

Aspekte der synthetischen Biotechnologie

Kumulative Habilitationsschrift

Zur Habilitation vorgelegte Arbeiten

Teil II: Schriftensammlung

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NCBI, GenBank Acc. No. KF983531, (2014)..... A

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S. Hartwig, T. Frister, S. Alemdar, Z. Li, U. Krings, R.G. Berger, T. Scheper, **S. Beutel**:

Expression, purification and activity assay of a patchoulol synthase cDNA variant fused to thioredoxin in *Escherichia coli*.

Protein Expression and Purification (2014), 97C, 61-71..... B

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T. Frister, S. Hartwig, S. Alemdar, K. Schnatz, L. Thöns, T. Scheper, **S. Beutel**:

Characterisation of a Recombinant Patchoulol Synthase Variant for Biocatalytic Production of Terpenes.

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S. Alemdar, S. Hartwig, T. Frister, J.C. König, T. Scheper, **S. Beutel**:

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Applied Biochemistry and Biotechnology (2016), 178(3), 474-489..... D

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S. Alemdar, J.C. König, S. Hartwig, T. Frister, T. Scheper, **S. Beutel**:

Bioproduction of α -humulenein metabolically engineered *Escherichia coli* and application in zerumbon synthesis.

Engineering in Life Science (2017), 17(8), 900-907..... E

Enzymdatenbankeintrag 2

S. Hartwig, T. Frister, S. Alemdar, S., Z. Li, T. Scheper, **S. Beutel**:

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NCBI GenBank Acc. No. KP231534, (2015)..... F

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S. Hartwig, T. Frister, S. Alemdar, Z. Li, T. Scheper, **S. Beutel**:

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Sensors; (2014), 14, 17390-17405..... i

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Online analysis of protein inclusion bodies produced in *E. coli* by monitoring alterations in scattered and reflected light.

Applied Microbiology and Biotechnology (2016), 100 (9), 4147-4159..... J

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New Perspectives in Shake Flask pH Control using a 3D-printed Control Unit based on pH online Measurement.

Sensors and Actuators, B: Chemical (2015), 221, 1035-1043..... K

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3D-printed individual labware in biosciences by rapid prototyping: A proof of principle.

Engineering in Life Science (2015), 15(1), 51-56..... L

Publikation 11

T. H. Lücking, F. Sambale, B. Schnaars, D. Bulnes-Abundis, **S. Beutel**, T. Scheper:

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Engineering in Life Science (2015), 15(1), 57-64..... M

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Applied Microbiology and Biotechnology (2017), 101/2, 599-607..... N

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One-step-purification of penicillin G amidase from cell lysate using ion-exchange membrane adsorbers.

Journal of Membrane Science (2013), 444, 359-364..... O

Buchkapitel 1

S. Beutel, L. Villain, T. Scheper:

Industrial Application of Membrane Chromatography for the Purification of Enzymes.

Chapter 13: 294-313, in Applied Biocatalysis – From Fundamental Science To Industrial Application, 1. Auflage, August 2016. XXVI, 435 Seiten, Wiley-VCH, Weinheim..... P

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A. Glyk, T. Scheper, **S. Beutel:**

Influence of different phase-forming Parameters on the Phase Diagram of several PEG-Salt Aqueous Two-Phase Systems.

Journal of Chemical & Engineering Data, 59(3), 850-859 (2014)..... Q

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A. Glyk, T. Scheper, **S. Beutel**:

Determination of aqueous two-phase system phase-forming components in the presence of bovine serum albumin.

Notes & Tips, Analytical Biochemistry (2014), 455, 10-12..... R

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A.Glyk, S. Heinisch, T. Scheper, **S. Beutel**:

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Notes & Tips, Analytical Biochemistry (2015), 477, 35-37..... S

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A.Glyk, D. Solle, T. Scheper, **S. Beutel**:

Optimization of PEG- salt aqueous two- phase systems by design of experiments.

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Applied Microbiology and Biotechnology (2015), 99(16), 6599-6616..... U

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Cultivation of shear stress sensitive microorganisms in disposable bagreactor systems.

Journal of Biotechnology 167 (2013), 370-376..... W

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Chemie Ingenieur Technik(2011), 83, 12, 2147-2152..... X

Patent 1

J.M. Hilmer, E. Gross, G. Krammer, J. Ley, M. Gall, U. Bornscheuer, M. Thomsen, C. Peters, P. Jonczyk, **S. Beutel**, T. Scherer:

Method for the biotechnological manufacture of dihydrochalcones.

Patent-Nr.: EP 2692729-A1, DE 102012213492-A1 (2014)..... Y