Urine Protein Quantification in Human Urine on Boron-Doped Diamond Electrodes based on Electrochemical Reaction of Coomassie Brilliant Blue

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Supplementary Information

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Table S1. The concentrations of protein contained in urine samples calculated by colorimetric protein analysis using the Bradford method

Fig. S1. Dependence of absorbance of CBB at 595 nm on concentration of bovine serum albumin (BSA) at room temperature. The dotted line shows a best fit to the data using least-squares linear regression.

Fig. S2. LSVs for the oxidative reaction of CBB on a BDD electrode in 1X PBS (black line) containing 125 µg/mL BSA (red line), 125 µg/mL BSA + urine (blue line), 125 µg/mL BSA + urine + uricase (green line), scanned from 0 to +1.0 V at a scan rate of 0.1 V s^{-1} at room temperature. The urine sample used here is Urine sample A.

Fig. S3. LSVs for the oxidative reaction of CBB on a BDD electrode in 1X PBS containing urine + uricase + 31.25 (black line), 62.5 (green line), or 125 µg/mL BSA (red line), scanned from 0 to +1.0 V at a scan rate of 0.1 V s^{-1} at room temperature. The urine sample used here is Urine sample A.

Fig. S4. Plots of values of the reduction currents at –0.385 V (A), the ratio of the current at –0.385 V ($i_{-0.385\ V}$) over the current at –0.2 V ($i_{-0.2\ V}$) (B), and plots of values of the ratio of the current at –0.385 V ($i_{-0.385\ V}$) minus that at –0.1 V ($i_{-0.1\ V}$) over the current at –0.2 V ($i_{-0.2\ V}$) minus that at –0.1 V ($i_{-0.1\ V}$) (C) in LSVs of CBB dependent on protein concentrations in Urine sample A at room temperature. The protein concentration was adjusted by adding a certain amount of BSA to the solution as described in Figure 2. The dotted lines show a best fit to the data using least-squares linear regression.

Fig. S5. Plots of values of the ratio of the current at –0.3 V ($i_{-0.3\ V}$) minus that at –0.1 V ($i_{-0.1\ V}$) in DPVs of the concentrated CBB dependent on protein concentrations in Urine sample A at room temperature. Other conditions are the same as listed in the caption to Fig. 4.

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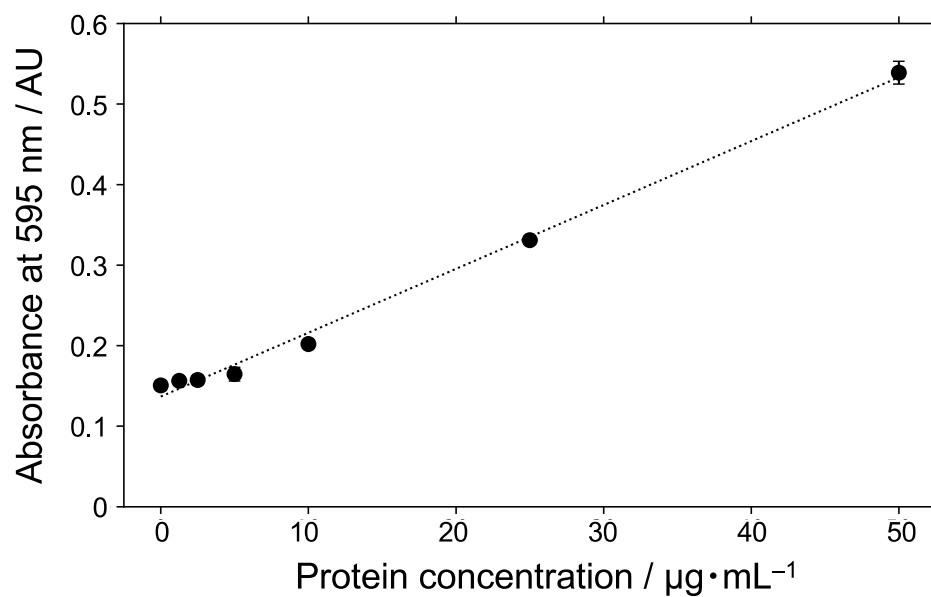| Urine sample	protein [μg/mL]
A	25.2 ± 1.8
B	34.8 ± 0.9
C	37.1 ± 0.7
D	17.7 ± 1.0

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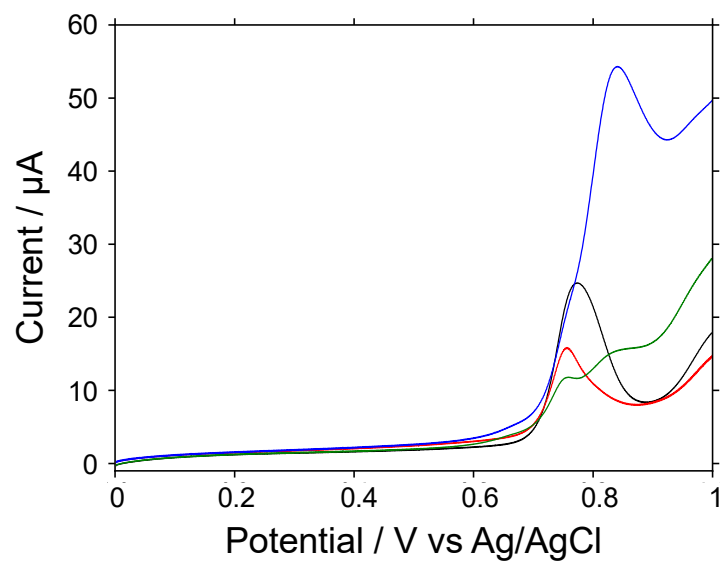
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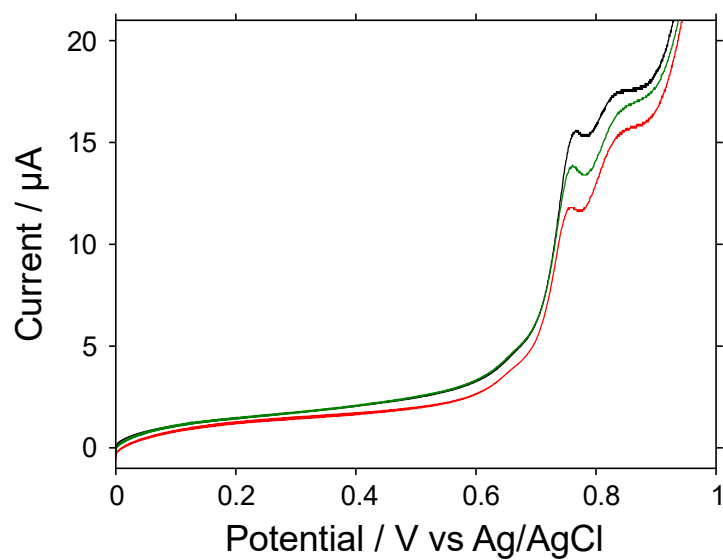
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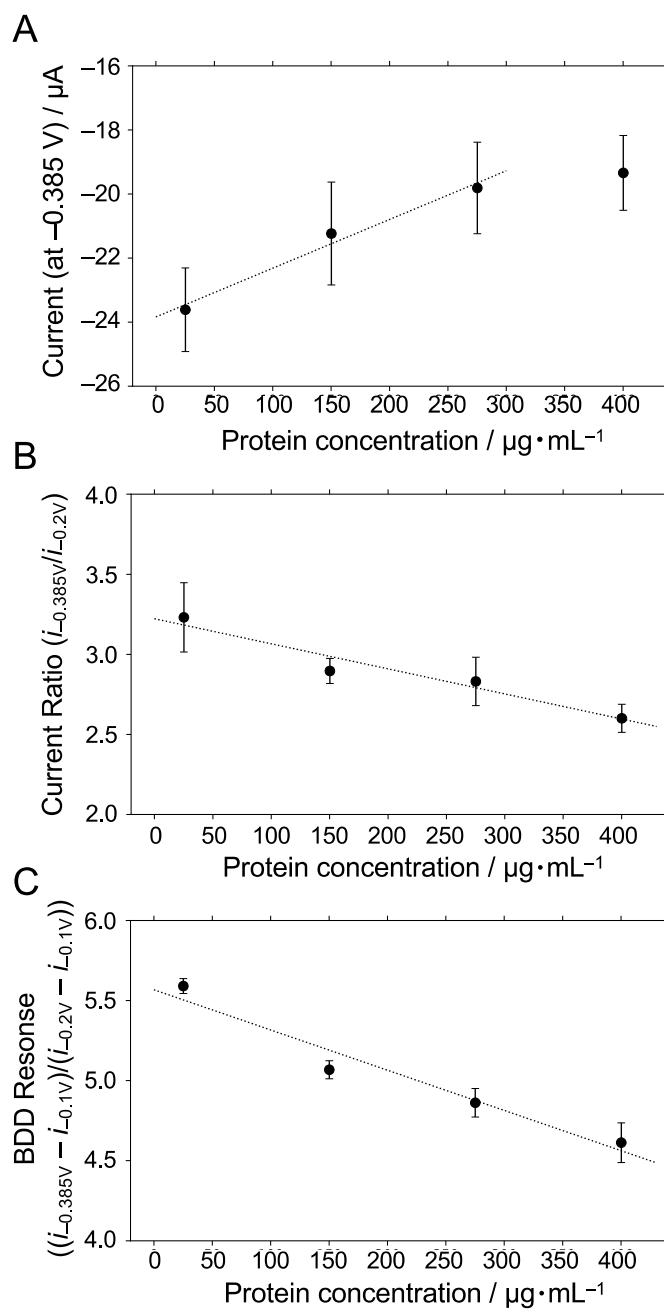
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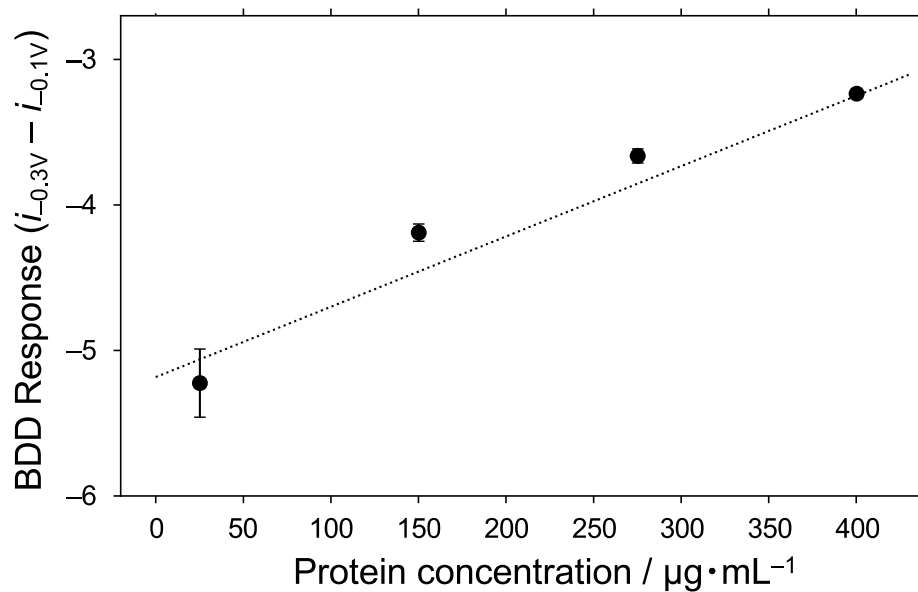
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