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## Current and future trends in QconCATs

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**P**rotein quantification by targeted proteomics relies on mass spectrometry and isotope-labeled internal standards. In addition to traditional standards comprised of either recombinant proteins or synthetic peptides, artificial proteins composed of concatenated peptides (Q conCATs) have been introduced as a conceptually new material for use as an internal standard. The design, expression, characterization and some application of Q conCATs have been thoroughly described in the set of original papers from Beynon's laboratory. The focus of this presentation is to describe two new trends in the use of Q conCATs as internal standards: (i) the need of natural flanking sequences for every Q-peptide included in the Q conCAT and (ii) the benefits of stoichiometric incorporation of post-translational modifications in the Q conCAT. These developments in Q conCATs have not received much attention so far, but show great promise for future advances in targeted proteomics. On the application side, the focus of this presentation is on expression of various protein isoforms that can be indicative of pathological changes associated with Alzheimer's disease. Selective quantification of individual protein isoforms has been always a challenge, because they simultaneously possess common and unique amino acid sequences. We developed a Q conCAT for quantification of various isoforms of amyloid precursor protein (APP). APP-Q conCAT includes tryptic peptides that are common for all

isoforms of APP concatenated with those tryptic peptides that are unique for specific APP isoforms. Isotope-labeled APP-Q conCAT was expressed, purified, characterized and further used for quantification of total APP, APP695, APP305, and amyloid- $\beta$  in the human frontal cortex from control and severe Alzheimer's disease donors. Potential biological implications of our quantitative measurements are discussed.

### Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a dynasty of medical doctors, graduated from Astrakhan State Medical University and was awarded with MD. Then maintained his PhD and Doctor's Degree. And later was working for Helmholtz Eye Research Institute and Moscow Regional Clinical Research Institute (MONIKI). Dr Suchkov was a Secretary-in-Chief of the Editorial Board, *Biomedical Science*, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr Sergey Suchkov is: A Director, Center for Personalized Medicine, Sechenov University, (ii) Chair, Dept for Translational Medicine, Moscow Engineering Physical University (MPEI) and (iii) Secretary General, United Cultural Convention (UCC), Cambridge, UK. A Member of the: New York Academy of Sciences, American Chemical Society (ACS), American Heart Association (AHA), AMEE, Dundee, UK; EPMA, Brussels, EU; PMC, Washington, DC, USA and ISPM, Tokyo, Japan.

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