



The investigation of urinary neutrophil gelatinase-associated lipocalin concentration stability

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INTRODUCTION AND AIMS

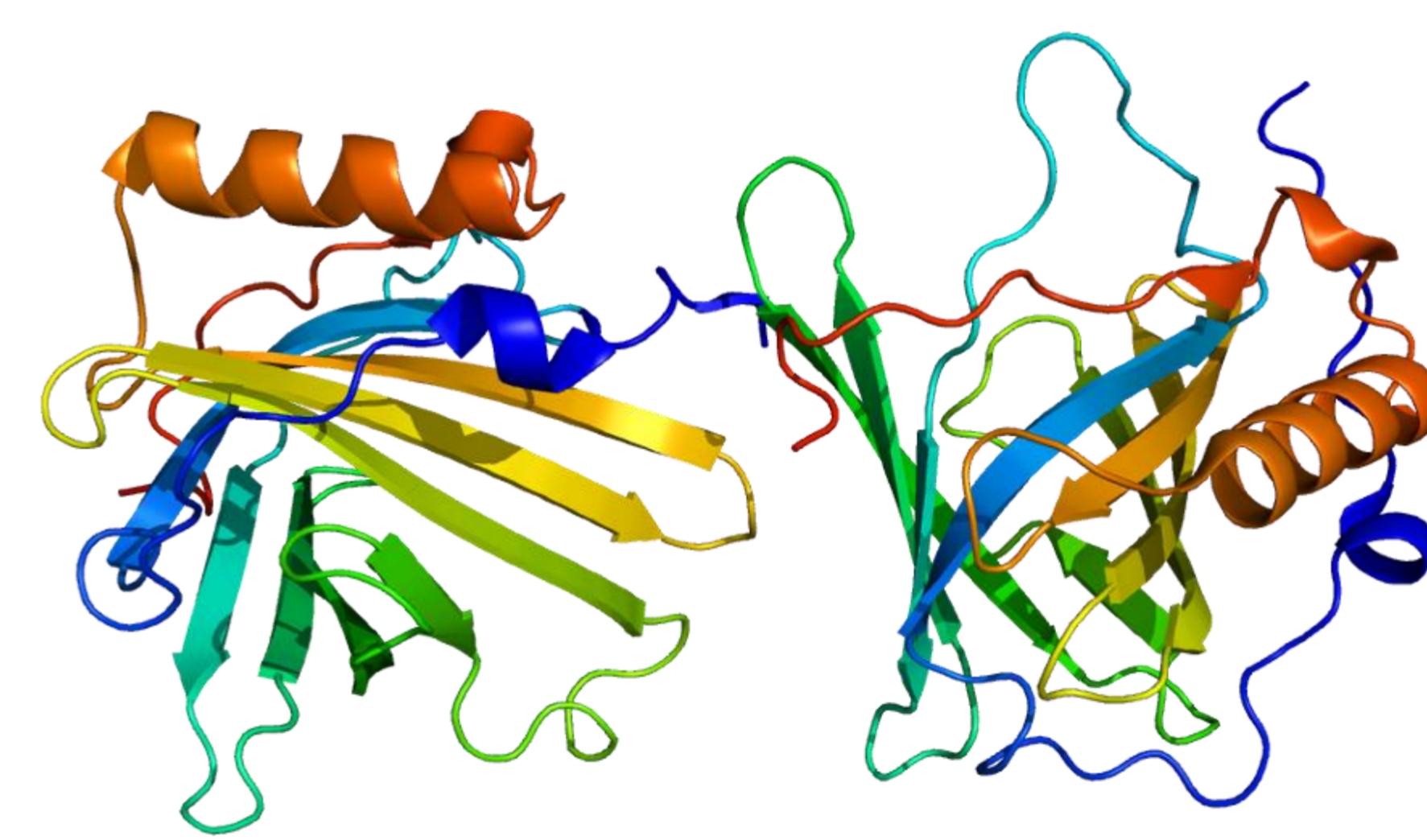
Urinary neutrophil gelatinase-associated lipocalin (uNGAL) is a reliable biomarker for early diagnosis of acute kidney injury. In chronic kidney disease uNGAL level is associated with tubular dystrophy. The aim of our study was to investigate short-term and long-term stability of uNGAL concentration for transportation of samples to a specialized laboratories.

METHODS

Levels of uNGAL were measured by CMIA on ARCHITECT i system (Abbott Laboratories, USA) in one-time urine sample of 20 patients with kidney damage. Samples were transported to the laboratory on ice within 15 minutes after collection. Every sample was aliquoted into 7 tubes. One portion was measured immediately, six another - stored at the temperature -22 °C, +4 °C and +22 °C during 4 hours, 24 hours, 48 hours and 7 days (table 1).

Table 1. Preanalytical phase

Protocol	N	Transportation (min; °C)	Store conditions (h/d; °C)	Centrifugation (min; °C; g)
1 (control)	20	15; +4	<i>Cito!</i>	10; +4; 1000
2	20		4 h; +22	
3	20		24 h; +22	
4	20		24 h; +4	
5	20		48 h; +4	
6	20		7 d; +4	
7	20		7 d; -22	



Results were compared in duplicates for 20 patients per each temperature and time of storage and estimated in pairs using Dahlberg formula. The average, within- and between series imprecisions were calculated. Statistical significance was estimated with the Student paired t-test.

RESULTS

Within series CV% was in about 1.6-6.1% depending on concentration of uNGAL without significant differences of storage conditions ($p > 0.2$). The concentrations of uNGAL in samples stored for four hours at +22 °C, for two days at +4 °C, and one week at -22 °C did not differ compared with results of uNGAL measured immediately ($p > 0.11$) (table 2). The levels of uNGAL in samples stored for two days at +22 °C and for seven days at +4 °C were different from initial concentration ($p < 0.035$) (table 2).

Table 2. Evaluation of stability of uNGAL at different storage conditions (Dahlberg formula)

Protocol	2	3	4	5	6	7
Store conditions	4 h; +22 °C	24 h; +22 °C	24 h; +4 °C	48 h; +4 °C	7 d; +4 °C	7 d; -22 °C
Concentration variation, %	5,0	36,2	4,0	5,2	17,2	3,9
<i>p</i> (Dahlberg formula)	0,15	0,035	0,35	0,25	0,029	0,11



CONCLUSION

Concentrations of uNGAL are stable for four hours at +22° C, for two days at +4 °C, and at least one week at -22 °C, that allows long distance transport of biological samples to specialized laboratories whereby the study may become available to a wide range of clinical departments.

