Electronic Supplementary Material (ESI) for Lab on a Chip.

Similar Colors Analysis based on Deep Learning (SCAD) for Multiplex Digital PCR *via* Single Fluorescent Channel

Chaoyu Cao[1,2], Minli You[1,2*], Haoyang Tong[1,2], Zhenrui Xue[2,3], Chang Liu[1,2], Wanghong He[2,4], Ping Peng[2,3], Chunyan Yao[3], Ang Li[4], Xiayu Xu[1,2], Feng Xu[1,2*]

[1] *The Key Laboratory of Biomedical Information Engineering of Ministry of Education, School of Life Science and Technology, Xi'an Jiaotong University, Xi'an 710049, P.R. China*

[2] *Bioinspired Engineering and Biomechanics Center (BEBC), Xi'an Jiaotong University, Xi'an 710049, P.R. China*

[3] *Department of Transfusion Medicine, Southwest Hospital, Third Military Medical University (Army Medical University), Chongqing 400038, P.R. China*

[4] *Key Laboratory of Shaanxi Province for Craniofacial Precision Medicine Research, College of Stomatology, Xi'an Jiaotong University, Xi'an 710049, P.R. China*

[*] *Corresponding authors: youminli@xjtu.edu.cn; fengxu@mail.xjtu.edu.cn*

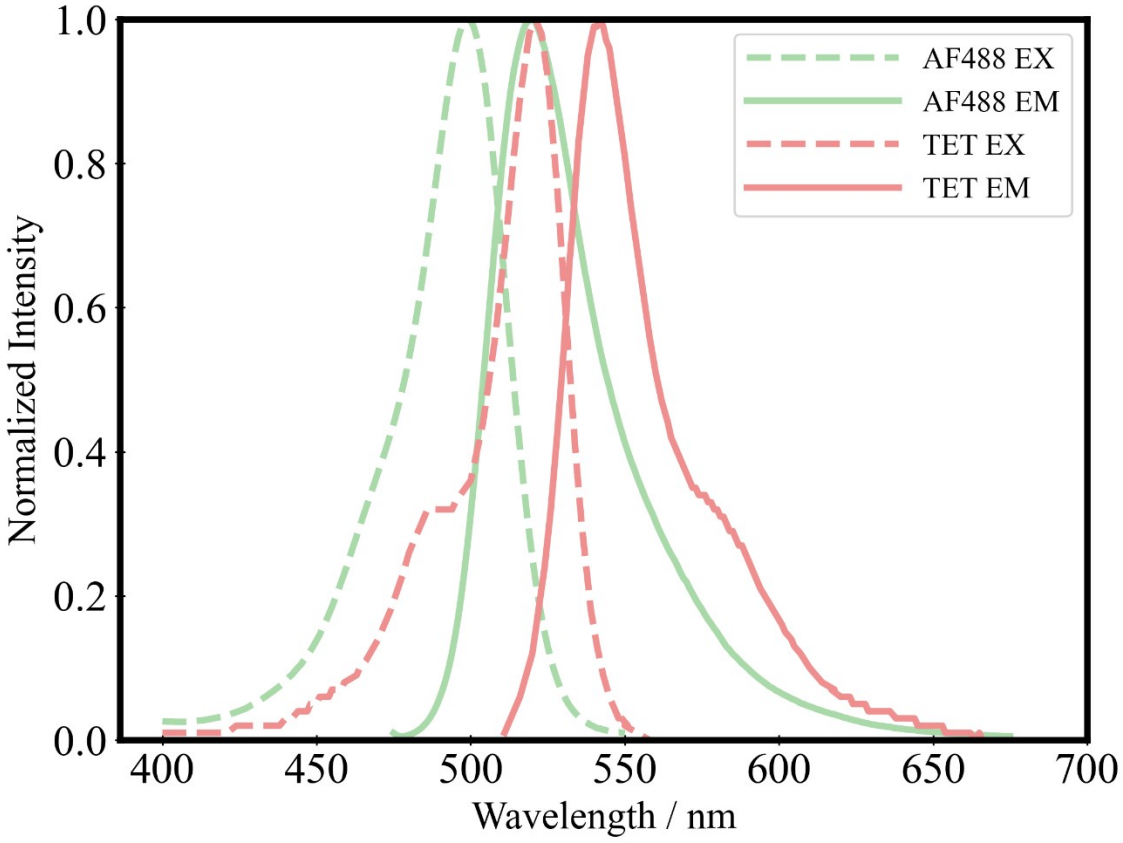

Figure S1. Excitation (EX) and emission (EM) spectrums of AF488 and TET.

Table S1. dPCR reaction system design

bla_{NDM}	**Gene (85)**	CACACCAGTGACAATATCACCGTTGGGATCGACGGCACCGAC ATCGCTTTTGGTGGCTGCCTGATCAAGGACAGCAAGGCCAAGT
	NDM-F	CACACCAGTGACAATATCACCGTTG
	NDM-R	ACTTGGCCTTGCTGTCCTTGAT
	Probe	TCGACGGCACCGACATCGCTT

bla_{VIM}	**Gene (258)**	CTTCGGTCCAGTAGAACTCTTCTATCCTGGTGCTGCGCATTCG ACCGACAACTTAGTTGTGTACGTCCCGTCTGCGAGTGTGCTCT ATGGTGGTTGTGCGATTTATGAGTTGTCACGCACGTCTGCGGG GAACGTGGCCGATGCCGATCTGGCTGAATGGCCCACCTCCATT GAGCGGATTCAACAACACTACCCGGAAGCACAGTTCGTCATTC CGGGGCACGGCCTGCCGGGCGGTCTAGACTTGCTCAAGCACA C
	VIM-F	CTTCGGTCCAGTAGAACTCT
	VIM-R	GTGTGCTTGAGCAAGTCT
	Probe	ATGCCGATCTGGCTGAATGGCCCAC

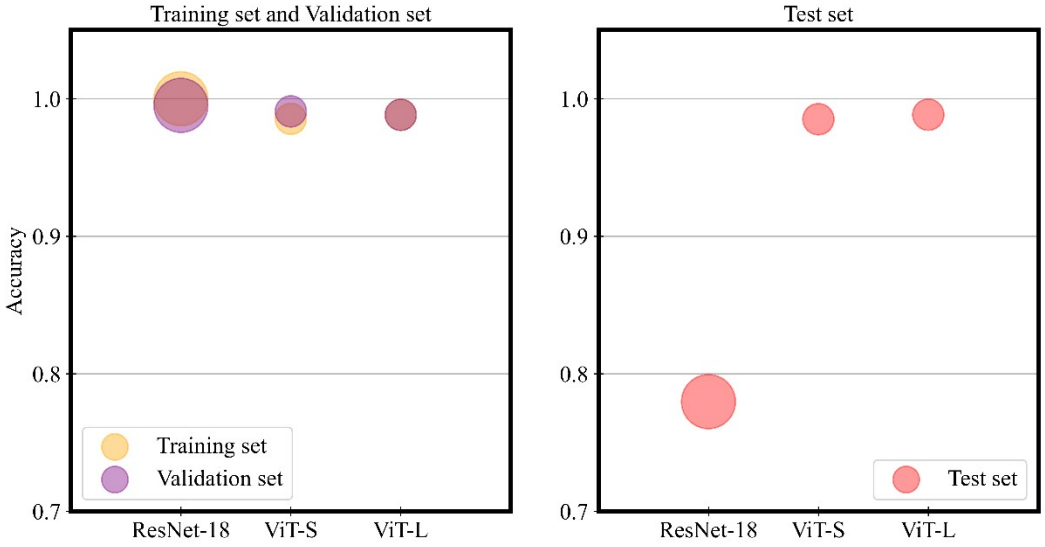

Figure S2. Performance comparison of ResNet-18 and ViT. Performances of ResNet-18, ViT model on small dataset (ViT-S) (7000 images in training set and 3000 images in test set) and ViT model on larger dataset (ViT-L) (70000 images in training set and 30000 images in test set) are compared. Radius of the scatters indicates MACs (1.49G for ResNet-18 and 0.86G for ViT).

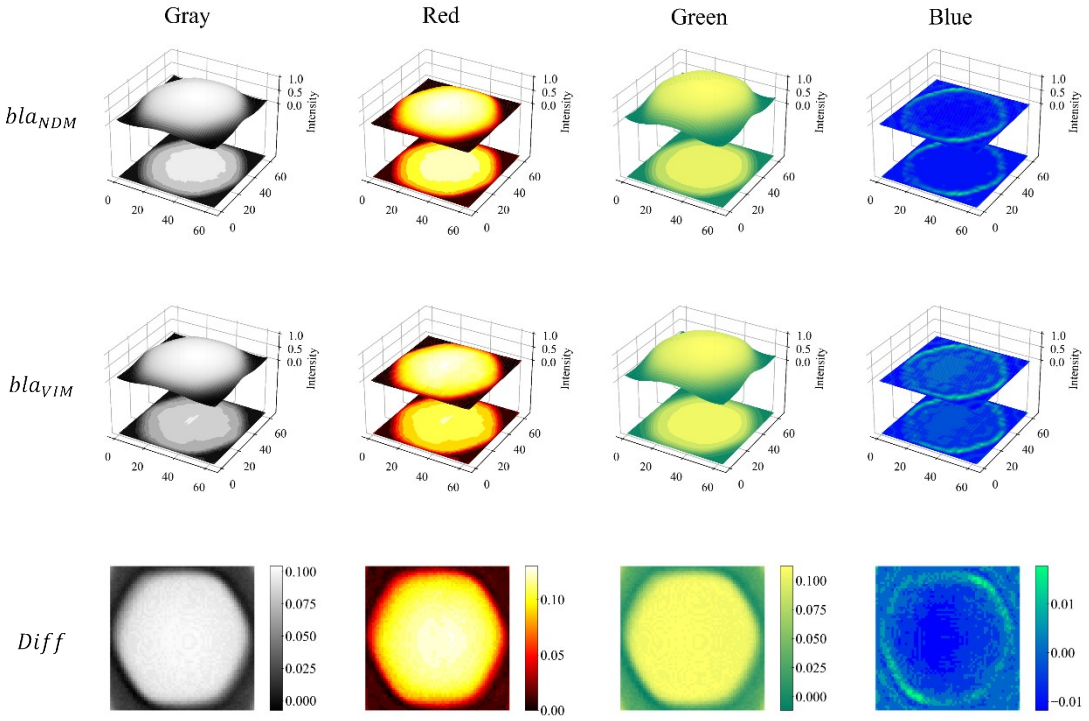

Figure S3. The intensities spatial distribution of gray and RGB values within bla_{NDM} and bla_{VIM} microwells (the first and the second rows) and their difference (the third row). Gray intensities in the figure were normalized by the maximum value in the gray intensities of bla_{NDM} and bla_{VIM} merged images. RGB values are normalized by the maximum value in all three channels for bla_{NDM} and bla_{VIM} merged images.

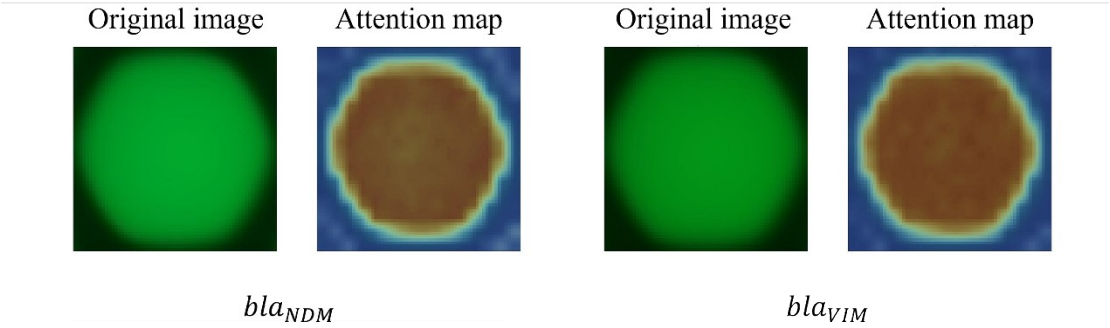

Figure S4. Attention map for the last layer of ViT.

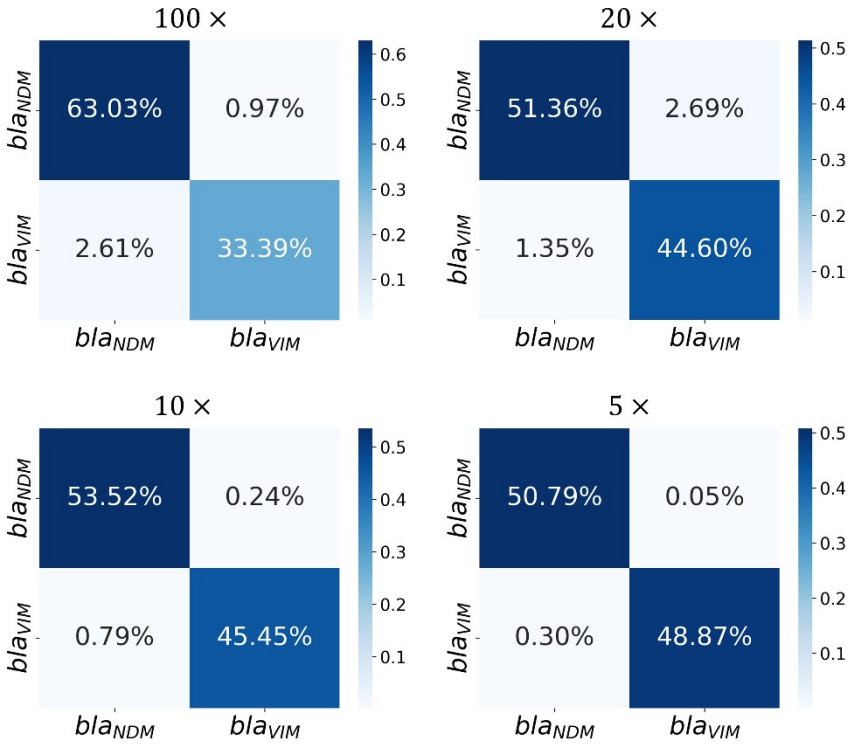

Figure S5. Confusion matrix for test set on different concentration.

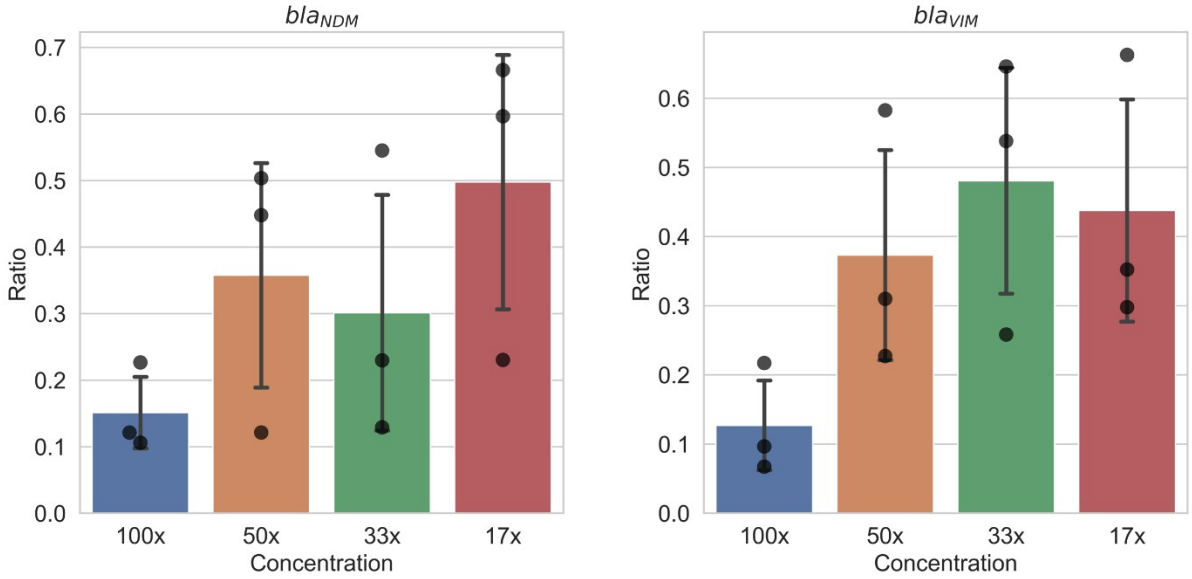

Figure S6. Quantification results for bla_{NDM} and bla_{VIM} dual target samples by intensity-based method (Gaussian multi-peak fitting on intensity distribution histogram). Both gene have unstable performance on quantification.