



Department of Internal Medicine  
**2007 Research Day**  
 Abstract Form

**BRODY**  
 SCHOOL of MEDICINE

**DEADLINE MONDAY, MARCH 26, 2007, 5:00 P.M.**  
 Email abstract to Tim Johnson, PhD, johnsonti@ecu.edu

**PLEASE NOTE**

Your abstract must fit in the text box to the right using Arial font, 9 point type. Please see the submission guidelines for more information on properly submitting your abstract.

*You may not change the size of the text box, alter the format, adjust the font, type size, etc.*

Failure to follow these formatting instructions may delay acceptance or disqualify your abstract.

Formatting questions?  
 Call Belinda Perkinson  
 at 744-3451.

**CARDIAC-LIKE CALCIUM TRANSIENTS IN LIVER STEM CELLS CO-CULTURED WITH CARDIAC MYOCYTES**

BJ Muller-Borer, WE Cascio, GL Esch, DW Graff, JJ Lemasters, PAW Anderson, JW Grisham, NN Malouf

**Background:** Cells from a clonal liver stem cell line, WB F344, when cultured in an ex vivo cardiac microenvironment, acquire a cardiac phenotype and express cardiomyocyte (CM) specific proteins. The focus of this investigation was to elucidate mechanisms which account for this change to a cardiac phenotype. Recent evidence suggests that oscillatory cytosolic calcium (CA<sub>2</sub><sup>+</sup>) signals induce gene transcriptional responses. In addition, intercellular transmission of CA<sub>2</sub><sup>+</sup> ions via gap junctions (GJ) provides for direct signaling between adjacent cells. As WB F344 cells express connexin 43 (Cx43), and are coupled functionally with CMs, we tested the hypothesis that signals, such as CA<sub>2</sub><sup>+</sup> crossing from WB F344 cells via intercellular channels. **Methods:** Neonatal rat ventricular CMs were co-cultured with WB F344 cells. CA<sub>2</sub><sup>+</sup> signals were recorded within 4 hours with fluorescence microscopy. Next, cultures were treated with 100 pM carbenoxolone (CARB), a gap junction blocker, or 1pM nifedipine, a Ca<sub>2</sub><sup>+</sup> channel antagonist. **Results:** Ca<sub>2</sub><sup>+</sup> transients were recorded in WB F344 cells adjacent to neonatal myocytes in co-culture. No Ca<sub>2</sub><sup>+</sup> transients were recorded in control WB F344 cultures. In co-cultures, exposure to 100 pM CARB abolished Ca<sub>2</sub><sup>+</sup> transients in WB F344 cells. CARB had minimal affect on the frequency, amplitude or duration of Ca<sub>2</sub><sup>+</sup> transients in adjacent CMs. Exposure to 1 pM nifedipine abolished Ca<sub>2</sub><sup>+</sup> transients in WB F344 cells and adjacent CMs in co-culture. Immunocytochemistry shows that Cx43 is localized at shared borders between the WB F344 cells and adjacent CMs. **Conclusions:** These findings suggest that cardiac-like Ca<sub>2</sub><sup>+</sup> transients in the WB F344 cells represent a signal crossing from the CM to the WB F344 cells via functional GJs. We speculate that the cardiac-like Ca<sub>2</sub><sup>+</sup> transients induced in the WB F344 cells from adjacent CMs may have a cardiac-specific signature that induces cardiac-specific gene transcription in the WB F344 cells.

**Presenting Author Designation:**

- Student \_\_\_\_\_
- Resident \_\_\_\_\_
- Fellow \_\_\_\_\_
- Faculty \_\_\_\_\_
- Staff \_\_\_\_\_
- Other \_\_\_\_\_

**Presentation Preference**

- Oral Presentation Only (CME Disclosure Form REQUIRED)
- Poster Presentation Only (CME Disclosure Form NOT REQUIRED)
- No Preference (CME Disclosure Form REQUIRED)

Download Disclosure Form from <http://www.ecu.edu/internalmed>  
 Forward completed form to Timothy Johnson, PhD, Brody 3E116C

**Presenting Author Information (underlined author above)**

Name & Degrees: \_\_\_\_\_ Phone/Pager: \_\_\_\_\_  
 Department: \_\_\_\_\_ Email: \_\_\_\_\_  
 Office Address: \_\_\_\_\_