

Supplementary Material: Comprehensive Serum Glycopeptide Spectra Analysis Combined with Artificial Intelligence (CSGSA-AI) to Diagnose Early-Stage Ovarian Cancer

Kazuhiro Tanabe, Masae Ikeda, Masaru Hayashi, Koji Matsuo, Miwa Yasaka, Hiroko Machida, Masako Shida, Tomoko Katahira, Tadashi Imanishi, Takeshi Hirasawa, Kenji Sato, Hiroshi Yoshida and Mikio Mikami

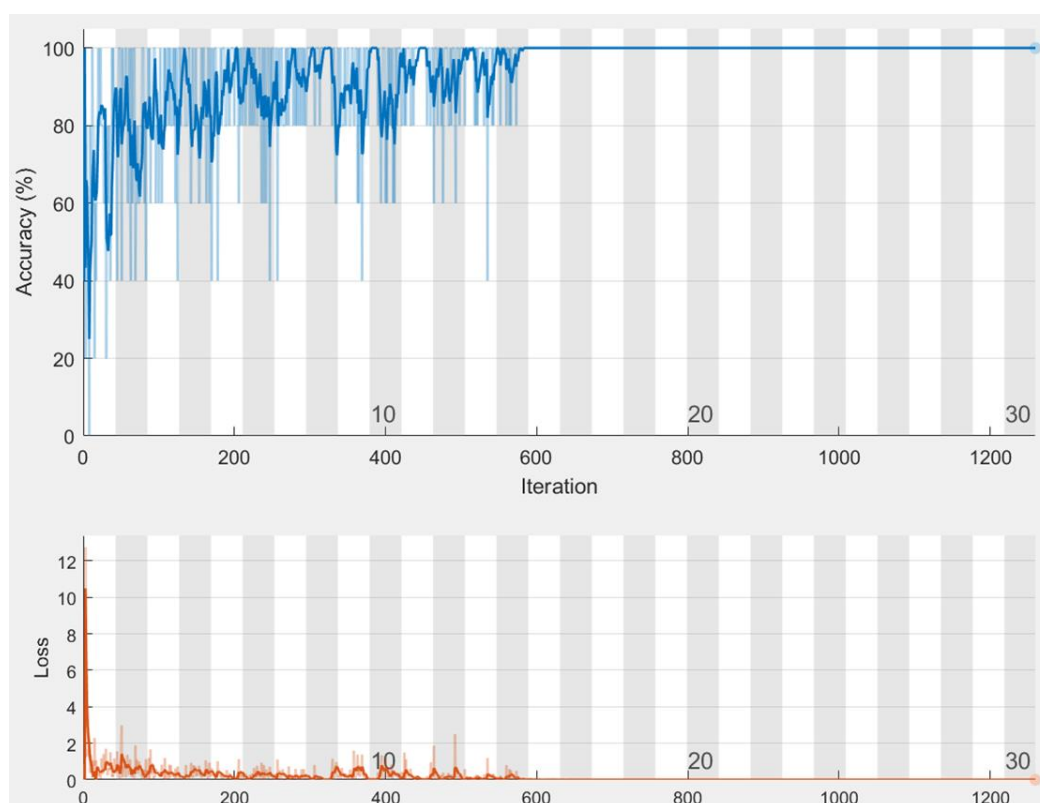


Figure 1. Accuracy and loss converging curve.

Table 1. The method of creating 2D barcodes from the levels of glycopeptide expression.

Glycopeptide Relative Intensity	Brightness
< 100	RGB (255, 255, 255)
100–300	RGB (240, 240, 240)
300–500	RGB (220, 220, 220)
500–700	RGB (200, 200, 200)
700–900	RGB (180, 180, 180)
900–1100	RGB (160, 160, 160)
1100–1300	RGB (140, 140, 140)
1300–1500	RGB (120, 120, 120)

1500–1700	RGB (100, 100, 100)
1700–1900	RGB (80, 80, 80)
1900–2100	RGB (60, 60, 60)
2100–2300	RGB (40, 40, 40)
2300–2600	RGB (20, 20, 20)
2600–3000	RGB (10, 10, 10)
> 3000	RGB (0, 0, 0)

Table 2. The method of creating 2D barcodes from the levels of glycopeptide expression and serum levels of CA125 and HE4.

Glycopeptide Relative Intensity	R	G	B
< 100	$255 \times \text{CA125_factor}$	$255 \times \text{HE4_factor}$	255
100–300	$240 \times \text{CA125_factor}$	$240 \times \text{HE4_factor}$	240
300–500	$220 \times \text{CA125_factor}$	$220 \times \text{HE4_factor}$	220
500–700	$200 \times \text{CA125_factor}$	$200 \times \text{HE4_factor}$	200
700–900	$180 \times \text{CA125_factor}$	$180 \times \text{HE4_factor}$	180
900–1100	$160 \times \text{CA125_factor}$	$160 \times \text{HE4_factor}$	160
1100–1300	$140 \times \text{CA125_factor}$	$140 \times \text{HE4_factor}$	140
1300–1500	$120 \times \text{CA125_factor}$	$120 \times \text{HE4_factor}$	120
1500–1700	$100 \times \text{CA125_factor}$	$100 \times \text{HE4_factor}$	100
1700–1900	$80 \times \text{CA125_factor}$	$80 \times \text{HE4_factor}$	80
1900–2100	$60 \times \text{CA125_factor}$	$60 \times \text{HE4_factor}$	60
2100–2300	$40 \times \text{CA125_factor}$	$40 \times \text{HE4_factor}$	40
2300–2600	$20 \times \text{CA125_factor}$	$20 \times \text{HE4_factor}$	20
2600–3000	$10 \times \text{CA125_factor}$	$10 \times \text{HE4_factor}$	10
> 3000	0	0	0

$$\text{CA125_factor} = (3 - \text{Log}_{10}(\text{CA125}))/3.$$

$$\text{HE4_factor} = (3 - \text{Log}_{10}(\text{HE4}))/3.$$

Table 3. Exclusion criteria of participants.

Exclusion Criteria
Affected by combination of several types of cancers
A history of hormonal drug administration due to malignant tumor, autoimmune disease and thyroid abnormality
Abnormal values in blood tests. WBC: > 9600, PLT: > 48, LDH: > 263, HB: < 9.2 and CRP > 3.0.
Renal dysfunction
Liver dysfunction
Aged 75 and above
Diagnosed as mixed carcinoma
Diagnosed as fallopian tube cancer/ peritoneal cancer
Affected massive ascites / pleural effusion
Diagnosed as endometrioma, mucinous cystadenoma, germ cell tumor or sex cord stromal tumor