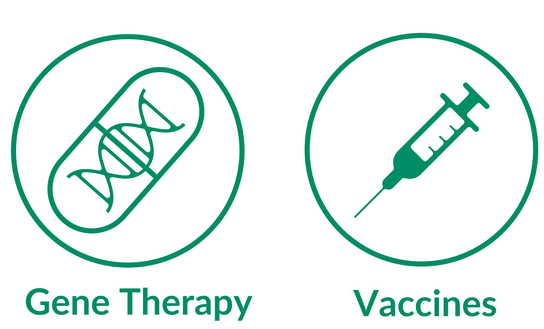
# CAP® Ad – A Scalable and RCA-free Adenoviral Vector Production Platform

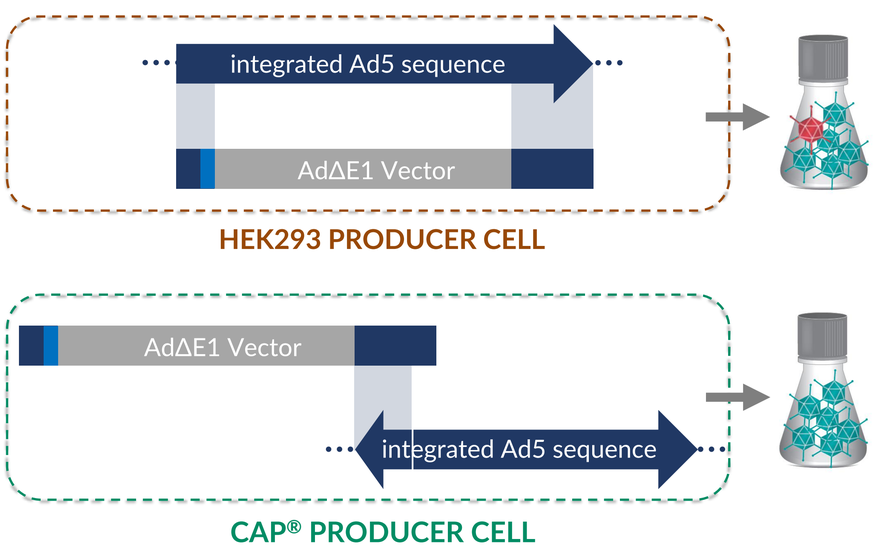
Helmut Kewes & Nico Scheer

## INTRODUCTION

- Adenoviral vectors (Ad vectors) are frequently used as gene delivery tools for gene therapy and vaccines, as they enable an efficient transduction of proliferating and quiescent cells, are very stable and easy to handle, and allow long-term storage
- A major concern with Adenoviral vectors is the formation of Replication-Competent Adenovirus (RCA), which can trigger adverse immune responses and an uncontrolled spread of the virus in the human body
- Here we present the CAP® Ad platform that enables the industrial scale production of Adenoviral vectors without the risk of RCA formation




## RCA-free Production by Design in CAP® Cells



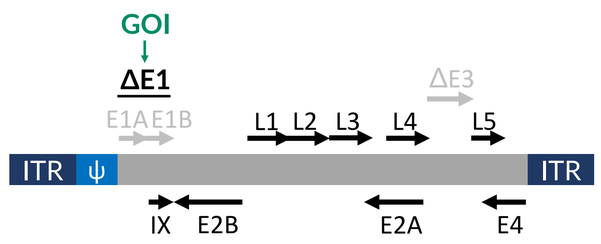

| Cell Line | RCA in 5x10$^{10}$ VP |
|---|---|
| HEK293 | 5-500 |
| CAP® | None |

Courtesy of SIRION BIOTECH GmbH (part of PerkinElmer)

- CAP® cells contain only one short and inverted region of homology to the AdΔE1 vector, minimizing the risk for homologous recombination and RCA formation
- No detection of RCAs in CAP® cell derived material

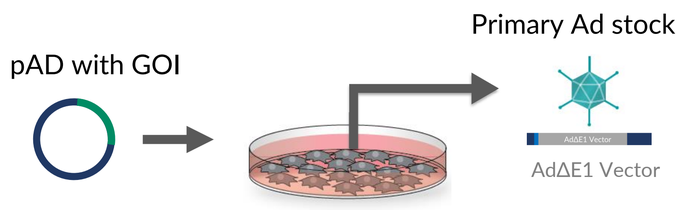
## Vector Construction & Viral Stock Production with CAP® Ad Platform

**Ad Vector Construction**



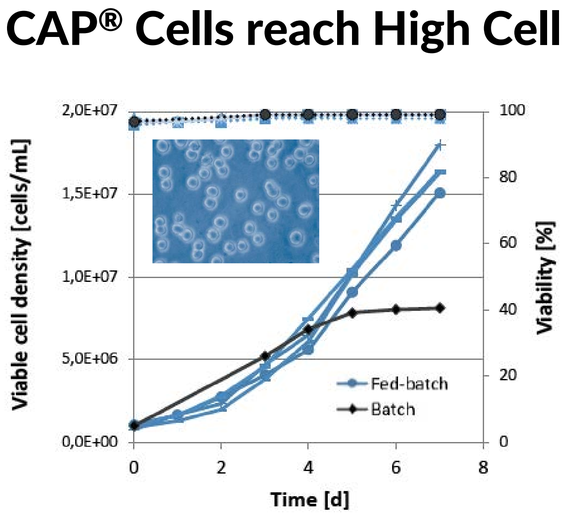

In a typical AdΔE1 vector design the E3 region is removed and the E1 region is replaced with the GOI

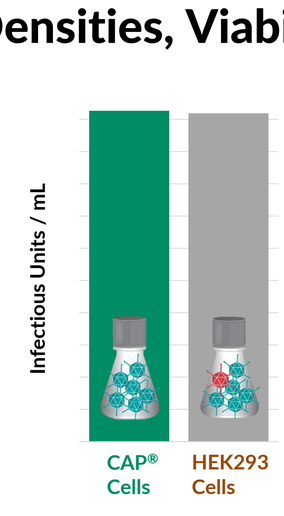
**Primary Ad Stock Production**




Primary vector stock is produced by transfection of the linearized vector and trans-complementation of the E1 function in CAP® cells

## CAP® Cells reach High Cell Densities, Viabilities and Productivities

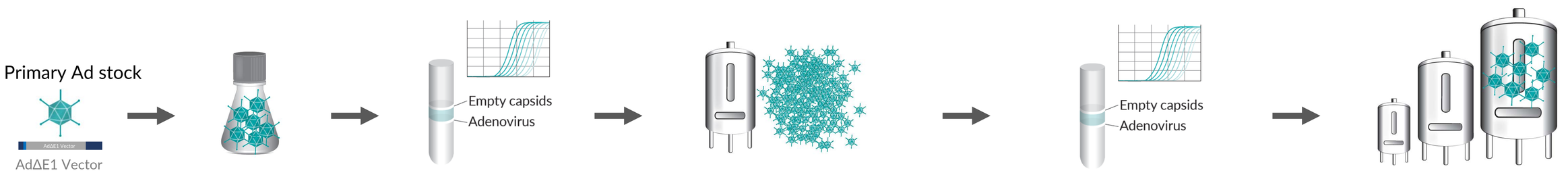



- CAP® cells are designed and recognized as ideal producer cell lines for biotherapeutics
- Suspension cell lines, derived from human amniocytes
- Variety of ACF media available
- Cell densities up to 15-20 million cells per mL in fed-batch with high viabilities
- High productivity of RCA-free Ad vectors in CAP® cells

## Industrial Scale Manufacturing with the CAP® Ad Platform

**Viral Vector Amplification & Seed Stock Production** | **Large-Scale GMP production**




Infection and steps of amplification in CAP® suspension cells, purification, concentration and titration

WVSS & MVSS prepared in GMP-grade CAP® cells

Purification, concentration, titration and QC testing

Scale-up using GMP-grade CAP® suspension cells

## SUMMARY

- CAP® Ad represents a unique platform for industrial scale manufacturing of Adenoviral vectors as it minimizes the risk for RCA formation throughout the entire manufacturing process
- The CAP® cell line as the basis of the CAP® Ad platform is available as a GMP bank; a Biologics Master File has been deposited with the FDA and can be referenced
- Cells grow in suspension to high densities using ACF media in various modes and scales, including fed-batch and perfusion and produce Adenoviral vectors with high productivities

CAP® Ad

CEVEC Pharmaceuticals GmbH, Gottfried-Hagen-Straße 60-62, 51105 Cologne, Germany, www.cevec.com

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