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BIS(METHYL)GLIOTOXIN PROVES TO BE A STABLE AND RELIABLE BIOMARKER FOR INVASIVE ASPERGILLOSIS AND SUITABLE FOR USE IN DIAGNOSIS

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The virulence factor Gliotoxin (GT) and its inactive derivative, bis(methylthio)gliotoxin (bmGT) are produced by pathogens of the genus *Aspergillus*. Here we report the detection of GT and bmGT in serum of humans at risk of invasive aspergillosis as well as in cultures of fungal isolates derived from patients with proven infection with *A. fumigatus*. Although both compounds are readily recoverable from spiked human serum or plasma, only bmGT is retained in whole blood, indicating that bmGT may be the better biomarker for *in vivo* detection. Accordingly, bmGT was found more frequently than GT in samples from patients at risk of invasive aspergillosis and in cultures of clinical isolates of *A. fumigatus*. In some cases bmGT was detected before mycological evidence of infection was gained. Importantly, neither GT nor bmGT was found in serum from healthy donors. Thus, bmGT presence might provide a more reliable indicator of *A. fumigatus* infections than GT. Due to its simplicity and sensitivity, this test could be easily adopted in clinical laboratories to improve the diagnosis of this often fatal fungal infection.

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T-NOVO MS: PROTEIN SEQUENCING BY TANDEM MASS SPECTROMETRY AS A STATISTICAL-MECHANICS PROBLEM

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We describe a new algorithm for protein sequencing based on the mapping of the tation of tandem mass spectra onto the analysis of the equilibrium distribution of a defined, one-dimensional, discrete physical model. The model is governed by an adiential energy function, derived from the distribution of peaks in a dataset of experimental spectra. The characterization of the zero-temperature solution of the model allows the precursor peptide, while the study of the thermodynamic variables as a function (fictitious) temperature can give insight on the quality of the identification, without decoy databases or on phenomenological distribution of the scores of the false positive method can also be coupled with database search, to improve its performance.