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ABL90 FLEX PLUS creatinine and urea/BUN performance vs four established laboratory methods

The unique design of the ABL90 FLEX PLUS sensor cassette makes it possible to integrate creatinine and urea/BUN into a blood gas analyzer, alongside the standard panel of chemistry/BMP tests and blood gas analysis.

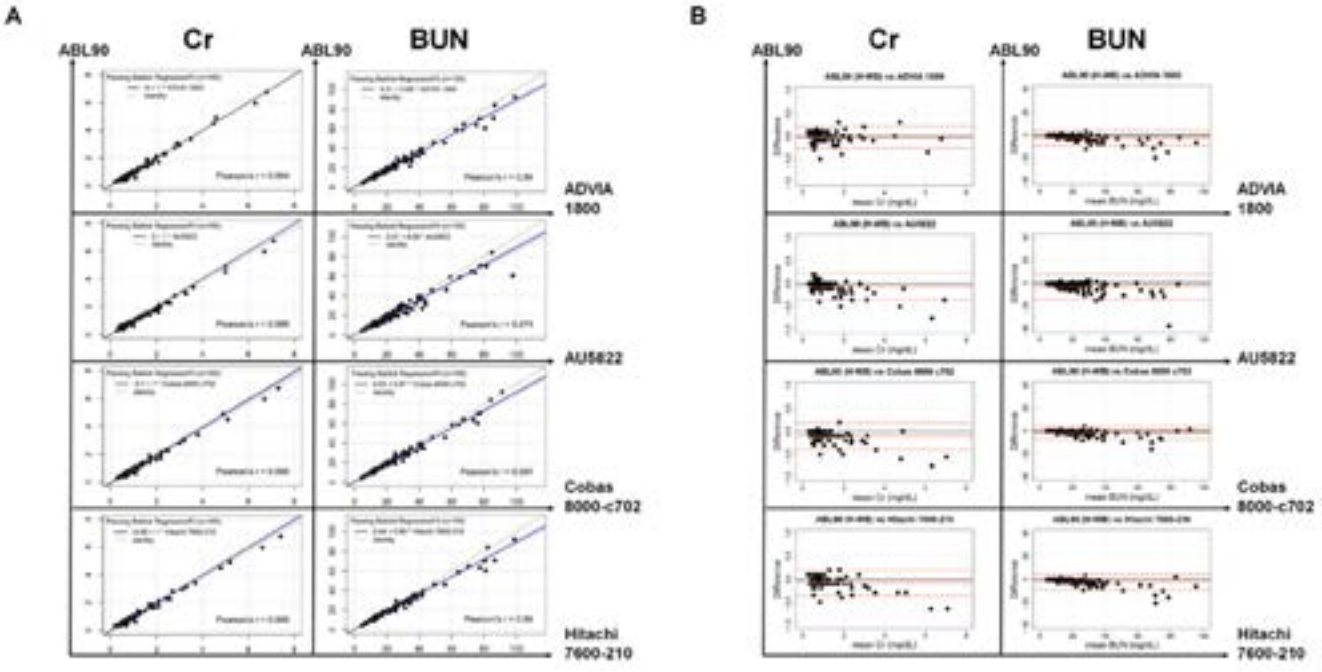
The assays' analytical performance versus the Siemens ADVIA 1800, Beckman Coulter AU5822, Roche COBAS 8000-c702, and Hitachi 7600-210 are outlined below.

Creatinine and Urea/BUN on the ABL90 FLEX PLUS

A study from Chonnam National University Hwasun Hospital in South Korea shows that creatinine measurements on the ABL90 FLEX PLUS blood gas analyzer have excellent agreement in whole blood with results from four established central lab platforms [1].

Figure 1A: Passing-Bablok regression analysis

Figure 1B: **Bland-Altman plots**



ABL90 FLEX PLUS creatinine and urea/BUN vs. four central lab analyzers (whole blood vs. serum).

Figure 1: Data obtained from: *Lim, H.-J. et al*. Evaluation of the Accuracy of Cr and BUN Using the ABL90 FLEX PLUS Blood Gas Analyzer and the Equivalence of Candidate Specimens for Assessment of Renal Function. J. Clin. Med. 2023.

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Figure 1's tabulated performance data

Creatinine

Comparator analyzer	n	Slope	Intercept	Pearson's r	Mean difference to ABL90 FLEX (mg/dL)
ADVIA 1800	105	1.00	0.0	0.994	-0.01
AU 5822	105	1.00	0.0	0.995	-0.06
Cobas 8000 c702	105	1.00	0.1	0.995	-0.10
Hitachi 7600-210	105	1.00	0.05	0.995	-0.08

Table 1: Creatinine performance characteristics

Urea/BUN

Comparator analyzer	n	Slope	Intercept	Pearson's r	Mean difference to ABL90 FLEX (mg/dL)
ADVIA 1800	105	0.89	0.31	0.990	-2.70
AU 5822	105	0.89	0.31	0.974	-3.51
Cobas 8000 c702	105	0.91	0.53	0.991	-1.73
Hitachi 7600-210	105	0.89	0.44	0.990	-2.49

Table 2: Urea/BUN performance characteristics

ABL90 FLEX PLUS analyzer analytical summary

Parameter	Method	Measuring Range	Total analytical error (90 % Confidence level) [2]	Allowable Total Error (TEA) according to EFLM [3]
Creatinine	Enzymatic amperometry	35–900 µmol/L 0.4-10 mg/dL	@ 100 µmol/L: 9.5 %	Minimum: 11.7%
Urea	Enzymatic potentiometry	2-42 mmol/L 12-252 mg/dL	@ 7 mmol/L: 6.9 %	Minimum: 25.3%

REFERENCES

1. Lim, H.-J.; Lee, S.-Y.; Choi, H.-J. Evaluation of the Accuracy of Cr and BUN Using the ABL90 FLEX PLUS Blood Gas Analyzer and the Equivalence of Candidate Specimens for Assessment of Renal Function. J. Clin. Med. 2023, 12, 1940.
2. Wennecke G. ABL90 FLEX PLUS analyzer. Creatinine and Urea/BUN – meeting the expectations for laboratory and POC testing. Radiometer publication 2025. MAPSSS-001224 R1.
3. Aarsand AK, Fernandez-Calle P, Webster C, Coskun A, Gonzales-Lao E, Diaz-Garzon J, *et al*. The EFLM Biological Variation Database. https://biologicalvariation.eu/ Accessed March 2025.

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