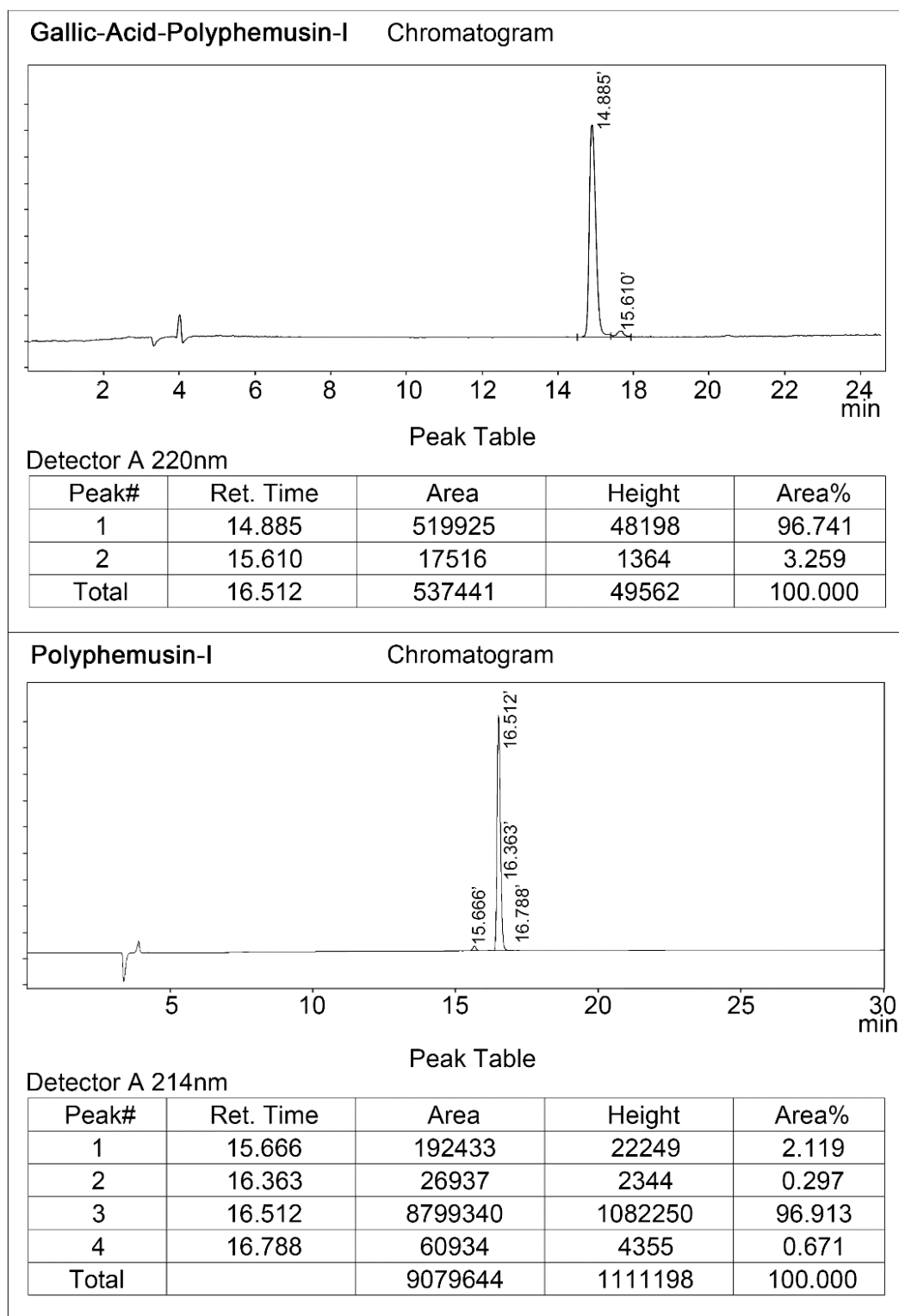
## Supplementary S1

### Experimental protocol. Propidium monoazide–quantitative polymerase chain reaction (PMA-qPCR) test

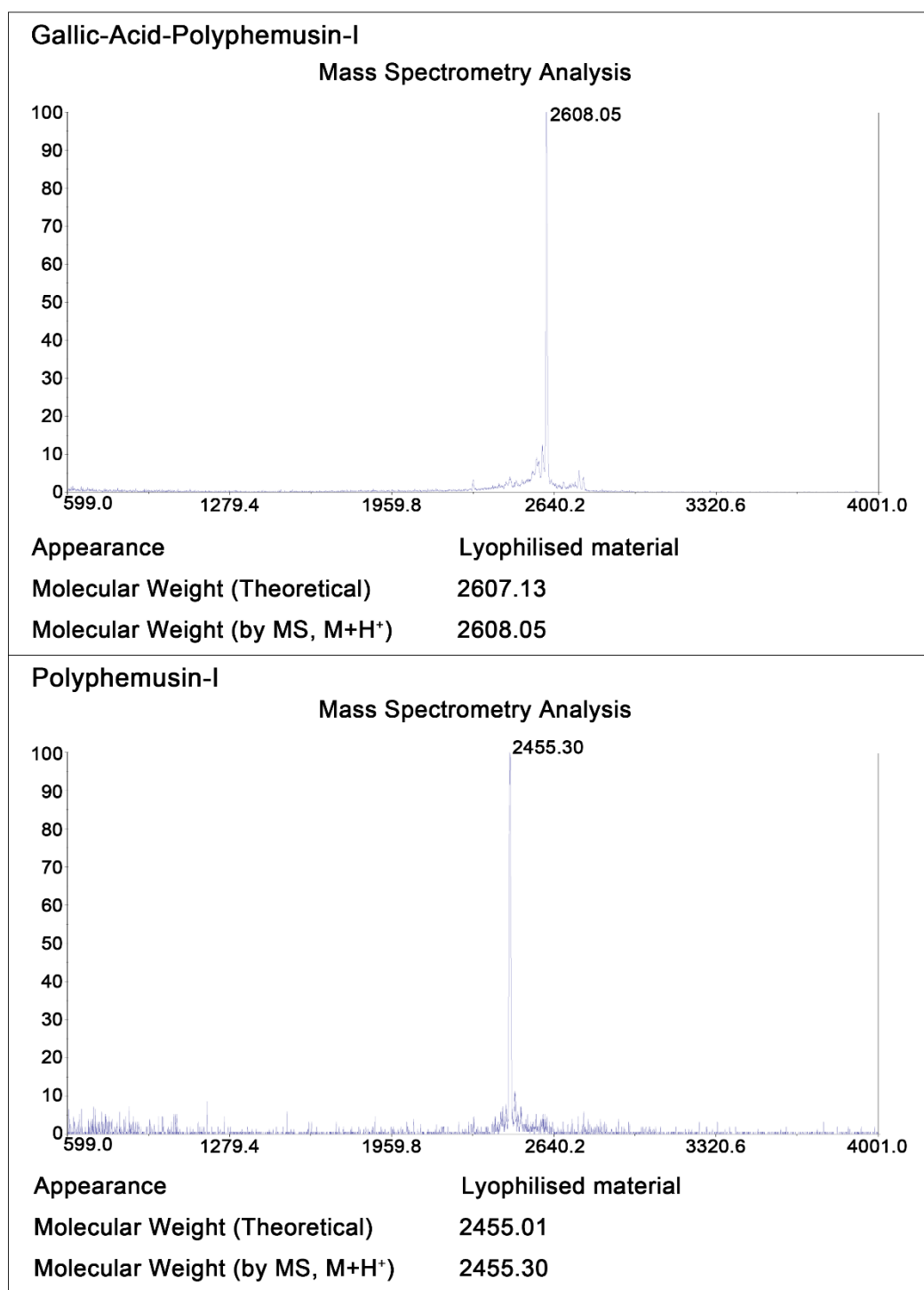
The growth kinetics of the multiple-species biofilm were analysed using propidium monoazide–quantitative polymerase chain reaction (PMA-qPCR). Biofilm was suspended in phosphate-buffered solution. The suspension was treated with propidium monoazide (PMA) (Biotium, San Francisco, USA) and exposed to halogen light photoactivation (PMA-Lite™, Biotium, San Francisco, USA). The brightness (luminosity) of the light device is 600-800 millicandela and its wavelength is 465-475 nm. Then deoxyribonucleic acid (DNA) was extracted from PMA-treated biofilm suspension using QIAamp DNA Mini Kit (QIAGEN, Düsseldorf, Germany). The oligonucleotide primers and TaqMan probes were used to quantify multiple-species cariogenic biofilm species: SMUT-forward(F), SMUT-reverse(R) and SMUT-probe(P) for *Streptococcus mutans*, Lc-F, Lc-R, Lc-P for *Lactobacillus casei* and Ca-F, Ca-R and Ca-P for *Candida albicans* (Table). Taqman reactions contained 1µl each primer and probe, 10µl master mix (Applied Biosystems, Waltham, USA), 2µl sterile water and 5µl sample DNA. The thermocycling was conducted in a StepOnePlus real-time PCR system (Applied Biosystems, Waltham, USA) under the following conditions: an initial 2 min at 50 °C, followed by a denaturation step for 10 min at 95 °C, followed by 50 cycles of 95 °C for 15 s and 58 °C for 60 s. A standard curve was constructed using a series of known concentrations of microorganism cells for each species.

**Table.** List of the oligonucleotide primers and TaqMan probes for the propidium monoazide–quantitative polymerase chain reaction test

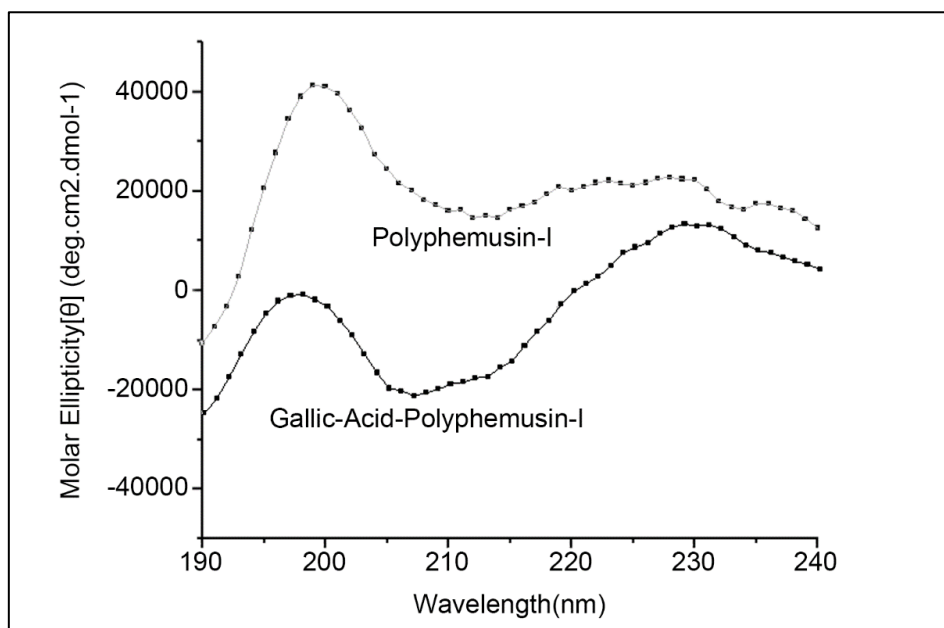
Name	Sequence
Ca-F	5'-GTGAATCATCGAATCTTTGAAC-3'
Ca-R	5'-TCCTCCGCTTATTGATATGC3'
Ca-P	6FAM-ATTGCTTGCGGCGGTAACGTCC-TAMRA
Lc-F	5'-AGGCGGCTGTCTGGTCTGTA-3'
Lc-R	5'-CCTGTTCGCTACCCATGCTT-3'
Lc-P	6FAM-TGACGCTGAGGCTC-TAMRA
SMUT-F	5'-GCCTACAGCTCAGAGATGCTATTCT-3'
SMUT-R	5'-GCCATACACCACTCATGAATTGA-3'
SMUT-P	6FAM- TGGAATGACGGTCGCCGTTATGAA-TAMRA



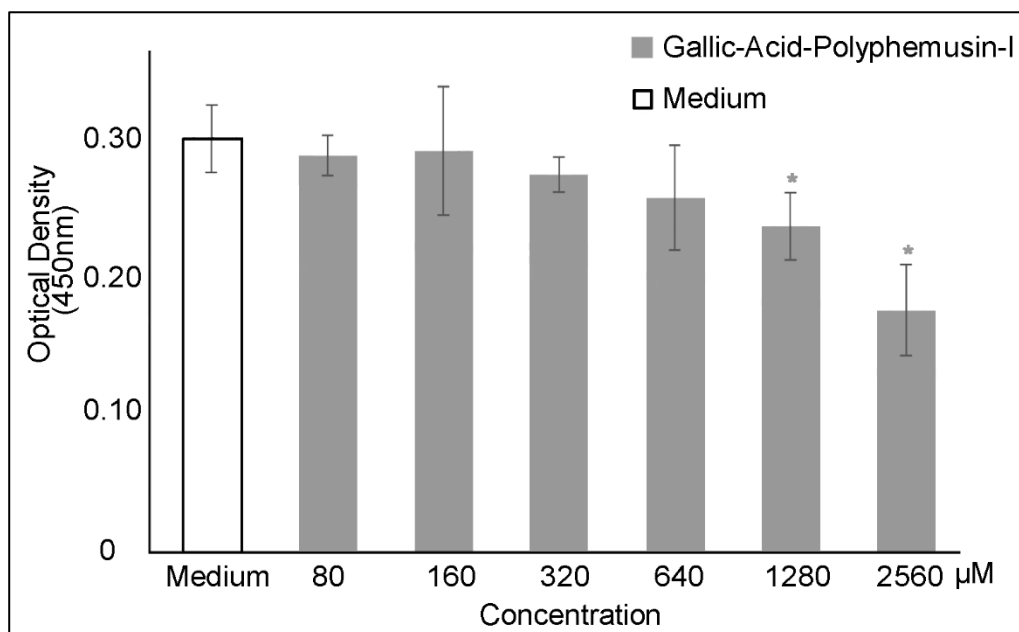
**Supplementary S2.** High-performance liquid chromatography for Gallic-Acid-Polyphemosin-I (GAPI) and Polyphemosin-I. The area percentage of the major peak indicated the purity of the testing peptide. The purity percentages of GAPI and polyphemosin-I were 96.74% and 96.91%, respectively.



**Supplementary S3.** Mass spectrometry analysis for Gallic-Acid-Polyphemosin-I (GAPI) and Polyphemosin-I. The molecular weight was 2608.05 kD for GAPI and 2455.30 kD for polyphemosin-I. The molecular weight of the synthesised peptide was 152.92 kD more than that of polyphemosin-I. It is equal to the molecular weight of gallic acid minus a water molecule due to polymerisation.



**Supplementary S4.** Circular dichroism spectroscopy spectrum for Gallic-Acid-Polyphemosin-I (GAPI) and Polyphemosin-I. The secondary structure was modelled using CDPro software. The secondary structure analysis of GAPI and polyphemosin-I showed that the proportions of the  $\beta$ -sheet were 48.0% and 73.1%, respectively.



**Supplementary S5.** Concentration of Gallic-Acid-Polyphemosin-I (GAPI) and optical density values of human gingival fibroblasts. The biocompatibility of GAPI was evaluated by cytotoxicity assay using Cell Counting Kit-8 Assay. Human gingival fibroblast cells were cultured and treated with GAPI. The cells cultured with the only medium were negative controls. The optical density values indicating the number of viable cells was measured at 450 nm after 24 h of incubation. There was no significant difference in optical density values between the 80, 160, 320 and 640 μM GAPI-treated HGF-1 cells and the negative control cell. It revealed that GAPI showed low cytotoxicity to HGF-1 cells.