

Semi-supervised Tensor Regression Model for siRNA Efficacy Prediction

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Abstract

Short interfering RNAs (siRNAs) can knockdown target genes and thus have an immense impact on biology and pharmacy research. The key question of which siRNAs have high knockdown ability in siRNA research remains challenging as current known results are still far from expectation. This work aims to develop a generic framework to enhance siRNA knockdown efficacy prediction. The key idea is first to enrich siRNA sequences by incorporating them with rules found for designing effective siRNAs and representing them as enriched matrices, then to employ the bilinear tensor regression to predict knockdown efficacy of those matrices. Experiments show that the proposed method achieves better results than existing models in most cases. Our model not only provides a suitable siRNA representation but also can predict siRNA efficacy more accurate and stable than most of state-of-the-art models. Source codes are freely available on the web at: <http://www.jaist.ac.jp/~bao/BILTR/>

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