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EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,(54) Title: METHODS AND SYSTEMS FOR IMPROVED MAJOR HISTOCOMPATIBILITY COMPLEX (MHC)-PEPTIDE
BINDING PREDICTION OF NEOEPITOPES USING A RECURRENT NEURAL NETWORK ENCODER AND ATTENTION
WEIGHTING(57) Abstract: Techniques are provided for predicting MHC -peptide binding affinity. A plurality of training peptide sequences is
obtained, and a neural network model is trained to predict MHC -peptide binding affinity using the training peptide sequences. An
encoder of the neural network model comprising an RNN is configured to process an input training peptide sequence to generate a fixed-
dimension encoding output by applying a final hidden state of the RNN at intermediate state outputs of the RNN to generate attention
weighted outputs, and linearly combining the attention weighted outputs. A fully connected layer following the encoder is configured
to process the fixed- dimension encoding output to generate an MHC-peptide binding affinity prediction output. A computing device
is configured to use the trained neural network to predict MHC-peptide binding affinity for a test peptide sequence.