



Optimized analytical methods are key components of a well-functioning analytical system, while method development usually comes with a time-consuming learning curve and optimization.

PATfix pDNA analytics platform, designed for in-process control of linear pDNA production, enables monitoring of pDNA linearization progression, as shown in Figure 1. Fully optimized and validated analytical methods, as well as guidelines for buffer and sample preparation come as part of the HPLC system, allowing users to focus on their specific application. In addition, the PATfix pDNA analytical package includes a pDNA calibration standard, which enables accurate quantification of the pDNA species of interest.

Example: In-process monitoring of plasmid purification and linearization for the purpose of mRNA production.

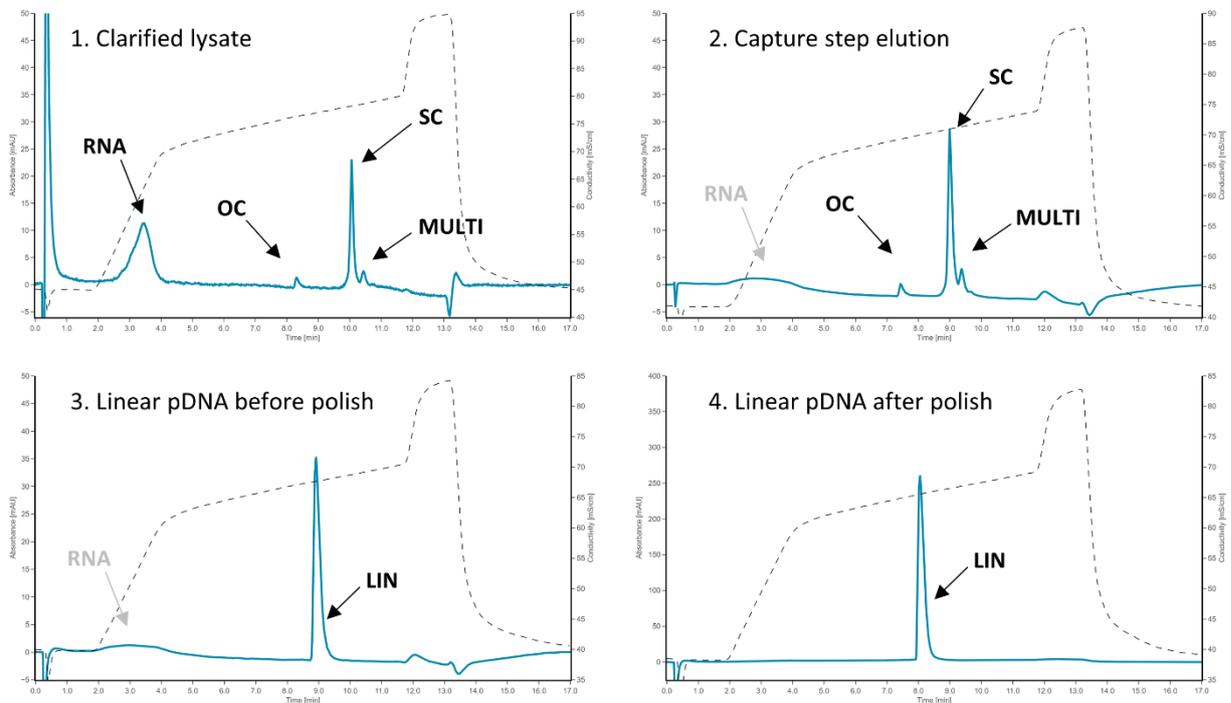


Figure 1: PATfix pDNA application for in-process control of linear plasmid preparation. Analytical chromatography was performed using a PATfix pDNA optimized method on the CIMac™ pDNA analytical column (cat. # 150.8501-1.4). The blue line shows the 260 nm UV signal, while the dashed black line shows the conductivity. Chromatograms from the most complex (graph 1) to the simplest sample (graph 4) are shown.

A key step in mRNA production is linearization of plasmid DNA, which is utilized as a template for the IVT reaction. For efficient transcription in the IVT reaction, it is crucial to remove contaminants e.g. RNA, host cell proteins, before plasmid DNA linearization. Unwanted contaminants can create additional impurities, complicating downstream process (DSP) purification and leading to poor yields of the mRNA product.

Applying PATfix pDNA analytical methods at different stages of linear plasmid production, allows fast and precise monitoring of contaminants removal (RNA, host cell proteins) as well as degradation products (OC or multimer pDNA). This ensures that each production step in plasmid preparation is correctly optimized during the process development (PD) stage as well as performing optimally during production.

PATfix pDNA analytics can be used to determine the initial plasmid concentration in the cell harvest providing production yields and losses at every step (Figure 2).

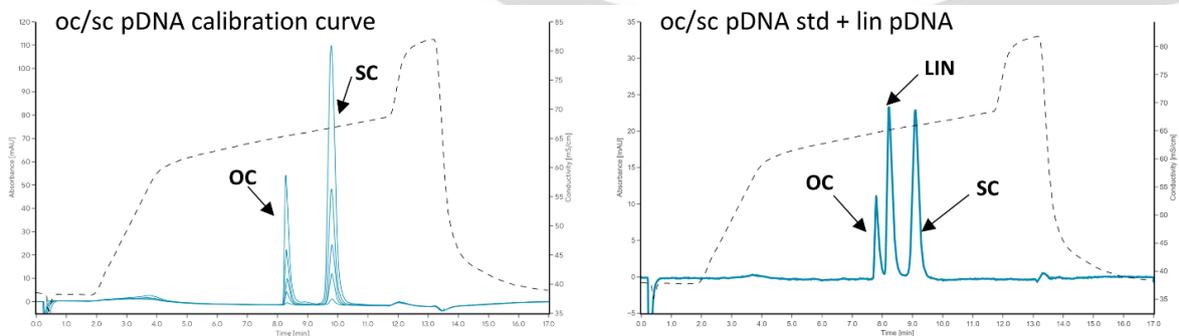


Figure 2: pDNA calibration standard for quantification of OC and SC isoforms (left) and separation of key species (right). The blue line shows the 260 nm UV signal, while the dashed black line shows the conductivity.

CONCLUSIONS

The PATfix pDNA analytical platform allows for monitoring of key process parameters during process development and production of linear pDNA. With the included calibration standard, absolute quantification of pDNA isoforms can be measured.

When used as part of a complete production process, each in-process control check is completed in less than 20 minutes (Figure 1), speeding up process development and cutting down on lengthy lag times during pDNA downstream processing.

PATfix pDNA application enables the separation of many pDNA conformations (oc/sc/lin/multi), allowing for product quality control that leads to more predictable production runs.



For any additional information please contact us:

Tel.: +386 5 9699 500

sales@biaseparations.com

www.biaseparation.com

Information and specifications contained here are, to the best of our knowledge, accurate and represented in good faith. They are intended to help you start working with this new separation technology and are subject to change without notice. BIA Separations shall not be liable for errors contained herein or for incidental or consequential damages in connection with the performance of use CIM. For more information on our products, visit our home page at: <http://www.biaseparations.com> or contact your local distributor. We reserve the right to alter the specification detail etc. without prior notice or liability.