

9th ANNUAL DEPARTMENT OF PATHOLOGY YOUNG INVESTIGATORS' DAY  
POSTER SESSION

Thursday, April 5<sup>th</sup>, 2007  
TURNER CONCOURSE  
**REGISTRATION FORM**

E-mail COMPLETED Registration form and abstract to:  
Stacey Morgan ([smorgan9@jhmi.edu](mailto:smorgan9@jhmi.edu)) on or before  
**Friday, March 16th, 2007**

If you have questions or problems regarding your submission, please contact Stacey Morgan via e-mail ([smorgan9@jhmi.edu](mailto:smorgan9@jhmi.edu))

Applicant's Name: Zsolt Jobbagy \_\_\_\_\_ Degree: MD PhD \_\_\_\_\_

Applicant's Division: **Laboratory of Molecular Microbiology**

Faculty Preceptor: Alexandra Valsamakis MD, PhD \_\_\_\_\_  
(Must hold a primary appointment in Pathology)

Appointment Category: \_\_\_\_\_ House Staff  Clin Fellow \_\_\_\_\_ Research Fellow  
\_\_\_\_\_ Medical Student \_\_\_\_\_ Graduate Student (Program: \_\_\_\_\_)

Register for:  Clinical Research \_\_\_\_\_ Translational Research \_\_\_\_\_ Basic Research

Full Poster Title \* Characterization of culture sensitivity and viral load in genital specimens: evidence to support selective use of nucleic acid testing for the diagnosis of genital herpes  
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Where has the work been presented?

Meeting Name \_\_\_\_\_

Meeting Date \_\_\_\_\_

Not Previously Presented  \_\_\_\_\_

Where is this work being published? \_\_\_\_\_

Journal Name, Volume, Page, Date \_\_\_\_\_

In Preparation  \_\_\_\_\_

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**\*INCLUDE A ONE-PAGE ABSTRACT (including title and all authors) OF THE WORK YOU WILL BE PRESENTING**

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**Characterization of culture sensitivity and viral load in genital specimens: evidence to support selective use of nucleic acid testing for the diagnosis of genital herpes.**

Z. Jobbagy, M.S. Forman, R. Alcabasa, and A. Valsamakis

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**Background:** The Centers for Disease Control recommends laboratory testing to confirm genital herpes infection since history and physical exam lack sensitivity and specificity. Viral culture is the diagnostic gold standard. Nucleic acid amplification tests (NAATs) such as PCR are reported to be more sensitive than culture. The utility of testing all genital specimens by NAAT has not yet been established. Application of sensitive methodology may not be necessary for all samples since viral loads are likely to be quite high and detectable by culture in most specimens. Also, addition of genital specimen testing to a diagnostic menu that includes HSV detection in cerebrospinal fluid (CSF) for the diagnosis of HSV encephalitis raises the potential for false positive test results in the latter specimen. Compared to CSFs, the prevalence of HSV is much greater and viral loads are likely to be higher in genital specimens. Contamination of CSF specimens with HSV DNA from genital specimens could easily occur during specimen handling, nucleic acid extraction, and NAAT reaction set-up and would have significant diagnostic and therapeutic consequences. Our hypotheses are that 1) a minority of culture negative samples (<50%) are false negative and 2) false negative specimens have lower viral loads than culture positive samples.

**Aims:** To utilize a quantitative HSV DNA test to address the following experimental questions: 1) what proportion of specimens are false negative by culture *and* 2) whether viral loads in specimens that were false negative by culture were lower than specimens that were culture positive.

**Study Design:** Genital specimens that were negative by modified HSV culture method (N=84) were tested by real time quantitative PCR. PCR positive/culture negative specimens were verified by repeating culture, by performing a second real time HSV PCR non-typing assay, that amplified an alternative HSV target and a typing HSV PCR assay to distinguish HSV-1 from HSV-2. Viral loads from culture negative specimens were compared to a randomly selected set of culture positive specimens (N=22).

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**Results:** No HSV DNA was detected in 67/84 (80%) of culture negative specimens. Six of 17 PCR positive samples were positive for HSV after repeat culture. The false negative rate for one round of culture was 20% and for two rounds was 13%. Ten of 11 specimens that were negative twice by culture but positive by PCR were confirmed using the alternate non-typing PCR assay. Mean viral loads in specimens that were negative twice by culture were lower than the randomly selected set of culture positive specimens (2.04 vs. 4.98 log<sub>10</sub> copies/reaction, p<0.0001) and than specimens that were positive after confirmatory culture (2.04 vs. 4.13 log<sub>10</sub> copies/reaction, p<0.0001).

**Conclusions:** These data support our hypotheses that most genital specimens are positive by culture and that samples that are false negative by culture have lower viral loads than culture positives. Additionally, these findings support the implementation of a testing algorithm that reserves HSV NAAT only for genital specimens that are negative by culture. This conservative testing approach could potentially limit false positive CSF results by decreasing the number of tested genital specimens and limiting testing to those samples that are likely to have lower viral loads.