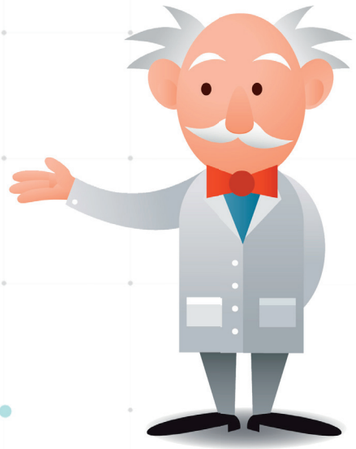
Light protection for Kuhner incubators

Kuhner EquipNote

by Kuhner Shaker



There are various components of cell culture medium that are known to be sensitive to light. Kuhner shaker offers three different solutions to address the issue of light entering through the Shaker Incubator window; a light shade plate, a black window and a black foil. In this application note these solutions are studied in more detail.

Issue: It is generally known that certain medium components, for example riboflavin, will be degraded by visible and ultraviolet light. Riboflavin forms complexes with certain amino acids and results in the production of toxic substances upon light exposure. This is highly reactive towards organic compounds and results in yielding toxic products (Sigma-Aldrich, 2016). Another example is the HEPES buffer where, when exposed to visible light, hydrogen peroxide is produced (Zigler *et al.*, 1985). Phototoxic effects may cause cell death, mutagenesis, DNA crosslinking, and chromatic breaks, this is why it is strongly recommended to keep cell culture media containing those compounds in darkness.

Kuhner's solution: In order to protect medium against light the first obvious advise is not to use the internal lighting of the Shaker Incubator. Secondly Kuhner has developed solutions to prevent light from entering via the Shaker Incubator window:

The Light Shade Plate

The Light Shade Plate is an 100% light blocking barrier that is easily placed in front of the door window of an ISF1-X. It fully protects light sensitive media inside the shaker incubator from UV, artificial and/or daylight. The advantage of the Light Shade Plate is that one can simply lift up the light shade plate to look at the cultures. When light protection is no longer required, the plate is easily removed.

A blackened window

A blackened window is a factory option available for any Kuhner incubator shaker. The blackened window is a permanent solution that fully protects light sensitive media from UV, artificial and daylight. In contrast to the Light Shade Plate cultures cannot be looked at without opening the incubator door. However especially in GMP environments this solution is preferred since it cannot be removed.

Black Foil

A semi-permanent alternative is a window coated with a black foil. Kuhner uses a black foil with a visible light translucency of 5% and a UV-translucency of <1%. This is available for any Kuhner incubator shaker but should be attachment during the production process of the instrument to yield the best result. It can be removed easily when light protection is no longer required but can, however, not be reattached.

Zigler, J.S., Lepe-Zuniga, Jr., J. L., Vistica, B., Gery I. (1985) Analysis of the Cytotoxic Effects of Light-Exposed Hepes-Containing Culture Medium. In Vitro Cellular & Developmental Biology, Vol. 21, No. 5, pp. 282-287.

Sigma-Aldrich (2016) Riboflavin in Cell Culture. [online] Available at: http://www.sigmaaldrich.com/life-science/cell-culture/learning-center/media-expert/riboflavin.html [Accessed 07 July 2016]

Kuhner shaker
www.kuhner.com