

# HEK293 expression platform

## (L-10894/11266/11565)

### Highlights

There is an increasing demand for biopharmaceuticals such as vaccines, humanized monoclonal antibodies, and gene therapy products produced from animal cell culture processes. The NRC's HEK293 expression system enables the high yield production of viral vector and post-translationally modified recombinant proteins through suspension-growing, serum-free adapted cell lines. It provides an optimized, chemically defined formulation for serum-free suspension culture of this cell line. The cell line can be used in combination with the cumate and coumermycin switches, which enable producers to turn on the expression of a given protein only when needed.

### Technology transfer

- › Commercial exploitation licence
- › R&D agreement for development

### Market applications

- › Transient expression of recombinant proteins and viral vectors (adenoviral, adeno-associated viral, lentiviral, and retroviral) for R&D purposes
- › Fully scalable stable and transient expression of recombinant proteins, viral vectors, and lead candidates for R&D and commercial purposes, up to 500 L
- › Custom cell line development for lead candidates

### How it works

#### HEK 293SF-3F6 cell line

A stepwise approach was employed to select a serum-free adapted clone

(293SF-3F6) from a suspension-growing derivative of the human embryonic kidney cell line HEK293. A preferred commercially available serum-free media was also identified.

#### HEK 293EBNA1-6E cell line

Shorter, functional forms of EBNA1 reduced the difficulty of obtaining stable clones, allowing the isolation and characterization of a new 293EBNA1 cell line, 293-6E, that stably expresses a truncated EBNA1 protein. Further enhancement of r-protein expression was achieved by co-expression of selected genes *in cis* or *trans*. Use of an expression cassette for transient co-expression of truncated forms of EBNA1 *in cis* or *in trans* increased r-protein production in 293EBNA1 and non-EBNA1 cells as well as in the new 293-6E cell line. A modified serum-free medium amended by the addition of various additives was shown to increase r-protein and viral vector production.

### Benefits

- › High yield, low cost protein production for research and biomanufacturing
- › Transient or stable expression
- › Family of validated pTT vectors
- › Choice of proprietary cell lines or custom cell line development to best suit your expression needs
- › Master cell bank documentation for commercial production (293SF-3F6)
- › Two switches (cumate and coumermycin) allow you to turn on and

off the expression of a given gene during production

- › Serum-free media enables easy recovery of recombinant proteins
- › Compatible with commercially available feeds; custom fed batch development

### Patents

#### NRC file 11266 (vector/cassette):

Patents granted in Canada, Europe and Singapore, pending in the United States.

**NRC file 10894 (HEK 293SF-3F6 cell line):** Patents granted in Canada and the United States.

**NRC file 11565 (HEK 293EBNA1-6E cell line):** Patents granted in the United States, pending in Canada, Europe and Singapore.

**NRC file 11225/11648 (Cumate switch):** Patents granted in Canada, the United States, and Europe.

**NRC file 11444 (Coumermycin switch):** Patents granted in Canada, the United States, Europe, Australia, New Zealand, and Japan.

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