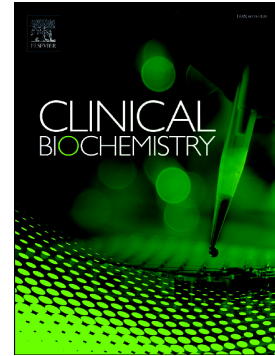


Accepted Manuscript

Glucose-6-phosphate dehydrogenase enzyme stability in filter paper dried blood spots

Sharon R. Flores, Elizabeth M. Hall, Víctor R. De Jesús



PII: S0009-9120(17)30228-X
DOI: doi: [10.1016/j.clinbiochem.2017.05.003](https://doi.org/10.1016/j.clinbiochem.2017.05.003)
Reference: CLB 9539
To appear in: *Clinical Biochemistry*
Received date: 6 March 2017
Revised date: 3 May 2017
Accepted date: 3 May 2017

Please cite this article as: Sharon R. Flores, Elizabeth M. Hall, Víctor R. De Jesús , Glucose-6-phosphate dehydrogenase enzyme stability in filter paper dried blood spots, *Clinical Biochemistry* (2017), doi: [10.1016/j.clinbiochem.2017.05.003](https://doi.org/10.1016/j.clinbiochem.2017.05.003)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Glucose-6-phosphate Dehydrogenase Enzyme Stability in Filter Paper Dried Blood Spots

Sharon R. Flores*, Elizabeth M. Hall and Víctor R. De Jesús

Newborn Screening and Molecular Biology Branch, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA

*Corresponding author at: 4770 Buford Hwy.NE, Atlanta, GA 30341, USA. Fax: +1 770 488 7459.

E-mail address: fil4@cdc.gov (Sharon Flores).

Abbreviations: G6PD, Glucose-6-phosphate Dehydrogenase; DBS, Dried Blood Spot; CDC, Centers for Disease Control and Prevention; NSQAP, Newborn Screening Quality Assurance Program; PT, Proficiency Testing; RUSP, United States Recommended Uniform Screening Panel

Highlights:

- Glucose-6-phosphate dehydrogenase dried blood spots are stable at -20°C for a year
- Humidity exacerbates decline in enzyme activity with increasing temperature
- Glucose-6-phosphate dehydrogenase proficiency testing materials are available

Abstract

Objective: Prior to initial distribution of Glucose-6-phosphate dehydrogenase (G6PD) proficiency testing (PT) materials, we evaluated G6PD enzyme stability in dried blood spots (DBS) under various temperature and humidity environments to develop storage and usage guidelines for our new materials.

Design & Methods: We prepared fresh G6PD-normal DBS materials and conducted stability evaluations of daily use and short and long-term storage under various temperature and humidity environments.

Results: G6PD DBS PT materials retained 92% of initial activity after 30 days of use at 4°C. Materials stored at -20°C and 4°C with desiccant for 30 days retained 95% and 90% of initial activity, respectively. When stored for one year at -20°C or six months at 4°C specimens retained >90% of initial activity. Specimens stored at 37°C with desiccant lost 10% activity in three days. At the end of 30 days, specimens stored under 'Extreme'—humidity >50% without desiccant—conditions at 37°C assayed below the NSQAP cut off for G6PD. Humidity exacerbated loss of enzyme activity with increasing temperature and time duration.

Conclusion: Data suggest that G6PD PT materials can be stored at 4°C and used for up to one month and can be stored at -20°C for one year and yield >90% enzyme activity. Exposure to warm temperatures, especially with elevated humidity, should be avoided. Desiccant should always be used to mitigate humidity effects.

Keywords: Glucose-6-phosphate Dehydrogenase; Newborn Screening, Dried Blood Spot; Proficiency Testing; Stability

Download English Version:

<https://daneshyari.com/en/article/5510179>

Download Persian Version:

<https://daneshyari.com/article/5510179>

[Daneshyari.com](https://daneshyari.com)