

---

## SUPPLEMENTARY MATERIAL

### **Splice2Deep: An Ensemble of Deep Convolutional Neural Networks for Improved Splice Site Prediction in Genomic DNA**

Somayah Albaradei<sup>1,2\*</sup>, Arturo Magana-Mora<sup>1,3\*</sup>, Maha Thafar<sup>1,4</sup>, Mahmut Uludag<sup>1</sup>, Vladimir B. Bajic<sup>1</sup>, Takashi Gojobori<sup>1,5</sup>, Magbubah Essack<sup>1#</sup>, Boris R. Jankovic<sup>1#</sup>

<sup>1</sup>Computer, Electrical and Mathematical Sciences and Engineering Division (CEMSE), Computational Bioscience Research Center, Computer (CBRC), King Abdullah University of Science and Technology (KAUST), Thuwal 23955-6900, Kingdom of Saudi Arabia.

<sup>2</sup>Faculty of Computing and Information Technology, King Abdulaziz University, Kingdom of Saudi Arabia.

<sup>3</sup>Saudi Aramco, EXPEC-ARC, Drilling Technology Team, Dhahran, 31311, Kingdom of Saudi Arabia.

<sup>4</sup>Faculty of Computers and Information Systems, Taif University, Kingdom of Saudi Arabia.

<sup>5</sup>Biological and Environmental Sciences and Engineering Division (BESE), King Abdullah University of Science and Technology (KAUST), Thuwal 23955-6900, Kingdom of Saudi Arabia.

\*First author.

#To whom correspondence should be addressed. Tel: +966 (54) 470 0746; Email: [magbubah.essack@kaust.edu.sa](mailto:magbubah.essack@kaust.edu.sa); Email: [boris.jankovic@kaust.edu.sa](mailto:boris.jankovic@kaust.edu.sa)

---

**Supplementary Table S3.** Accuracy (Acc), Sensitivity (Sn), and Specificity (Sp) from the cross-organism validation obtained by using the *Arabidopsis thaliana* model and testing on the other organisms. N/A indicates that the tool is not available for that specific organism.

Splice site	Model	<i>Homo sapiens</i>			<i>Arabidopsis thaliana</i>			<i>Oryza sativa japonica</i>			<i>Drosophila melanogaster</i>			<i>Caenorhabditis elegans</i>		
		Sp.	Sn.	Acc.	Sp.	Sn.	Acc.	Sp.	Sn.	Acc.	Sp.	Sn.	Acc.	Sp.	Sn.	Acc.
AcSS	Geneslicer	0.9734	0.4175	0.6955	0.9767	0.7785	0.8776	0.9859	0.6837	0.8348	0.9791	0.4178	0.6984	0.9910	0.3950	0.6930
	SplicePredict or	0.9566	0.5229	0.7398	0.9683	0.8744	0.9213	0.9792	0.7902	0.8847	0.9626	0.6496	0.8061	0.9863	0.6287	0.8075
	DeepSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Splicerover	0.8847	0.8837	0.8857	0.9312	0.9402	0.9435	0.9030	0.8745	0.8730	0.8787	0.8502	0.8487	0.9049	0.8764	0.8749
	Splice2Deep	0.8993	0.8983	0.9003	0.9486	0.9553	0.9521	0.9131	0.8846	0.8851	0.8872	0.8587	0.8572	0.9201	0.8916	0.8901
DoSS	Geneslicer	0.9685	0.4222	0.6954	0.9758	0.8412	0.9085	0.9866	0.7439	0.8652	0.9817	0.5466	0.7641	0.9928	0.5252	0.7590
	SplicePredict or	0.9546	0.4266	0.6906	0.9604	0.8894	0.9249	0.9776	0.7551	0.8663	0.9651	0.6444	0.8048	0.9850	0.6846	0.8348
	DeepSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Splicerover	0.8837	0.8827	0.8847	0.9412	0.9502	0.9425	0.9040	0.8755	0.8740	0.8807	0.8522	0.8507	0.9069	0.8784	0.8769
	Splice2Deep	0.8983	0.8973	0.8993	0.9567	0.9550	0.9559	0.9141	0.8856	0.8841	0.8902	0.8617	0.8602	0.9231	0.8946	0.8931