Fusobacterium polymorphum induced proliferation and migration of oral squamous cell carcinoma cells and attenuation of these effects

Syeda Areeba Rehan[1,2*], Joseph Tucci [1,2], Elizabeth Sari[1,3] and Mwila Kabwe[1,2]

[1]Holsworth Biomedical Research Centre, La Trobe Rural Health School, La Trobe University, P.O. Box 199, Bendigo VIC 3550, Australia

[2]La Trobe Institute for Molecular Science, La Trobe University, P.O. Box 199, Bendigo, VIC 3550, Australia

[3]Ajman University, P.O. Box 346, Ajman, United Arab Emirates

1. BACKGROUND

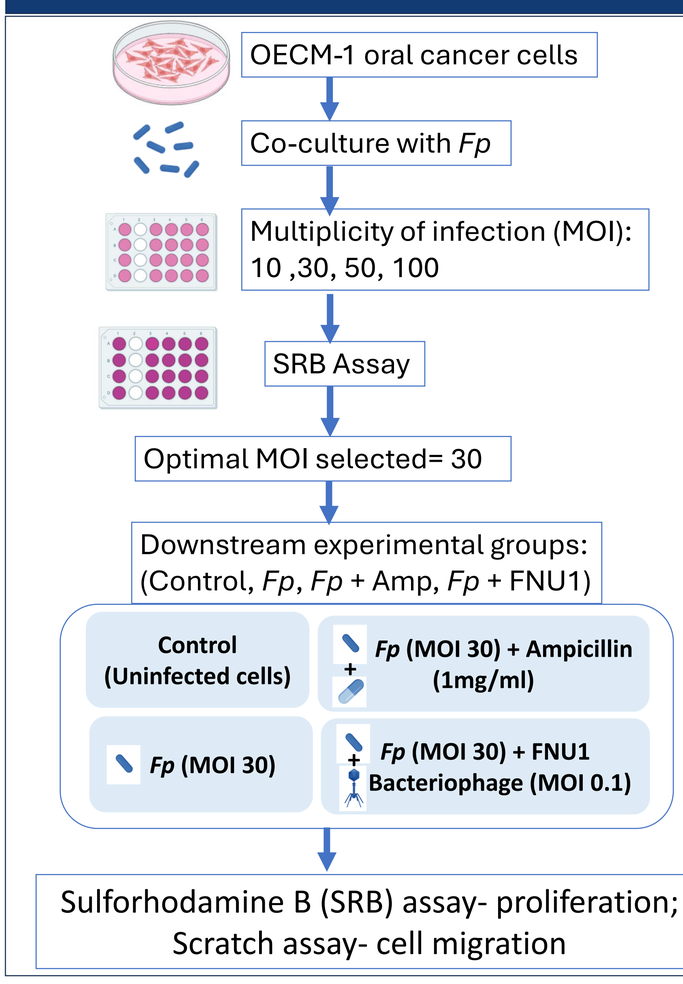
The oral microbiome can modulate tumour behaviour in oral squamous cell carcinoma (OSCC).[1] *Fusobacterium polymorphum (Fp)* is frequently enriched in OSCC, but its direct effects on cancer cells are not fully understood.[2]

This study investigated the impact of *Fp* on OECM-1 OSCC cell proliferation and migration and evaluated two modulatory approaches: ampicillin and bacteriophage FNU1[3].

2. OBJECTIVES

1. To evaluate effect of *Fp* at different MOIs on proliferation of OECM-1 cells.
2. To select an optimal MOI for downstream assays.
3. To assess whether ampicillin or FNU1 modifies *Fp*-induced proliferation and migration

3. EXPERIMENTAL OVERVIEW



4. MATERIALS & METHODS

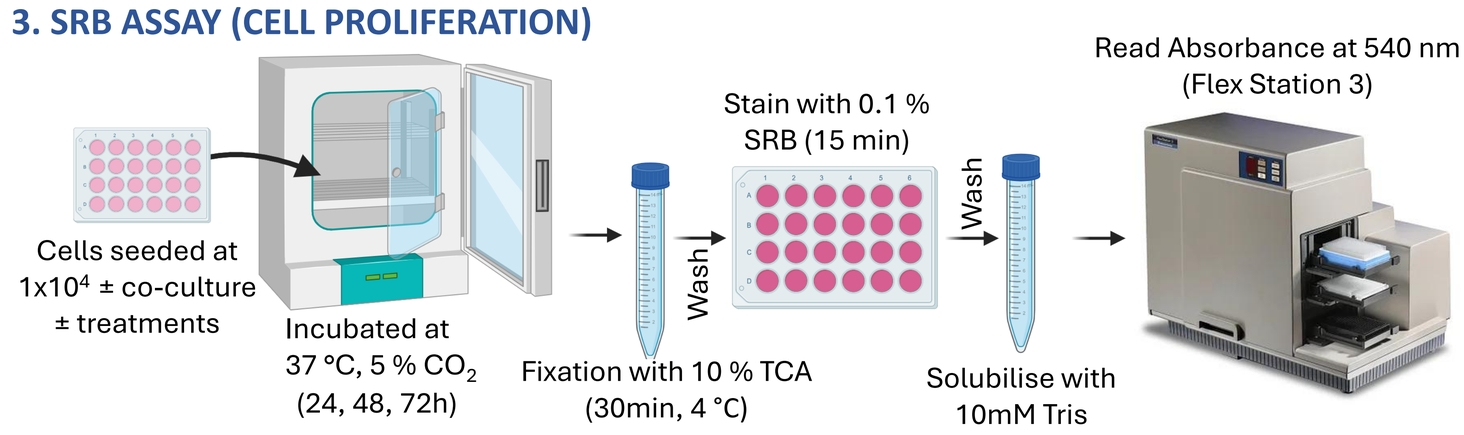
1. CELL CULTURE

OECM-1 cells were cultured in RPMI-1640 medium supplemented with 10% fetal bovine serum (FBS) at 37 °C in 5% CO_2.

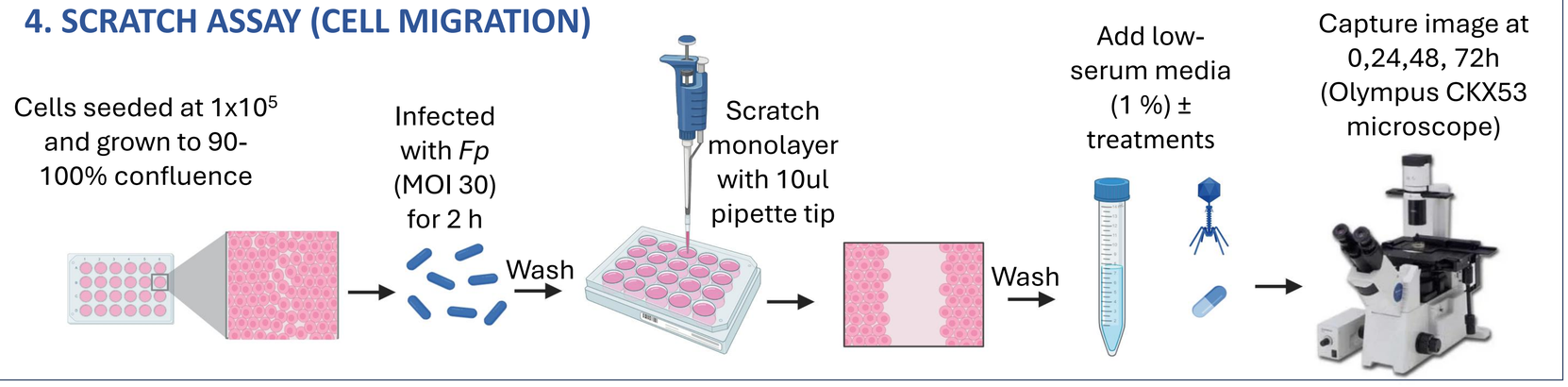
2. BACTERIAL INFECTION

Fp (ATCC 10953) cultured anaerobically in supplemented tryptic soy broth, grown to mid-log phase and standardised by OD_{600}.

3. SRB ASSAY (CELL PROLIFERATION)



4. SCRATCH ASSAY (CELL MIGRATION)



5. RESULTS

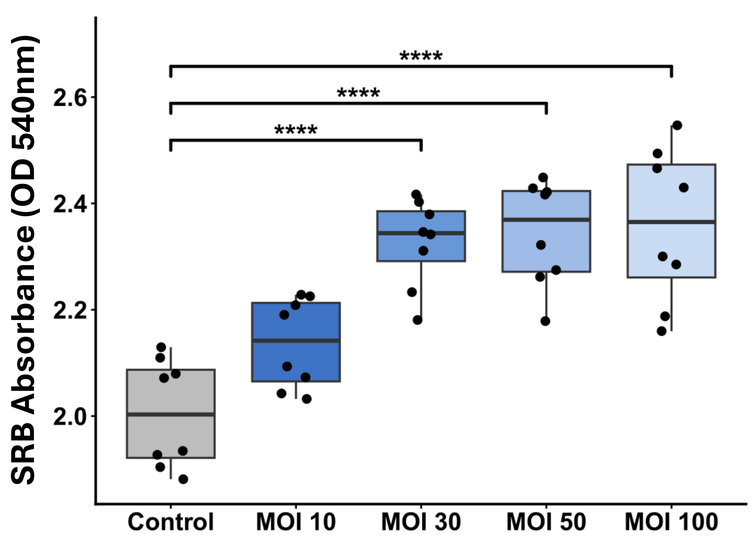


Fig 1. Effect of *Fp* (MOI 10, 30, 50, 100) on OECM-1 cell proliferation measured by SRB assay (72h). Data are presented as mean ± SD (n = 8). One-way ANOVA with Tukey's multiple comparisons test; (****p < 0.0001)

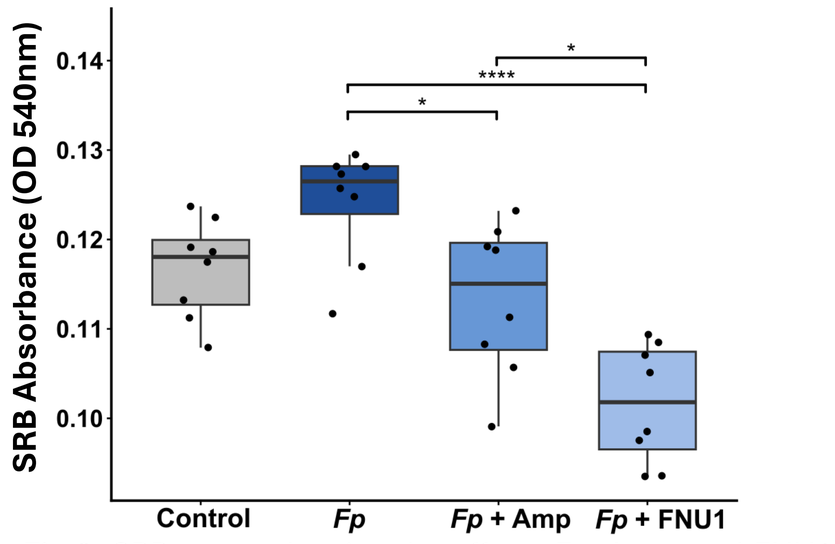


Fig 2. SRB assay showing the effect *Fp*, Amp, and FNU1 on OECM-1 cell proliferation after 24 h. *Fp* (MOI 30) increased cell proliferation, whereas Amp and FNU1 significantly reduced this effect. Data represent biological replicates (n = 8). One-way ANOVA with Tukey's multiple comparisons test (*$p < 0.05$; ****$p < 0.0001$).

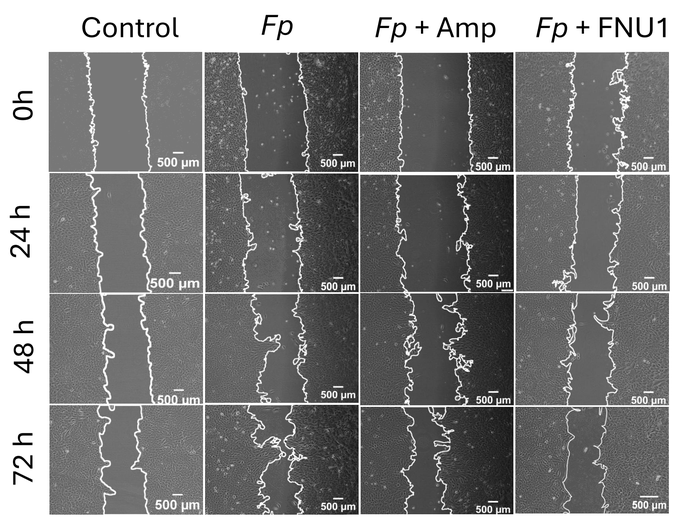


Fig 3. Representative scratch assay images of OECM-1 cells at 0, 24, 48 and 72 h following treatment (*Fp* used at MOI 30).

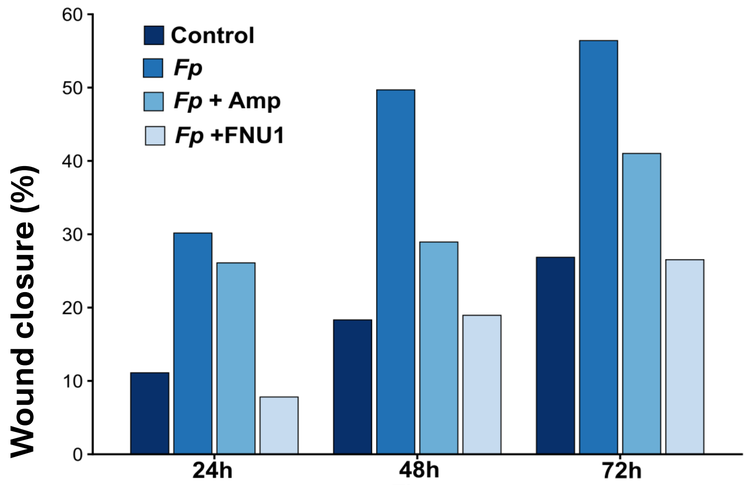


Fig 4. Preliminary scratch assay data demonstrating the effects of *Fp* (MOI 30), ampicillin and FNU1 on OECM-1 cell migration (n=2)

6. KEY FINDINGS

- *Fp* increased OECM-1 proliferation in an MOI-dependent manner.
- Both FNU1 & ampicillin reduced *Fp*-induced OECM-1 proliferation & migration. FNU1 showed greatest inhibitory effect.

7. CONCLUSIONS

Fp promotes the proliferation and migration of OECM-1 oral squamous cell carcinoma cells in vitro. While both ampicillin and bacteriophage FNU1 reduced these effects, FNU1 demonstrated promising therapeutic potential as a targeted approach to counter microbiome-driven cancer progression.

8. FUTURE WORK

- Investigate *Fp* induced OECM-1 proliferation and migration following treatments with chemotherapeutics (5-FU and cisplatin) ± FNU1.
- Investigate underlying molecular mechanisms of *Fp* induced effects.

REFERENCES & IMAGE ATTRIBUTION

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Tucci Microbiomics and Phageomics Lab
***s.rehan@latrobe.edu.au**