

His-rich sequences- is plagiarism from nature a good idea?

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In chemistry, nature-inspired solutions are often the most trivial and effective ones. Histidine rich sequences are used commercially in immobilized metal affinity chromatography (IMAC) as molecular 'anchors' that bind to a metal ion (usually nickel), immobilized by chelation with nitrilotriacetic acid (NTA) bound to a solid support. The typical (His)₆ tag, present at the C- or N-terminus of a protein which is meant to be purified, has been successfully used for decades. Consecutive histidines are the common denominator for both His-tags used in molecular biology and for quite remote biological phenomena – polyhistidine sequences are found in some bacterial chaperones, in Zn²⁺ transporters, prion proteins, in histidine-rich glycoproteins (HRG), which possess a massive amount of functions, in some snake venoms and antimicrobial peptides. This work debates on two questions – first, why were such sequences chosen by nature to exist in some parts of specific, sometimes evolutionally remote proteins, and second, are we right about choosing the polyhistidine motif as the strongest metal binder?

Adres publiczny

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