



# COM Research Day

Saturday  
March 27, 2010  
8:00 a.m. – 4:00 p.m.

Dana Conference Center



## Instruction for Posters

1. All faculty members and residents of UT COM are invited to present posters (one poster/individual). Post-doctoral fellows and medical and graduate students can participate in their mentors' posters.
2. You may present one or more ongoing research projects in your lab/clinic – please avoid technical details. The projects can be basic science, translational, and/or clinical.
3. You may present your plan(s) for future research without any data. Your poster can be used to facilitate discussion for future collaboration.
4. Poster size: 44" x 44". Mounting materials will be provided.
5. All posters will be displayed from 8 a.m. to 4 p.m. They will be clustered into six fields to promote discussions:
  - Cardiovascular & Metabolic Diseases (Poster #101 to 199)
  - Neurosciences (Poster #201 to 299)
  - Cancer Biology (Poster #301 to 399)
  - Infection, Immunity & Transplantation (Poster #401 to 499)
  - Orthopaedic & Biomedical Engineering (Poster #501 to 599)
  - Other Scientific & Clinical Areas (Poster #601 to 699)
6. Please install your poster on Friday, March 26<sup>th</sup> (3 to 6 p.m.) or on Saturday, the 27<sup>th</sup> (7 to 8 a.m.).
7. Please be at your poster from 1:15 to 2:00 p.m. (odd poster numbers) or from 2:00 to 2:45 p.m. (even poster numbers).
8. Please remove your poster by 6 p.m. on Saturday, March 27<sup>th</sup>.
9. Poster presentation requires pre-registration at the CME registration website ([cmevents.utoledo.edu/eventschedule.html](http://cmevents.utoledo.edu/eventschedule.html)) by Friday, March 5<sup>th</sup> deadline. No abstract submission is required.

# Basic Sciences Poster Example



## Synergistic Induction of Inflammation by Bacterial Products: An Important Pathogenic Mechanism

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### Introduction



Most research on the induction of inflammation has been focused on understanding how inflammation is induced by a single bacterial product.

This is unlike the situation *in vivo* where multiple bacterial products are present concurrently at sites of infection and inflammation.

### The Problem

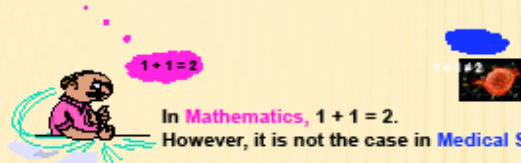
Whether mixtures of bacterial products would have a significant impact on inflammation?

### Hypothesis

Inflammation is regulated by multiple bacterial products that operate synergistically by activating multiple signaling pathways, and that this synergy is likely to play a significant role in the induction of host defense to bacterial infections and in the pathogenesis of inflammatory disorders.

### Funding

This work was supported by National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) Grants RO1 A043524 and RO1 HL89425.



In **Mathematics**,  $1 + 1 = 2$ .  
However, it is not the case in **Medical Science**.

### Results 1

#### Fig. 1. Bacterial Products Synergistically Enhance mRNA of TNF $\alpha$

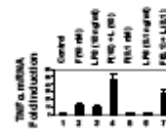
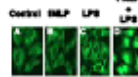


Fig. 1. THP1 cells were stimulated with the indicated stimulators and harvested for total RNA extraction. cDNA reverse transcribed from the RNA was used in QRT-PCR. Cells were incubated with both MLP (10 nM) and LPS (10 ng/ml) in lane 4, and MLP (0.1 nM) and LPS (0.1 ng/ml) in lane 7. F: MLP, L: LPS.

#### Fig. 2. Bacterial Products Synergistically Activate NF- $\kappa$ B

Fig. 2. Bacterial products synergistically activate translocation of p65 using immunofluorescent staining assay. Raw 264.7 cells were stimulated with media (A), 0.1 nM MLP (B), and 0.1 ng/ml LPS (C). D: Raw cells were incubated with both MLP (0.1 nM) and LPS (0.1 ng/ml).



### Results 2

#### Fig. 3. Bacterial Products Synergistically Enhance Protein of TNF $\alpha$

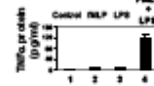


Fig. 3. THP1 cells were stimulated with media, 0.1 nM MLP, 0.1 ng/ml LPS, and 0.1 nM MLP + 0.1 ng/ml LPS for 8 hours. The supernatants were collected, and the secreted TNF $\alpha$  was measured by ELISA. Results shown are the mean  $\pm$  SEM from three separate measurements.

#### Fig. 4. Synergistic Activation of TNF $\alpha$ by Bacterial Products may be Mediated by NF- $\kappa$ B

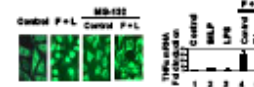


Fig. 4. MG-132, an NF- $\kappa$ B translocation inhibitor, blocks NF- $\kappa$ B translocation (left) and TNF $\alpha$  expression (right) induced by MLP & LPS. F: MLP (0.1 nM); L: LPS (0.1 ng/ml).

### Laboratory models and expertise

Human leukocytes, mouse macrophages

Real Time PCR, *in vitro* culturing, cytokine release, immunochemistry and immunofluorescence

### Summary

- Bacterial products stimulate activation of NF- $\kappa$ B and TNF $\alpha$  production in THP1 cells.
- Mixtures of bacterial products act synergistically in the production of TNF $\alpha$ .
- The mechanism of synergistic activation of TNF $\alpha$  may involve in NF- $\kappa$ B.

### Significance of Research

- An important pathogenic phenomenon occurring during bacterial infection
- This synergy is likely to play a significant role in the induction of host defense and in the pathogenesis of inflammatory disorders.

### Clinical Impact of Research

- the control of inflammation is likely best understood at the level of synergistic regulation of intracellular signaling.
- The use of pharmacological inhibitors to modulate synergistic molecules is therefore an attractive possibility for the treatment of inflammatory diseases.

