

***Antiviral Activity of Engystol® against ADENOVIRUS, Respiratory Syncytial Virus AND INFLUENZA A VIRUS: an in VITRO Analysis***

---

**Authors' names:** Menachem Oberbaum<sup>1</sup>, Bernadette Glatthaar-Saalmüller<sup>2</sup>, Michael Weiser<sup>3</sup>, David Branski<sup>4</sup>.

**Authors' affiliations:** <sup>1</sup> Center for Integrated Complementary Medicine, Shaare Zedek Medical Center, Jerusalem, Israel

<sup>2</sup> Labor Dr. Glatthaar, Reutlingen, Germany

<sup>3</sup> Institut for Antihomotoxische Medizin und Grundregulation, Baden-Baden, Germany

<sup>4</sup> Department of Pediatrics, Hadassah University Hospital, Jerusalem, Israel

**Corresponding author:** Dr. Michael Weiser  
Institut für Antihomotoxische Medizin und Grundregulation, Bahnackerstr. 16,  
D 76532 Baden-Baden, Germany

**Telephone:** +49 (0) 72 21 / 5 01-2 91

**Fax:** +49 (0) 72 21 / 5 01-6 60

**E-mail:** weiser.michael@gmx.de

**Address for reprint requests:** As above.

**Running head:** Oberbaum: Antiviral Activity of Engystol

**Grant supporter(s):** This analysis was supported by an unrestricted grant from HEEL Biologische Heilmittel GmbH.

## **Abstract**

### **Objectives:**

The aim of this study was to investigate the antiviral activity of a commercial preparation of Engystol<sup>®</sup> against three different human viruses: adenovirus type 5 (Ad-5), respiratory syncytial virus (RSV) and influenza A virus (Inf-A).

### **Methods:**

Antiviral activity was assessed using viral protein-specific ELISAs (Ad-5 and RSV) and by plaque reduction assays (Inf-A). HEp-2 cells (Ad-5 and RSV) or MDCK cells (Inf-A) were infected with virus and incubated with non-cytotoxic concentrations of Engystol<sup>®</sup>. Mean optical density (450 nm) for the ELISAs or mean plaque counts were calculated 7 days after infection. Inhibition of viral activity was evaluated relative to control samples. *In vitro* cytotoxicity was investigated using microscopic examination (day 6) and MTT testing (day 5) of cells exposed to serial dilutions of Engystol<sup>®</sup>.

### **Results:**

Engystol<sup>®</sup> (1:2 dilution) was associated with a relative inhibition of Ad-5 activity of 56.95%. Activity against Ad-5 was observed down to a dilution of 1:64. Engystol<sup>®</sup> (1:2 dilution) also demonstrated antiviral activity against RSV (relative inhibition 37.40%). No antiviral activity was observed against Inf-A virus. Cytotoxicity testing demonstrated no detectable toxic effects of Engystol<sup>®</sup> at a dilution of 1:2 on HEp-2 cells and 1:4 on MDCK cells.

### **Conclusions:**

This *in vitro* analysis provides clear evidence of effective inhibition of Ad-5 protein synthesis by the homeopathic preparation Engystol<sup>®</sup>. Minor antiviral activity was observed against RSV and no significant antiviral effects were noted against Inf-A virus. Engystol<sup>®</sup> represents a good candidate for clinical development as a treatment for the common respiratory ailments caused by adenovirus infection.