



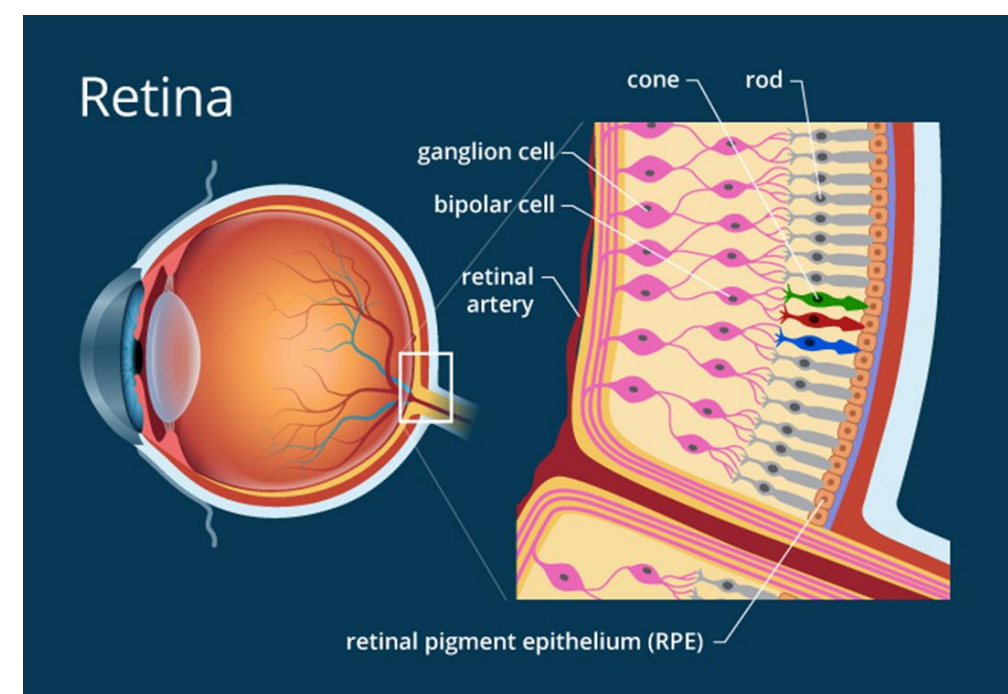
# Elevated Plasma Creatinine Levels in Old Female Retinal Dystrophic Pigmented Royal College of Surgeon (RCS) Rats



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## Background

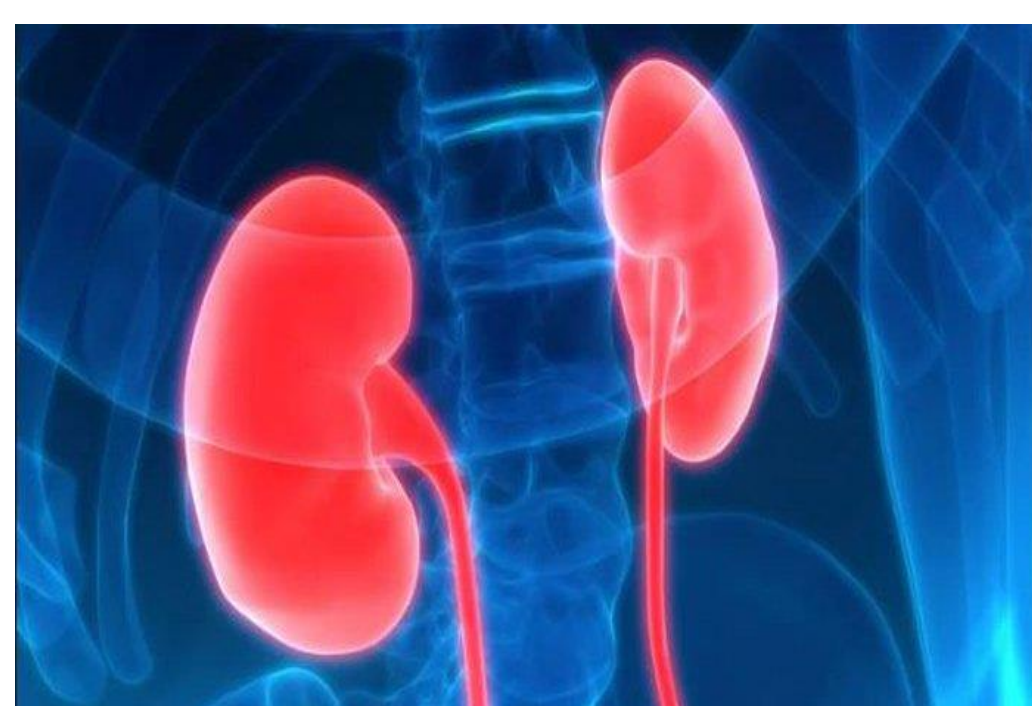
The RCS pigmented rat is known as an animal model for studying inherited and age-related retinal degeneration in humans. The photoreceptors (rods and cones) of the retina in the eye are responsible for vision because they contain a pigment that breaks down in the presence of light. The broken down photopigment must then be removed primarily by the retinal pigment epithelial cells (RPE). In retinal degenerative diseases, the broken down photopigment is not removed and builds up, causing retinal degeneration.



Retina of the Eye

There is an association between eye and kidney dysfunction in diseases such as diabetes mellitus and chronic kidney disease. There is much evidence on eye dysfunction in the pigmented RCS rat but limited information on kidney function in this model. Minchev (2000) reported a significant increase in protein excretion in female RCS rats at 22 months of age than their control rats. Increased protein excretion indicates there is also kidney dysfunction in this model.

Another sign of kidney dysfunction is a decrease in glomerular filtration rate (GFR). GFR indicates how well the kidney is filtering blood. A decrease in GFR is usually accompanied by an increase in plasma creatinine concentration. Plasma creatinine is a waste product from the breakdown of creatine in muscles and should be filtered out as waste by the kidneys.



The present study investigated whether there was an increase in plasma creatinine in aging pigmented female RCS rats.

## Research Question

Is plasma creatinine elevated in old female Royal College of Surgeons (RCS) rats?

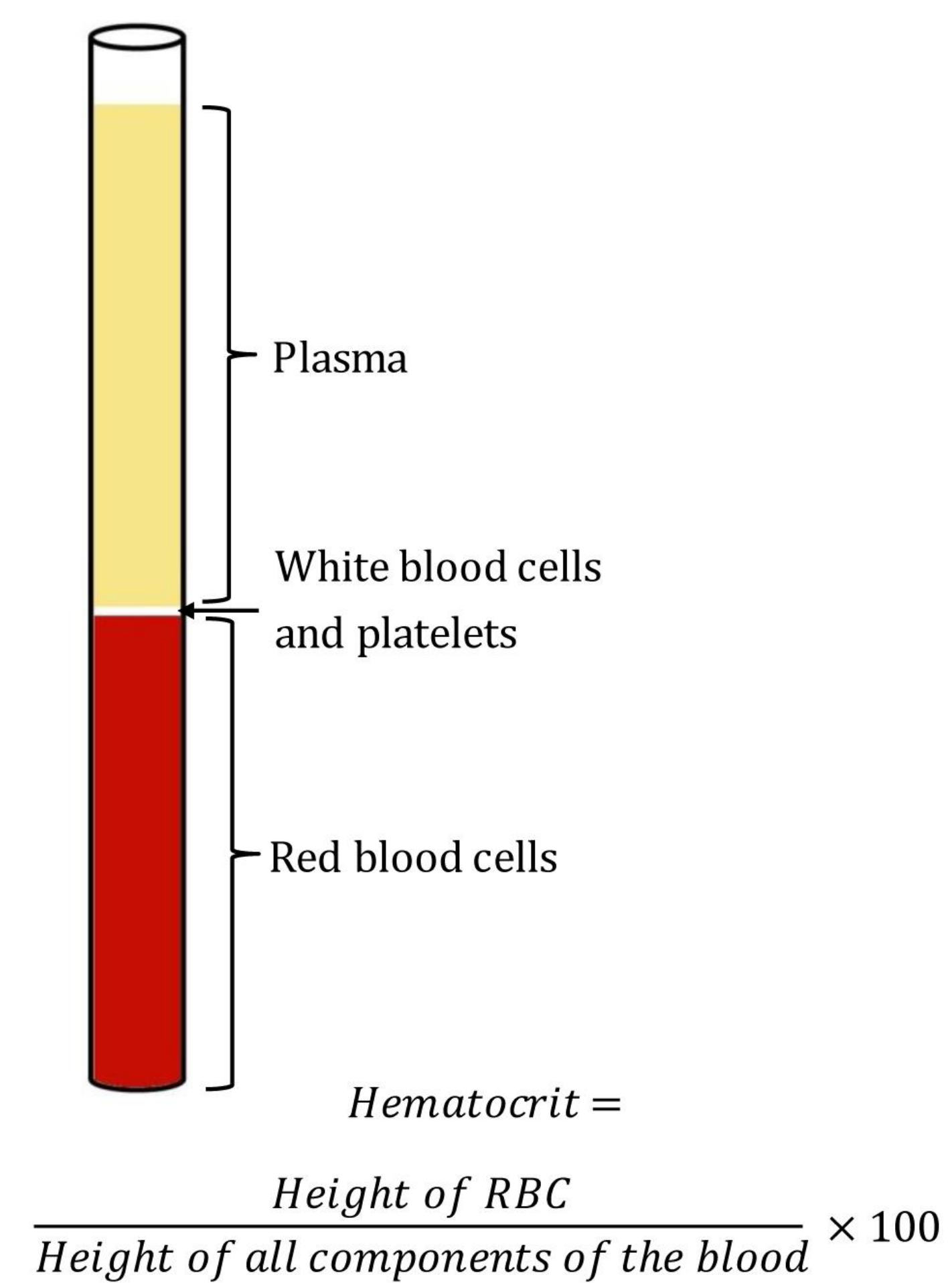
## Methods

1. Old female RCS rats, approximately 22 months of age were the experimental group in the study (n = 4). The control rats were similarly aged non-dystrophic RCS female rats (n = 4).

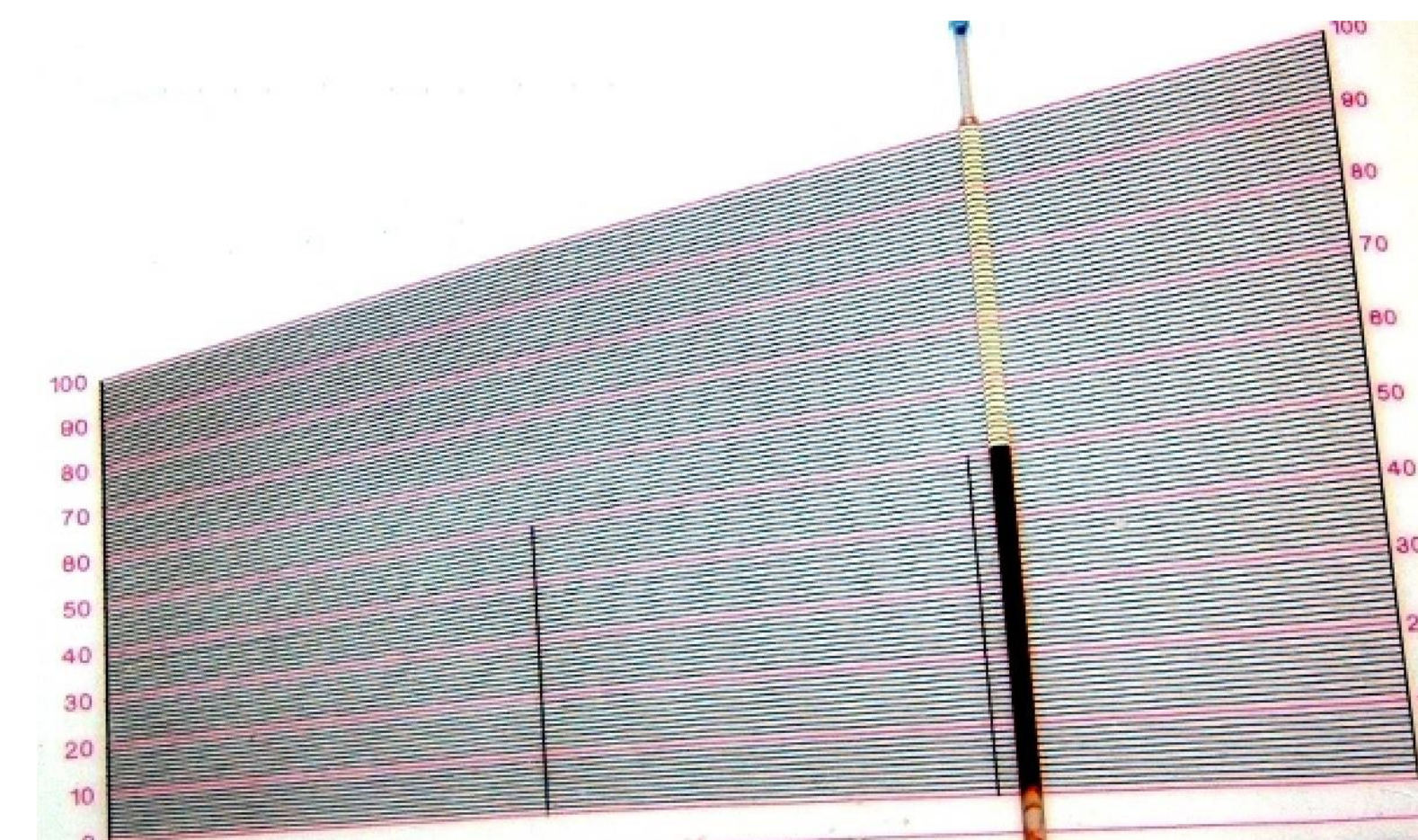


RCS Rat

- The rats were weighed (g), and their tails marked to distinguish them from the others.
- The rats were placed in small restrainers, and blood was collected from the tail into capillary tubes.
- The capillary tubes were spun down using Hematocrit Centrifuge for 3 minutes.
- The hematocrit for each rat was read using a Hematocrit Reader.



Spun Down Blood Sample



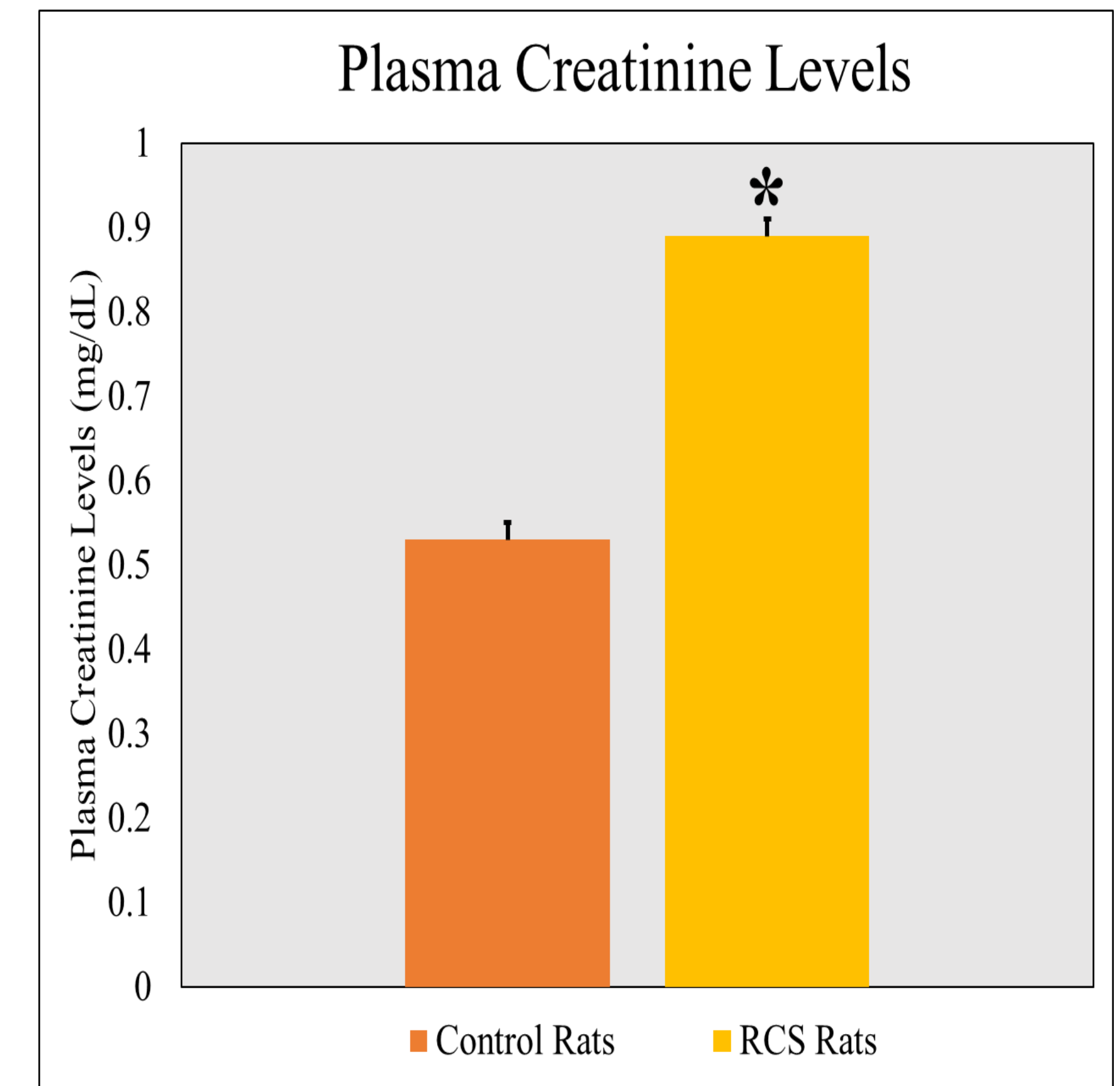
Hematocrit Reader



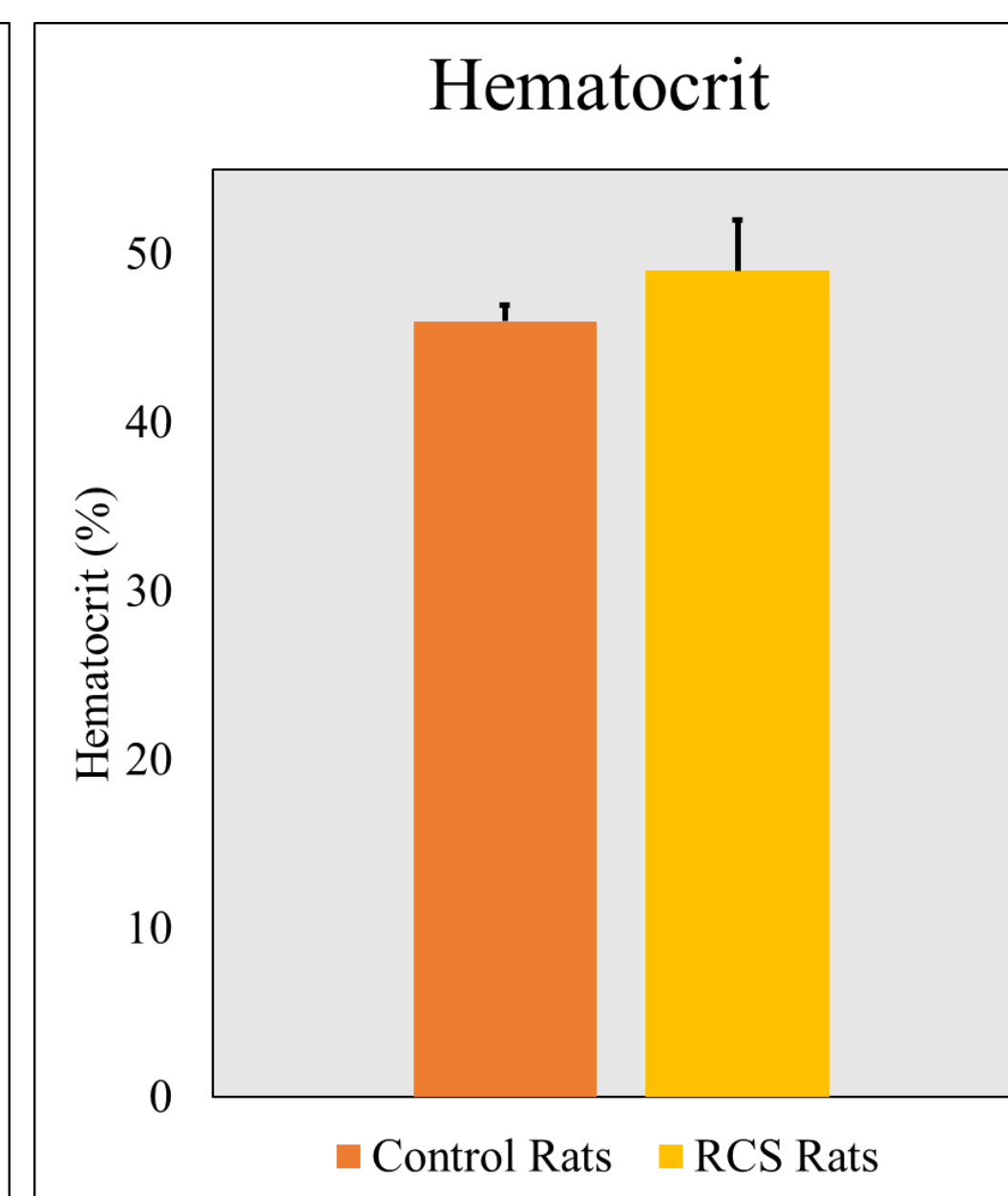
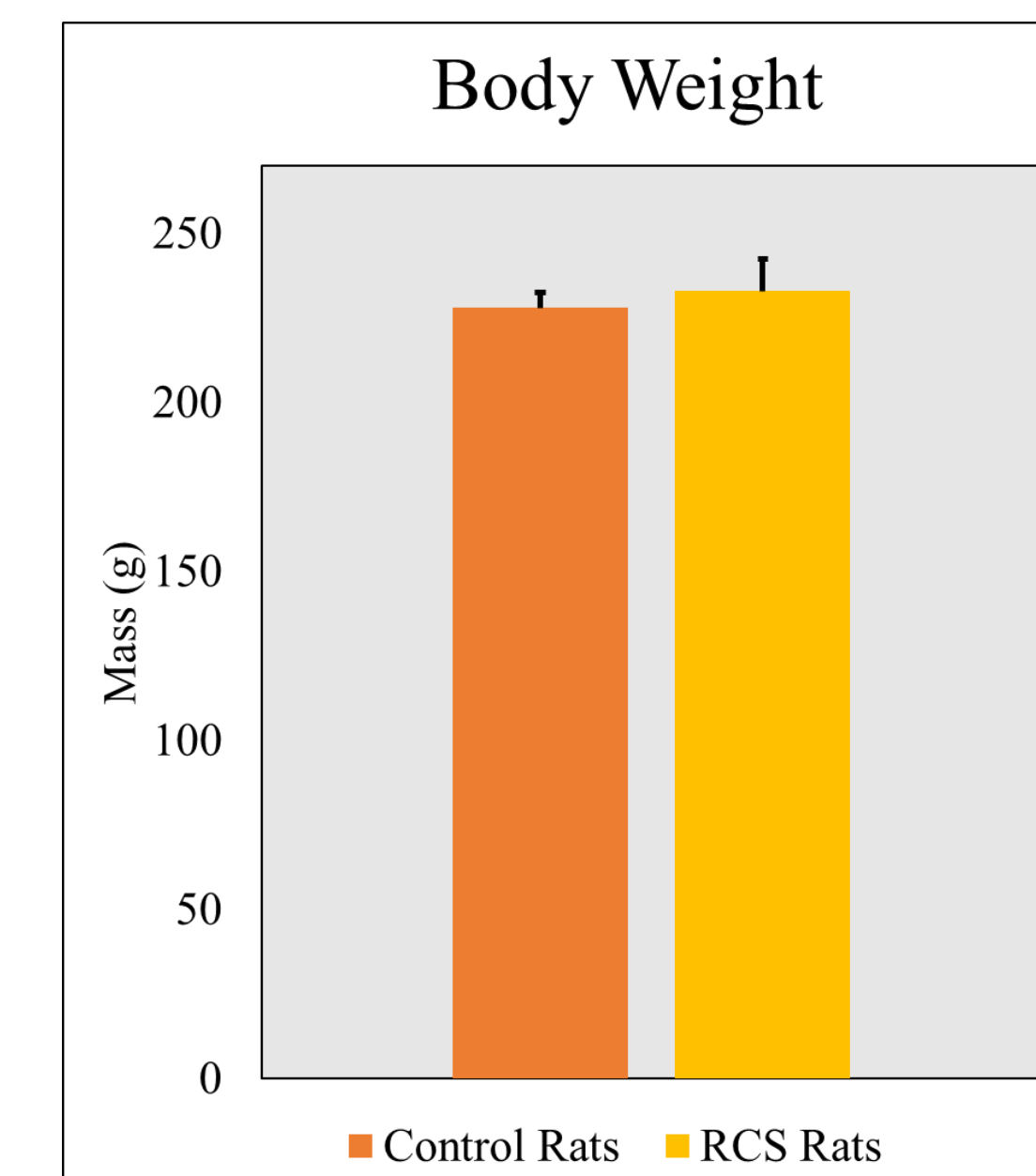
Reflotron

- The plasma samples for each rat were collected and placed on a Reflotron test strip for the determination of plasma creatinine levels (mg/dL).
- All data are expressed as mean  $\pm$  standard error of mean ( $X \pm \text{SEM}$ ). Differences were evaluated using a Student's t test. Statistical significance was accepted at  $p < 0.05$ .

## Results



\*Significantly different from Control



## Conclusion

- There was a significant increase in plasma creatinine levels in female RCS rats compared to the control group with no significant difference in body weight and hematocrit.
- The increase in plasma creatinine indicates that there is a decrease in glomerular filtration rate (GFR) in the RCS rats. This suggests kidney dysfunction as well.

## Acknowledgements

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