Medicine | Pharmacology | Technology Offer

Fluorescence-based monitoring of the ribosomal activity to optimize yield from recombinant proteins

Application and state of the art

In vitro transcription/translation systems (ivtt) are used in biotechnology mainly to produce recombinant proteins whose production in vivo would be toxic. The reliable implementation of the assay often requires a lengthy optimization process. The experimental analysis normally involves autoradiography, i.e. it requires the labelling of translation products with radioactive isotopes. Handling these isotopes is expensive, a potential health hazard and limits throughput.

Innovation

Scientists at the University of Konstanz have recently succeeded in producing stable bacterial strains with ribosomal subunits incorporating fluorescent markers which have growth characteristics similar to wild type and which have an intact translation apparatus. The positioning of fluorophores allows the quantification of the translation activity through Förster Resonance Energy Transfer (FRET). Ribosomes isolated from these bacterial strains could be used in ivtt approaches instead of wild-type ribosomes, to which they are functionally comparable. By measuring the translation activity in real time using fluorescence, it is possible to carry out experiments in a shorter time and at less cost in multi-well plates, varying several reaction parameters (DNA and salt concentration etc.) in parallel to optimize yield.

The fluorescent ribosomes are formed in vivo with 100 % labelling efficiency and can therefore be isolated for use in ivtt systems in any quantity and with constant quality.

Market

The worldwide market potential of a novel fluorescence-based ivtt system for the monitoring of ribosomal activity and the optimization of the yield of recombinant proteins is believed to be substantial.

Advantages

- ✓ Novel ivtt system using fluorescently labelled ribosomes
- ✓ Quantification of the translation activity using FRET
- ✓ Possibility to standardize the process: time saving and cost minimizing application using multi-well plates
- ✓ Optimizing protein yield, because several reaction parameters can be varied simultaneously

Technology transfer

The Technologie-Lizenz-Büro GmbH is charged with the commercialisation of this technology and is now offering suitable enterprises licenses for the use of this technology.

Patent portfolio

EP and PCT applications are pending.
The patent applications cover two distinct uses; for details, see technology offer “In vivo screening based on fluorescence to identify novel antimicrobial substances”.

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