Title (en)

MULTI-CHANNEL PROTEIN VOXELIZATION TO PREDICT VARIANT PATHOGENICITY USING DEEP CONVOLUTIONAL NEURAL NETWORKS

Title (de)

MEHRKANAL-PROTEINVOXELISIERUNG ZUR VORHERSAGE VON VARIANTENPATHOGENITÄT UNTER VERWENDUNG TIEFER KONVOLUTIONALER NEURONALER NETZE

Title (fr)

VOXELISATION DE PROTÉINE À CANAUX MULTIPLES POUR PRÉDIRE UNE PATHOGÉNICITÉ D'UN VARIANT À L'AIDE DE RÉSEAUX NEURONAUX CONVOLUTIFS PROFONDS

Publication

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Application

EP 22726207 A 20220414

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Abstract (en)

[origin: WO2022221591A1] A system includes at least a voxelizer, an alternative allele encoder, an evolutionary conservation encoder, and a convolutional neural network. The voxelizer accesses a three-dimensional structure of a reference amino acid sequence of a protein and fits a three-dimensional grid of voxels on atoms in the three-dimensional structure on an amino acid-basis to generate amino acid-wise distance channels. The alternative allele encoder encodes an alternative allele sequence to each voxel in the three-dimensional grid of voxels. The evolutionary conservation encoder encodes an evolutionary conservation sequence to each voxel in the three-dimensional grid of voxels. The convolutional neural network applies three-dimensional convolutions to a tensor that includes the amino acid-wise distance channels encoded with the alternative allele sequence and respective evolutionary conservation sequences and determines a pathogenicity of a variant nucleotide based at least in part on the tensor.

IPC 8 full level

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