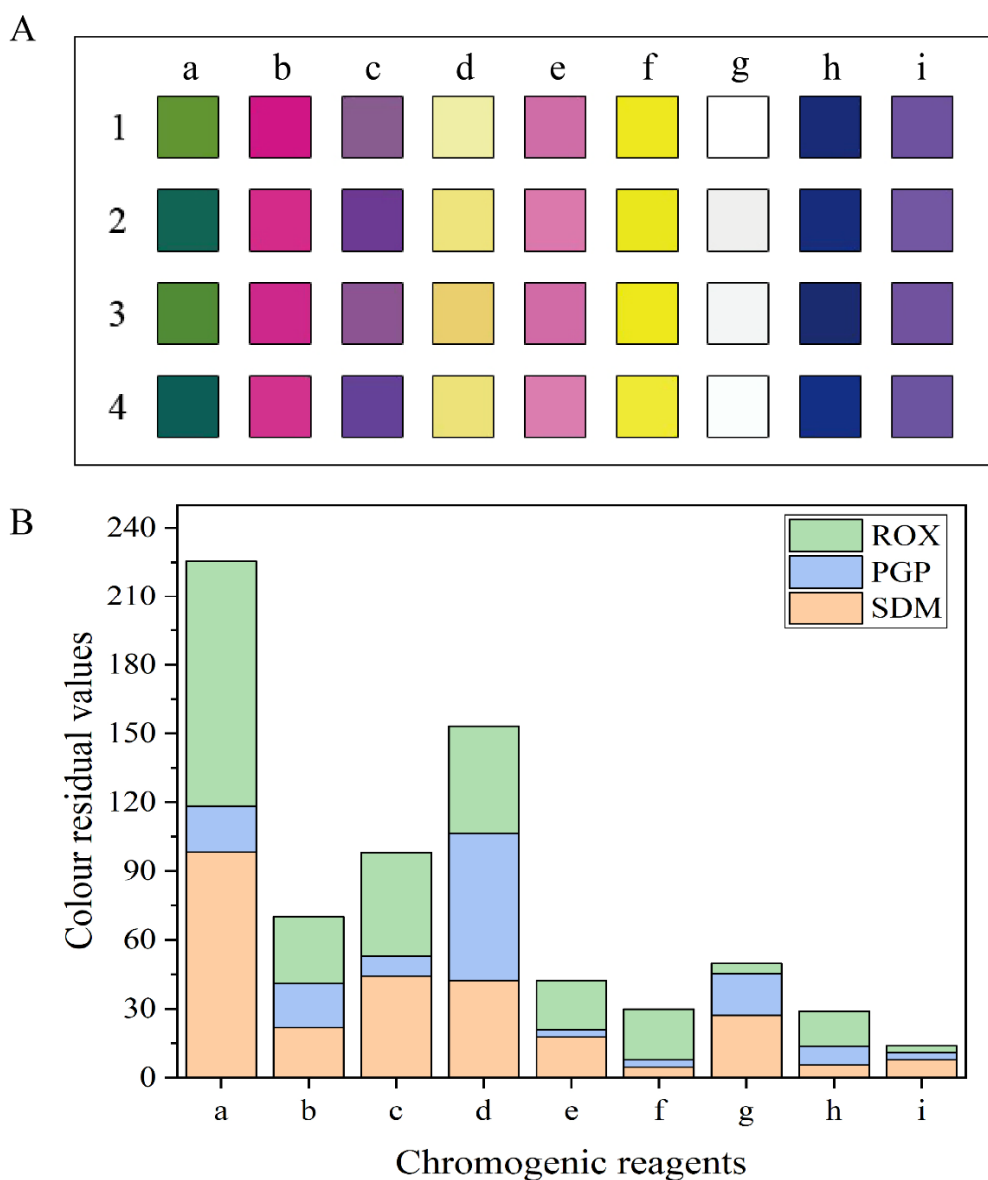
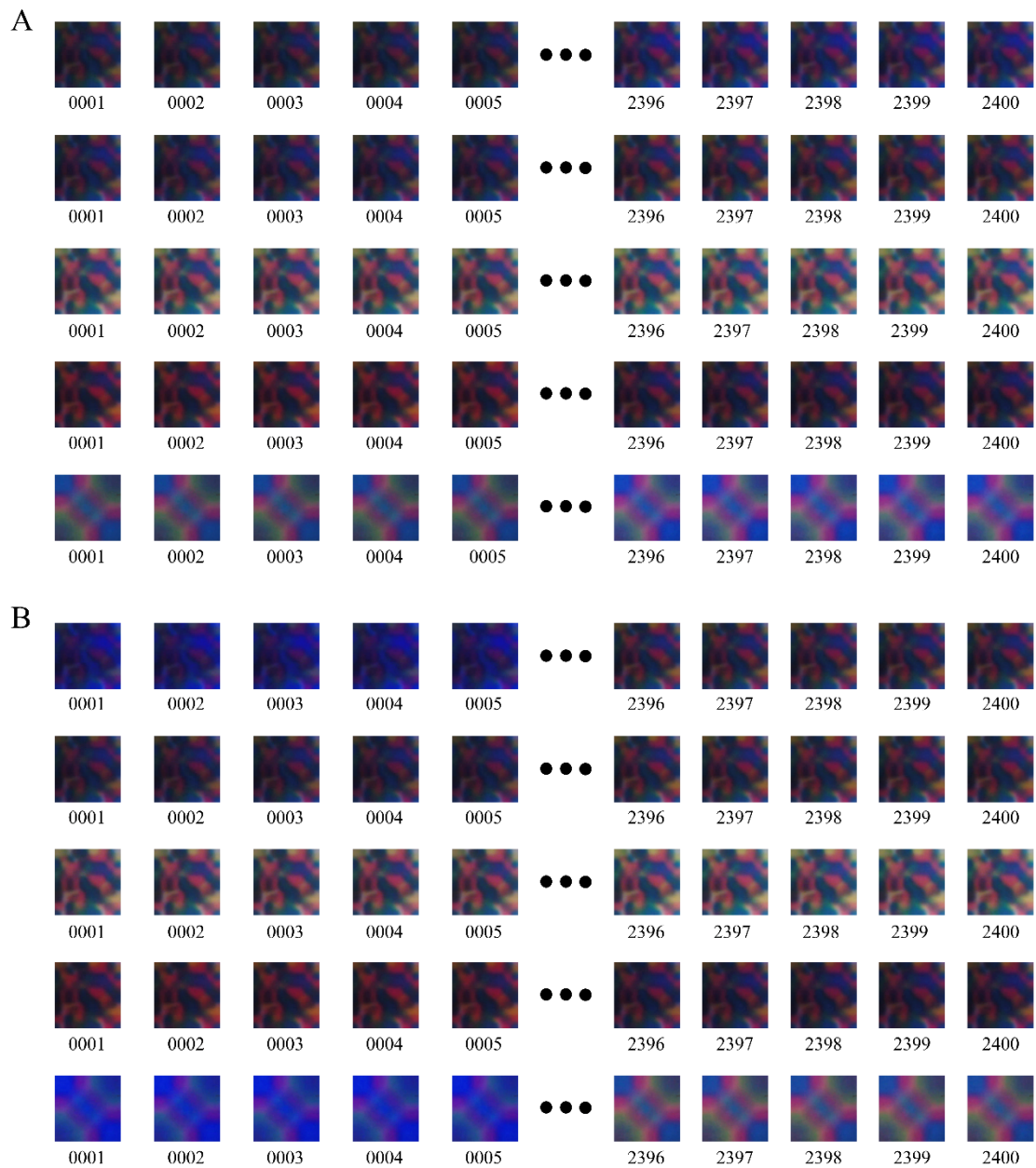


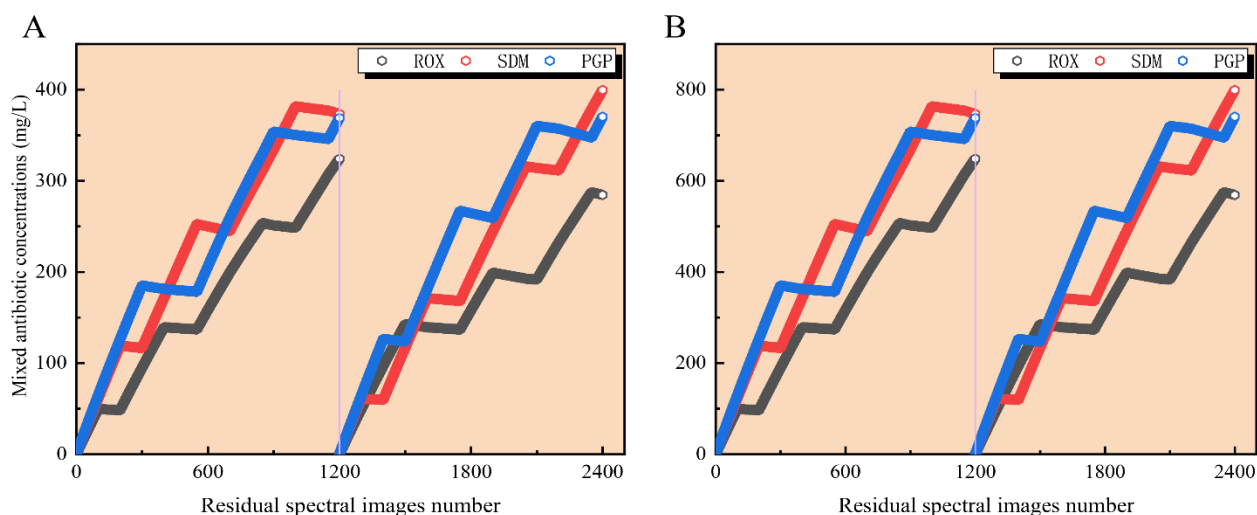
## Appendix



**Fig. S1** (A) Plot of cavity slab screening experiment. Letters a–i represent ten chromogenic reagents: bromocresol green (a), neutral red (b), bromocresol blue (c), methyl orange (d), methyl red (e), cresol red (f), ninhydrin (g), coumadin blue (h), and crystalline violet (i). Numbers 1–4 indicate the addition of ultrapure water and ROX, PGP, and SDM, respectively. (B) Distribution of color residual values after the chromogenic reaction



**Fig. S2** Characteristic spectral image sets. (A) Five sets of characteristic spectral images under chromogenic system I. (B) Five sets of characteristic spectral images under chromogenic system II



**Fig. S3** Concentration labels for the remaining spectral images. (A) and (B) are three-dimensional concentration labels for the residual spectral images of 5 g/L and 10 g/L antibiotic stock solution injection, respectively

**Table S1** Shooting parameters

Item	Parameter setting
Image resolution	300 × 300
Bit depth	24
Horizontal resolution	300 dpi
Vertical resolution	300 dpi
Color model	RGB

**Table S2** Peristaltic pump parameters

Model	Sample	Flow velocity
BT300-2J	ROX	1.55 mL/min
BT300-2J	SDM	1.90 mL/min
BT300-2J	PGP	2.02 mL/min

**Table S3** Detailed architecture of GoogLeNet Inception v1 CNN

<b>Laver</b>	<b>Layer(type)</b>	<b>Output Shape</b>
0	Input Layer	(None,224,224,3)
1	Convolution Layer	(None,112,112,64)
2	Relu function	(None,112,112,64)
3	Padding Layer	(None,113,113,64)
4	Max Pooling Layer	(None,56,56,64)
5	Local Response Normalization Layer	(None,56,56,64)
6	Convolution Layer	(None,56,56,64)
7	Relu function	(None,56,56,64)
8	Convolution Layer	(None,56,56,192)
9	Relu function	(None,56,56,192)
10	Local Response Normalization Layer	(None,56,56,192)
11	Max Padding Layer	(None,57,57,192)
12	Pooling Layer	(None,28,28,192)
13	Inception_Net Graph	(None,28,28,256)
14	Inception_Net Graph	(None,28,28,480)
15	Padding Layer	(None,29,29,480)
16	Max Pooling Layer	(None,14,14,480)
17	Inception_Net Graph	(None,14,14,512)
18	Inception_Net Graph	(None,14,14,512)
19	Inception_Net Graph	(None,14,14,512)
20	Inception_Net Graph	(None,14,14,528)
21	Inception_Net Graph	(None,14,14,832)
22	Padding Layer	(None,15,15,832)
23	Max Pooling Layer	(None,7,7,832)
24	Inception_Net Graph	(None,7,7,832)
25	Inception_Net Graph	(None,7,7,1024)
26	Max Pooling Layer	(None,1,1,1024)
27	Dropout Layer	(None,1,1,1024)

28	Flatten Layer	(None,1024)
29	Linear Layer	(None,1000)
30	Ramp	(None,1000)
31	Linear Layer	(None,5)
32	Output	(None, 5)

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