

GEORGE MASON UNIVERSITY
COLLEGE OF SCIENCE
BIOLOGY DEPARTMENT SEMINAR
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***“Cranberry extracts have anti-biofilm properties against
Pseudomonas aeruginosa”***

BACKGROUND:

Bacteria within a biofilm are phenotypically more resistant to antibiotics, desiccation, and the host immune system, making it an important virulence factor for many microbes. Cranberry juice has long been used to prevent infections of the urinary tract, which are often related to biofilm formation. Recent studies have found that the A-type proanthocyanidins from cranberries have anti-biofilm properties against *Escherichia coli*.

METHODS:

Using crystal violet biofilm staining, resazurin metabolism assays, and confocal imaging, we examined the ability of A-type proanthocyanidins (PACs) to disrupt the biofilm formation of *Pseudomonas aeruginosa*. We used mass spectrometry to analyze the proteomic effects of PAC treatment. We also performed synergy assays and in vitro and in vivo infections to determine whether PACs, alone and in combination with gentamicin, could contribute to the killing of *P. aeruginosa* and the survival of cell lines and *G. mellonella*.

RESULTS:

Cranberry PACs reduced *P. aeruginosa* swarming motility. Cranberry PACs significantly disrupted the biofilm formation of *P. aeruginosa*. Proteomics analysis revealed significantly different proteins expressed following PAC treatment. In addition, we found that PACs potentiated the antibiotic activity of gentamicin in an in vivo model of infection using *G. mellonella*.

CONCLUSIONS:

Results suggest that A-type proanthocyanidins may be a useful therapeutic against the biofilm-mediated infections caused by *P. aeruginosa* and should be further tested.

TUESDAY March 29, 2016

3:00-4:15 PM

Fairfax Campus: Innovation Hall Room 334

Science & Technology Campus: OCC 221