

World's first method for continuous purification of valuable antibodies

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acib researcher Nikolaus Hammerschmidt is shown working at a continuous reactor in lab scale. Credit: acib

Imagine a loved relative suffering from cancer - and you could not afford a treatment because the drugs are too expensive. The Austrian Centre of Industrial Biotechnology (acib) developed a method with the power to reduce production costs of highly valued drugs significantly.

Without antibodies we would be at the mercy of pathogens or [cancer cells](#). Therapeutic antibodies are used as passive vaccines, for cancer therapy or for controlling [autoimmune diseases](#) such as [multiple sclerosis](#). According to "bccresearch.com" the [global market](#) for antibody drugs was worth nearly 70 billion USD in 2014 and should rise to 122 billion USD until 2019.

Two thirds of those molecules are produced biotechnologically using Chinese hamster ovary cells (CHO). Actually the major cost factor for industry is purification using "protein A" affinity chromatography where tens of thousands of liters of culture volume have to be processed annually. About 80 % of the production costs fall upon purification.

Here this new purification method comes into play. Researchers from the Austrian Centre of Industrial Biotechnology (acib) and the University of Natural Resources and Life Sciences Vienna (BOKU) developed the world's first downstream processing method for recombinant antibodies from clarified CHO cultures. From a technical view, the purification method combines a Calcium-Phosphate flocculation with a subsequent cold ethanol precipitation in a tubular reactor realized as a double-pipe heat exchanger that is operated in counter-current flow.

A feasibility study exemplified by the purification of immune globulin G (IgG) shows that the continuous method can compete with "protein A" affinity chromatography in terms of yield and outperforms chromatography according to the speed of operation. A further advantage is that the operation parameters can be easily transferred from the actually used batch to the continuous approach. In combination with a prior concentration step the new method is perfect for purification of low titer supernatants. "Our method shows great potential as a new platform technology for the pharmaceutical industry", says Prof. Alois Jungbauer, who is in negotiations with several international companies

about building pilot plants.

More information: Biotechnology Journal,
[onlinelibrary.wiley.com/doi/10...t.201400608/abstract](https://onlinelibrary.wiley.com/doi/10.1002/biot.201400608/abstract)

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(ACIB)

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