

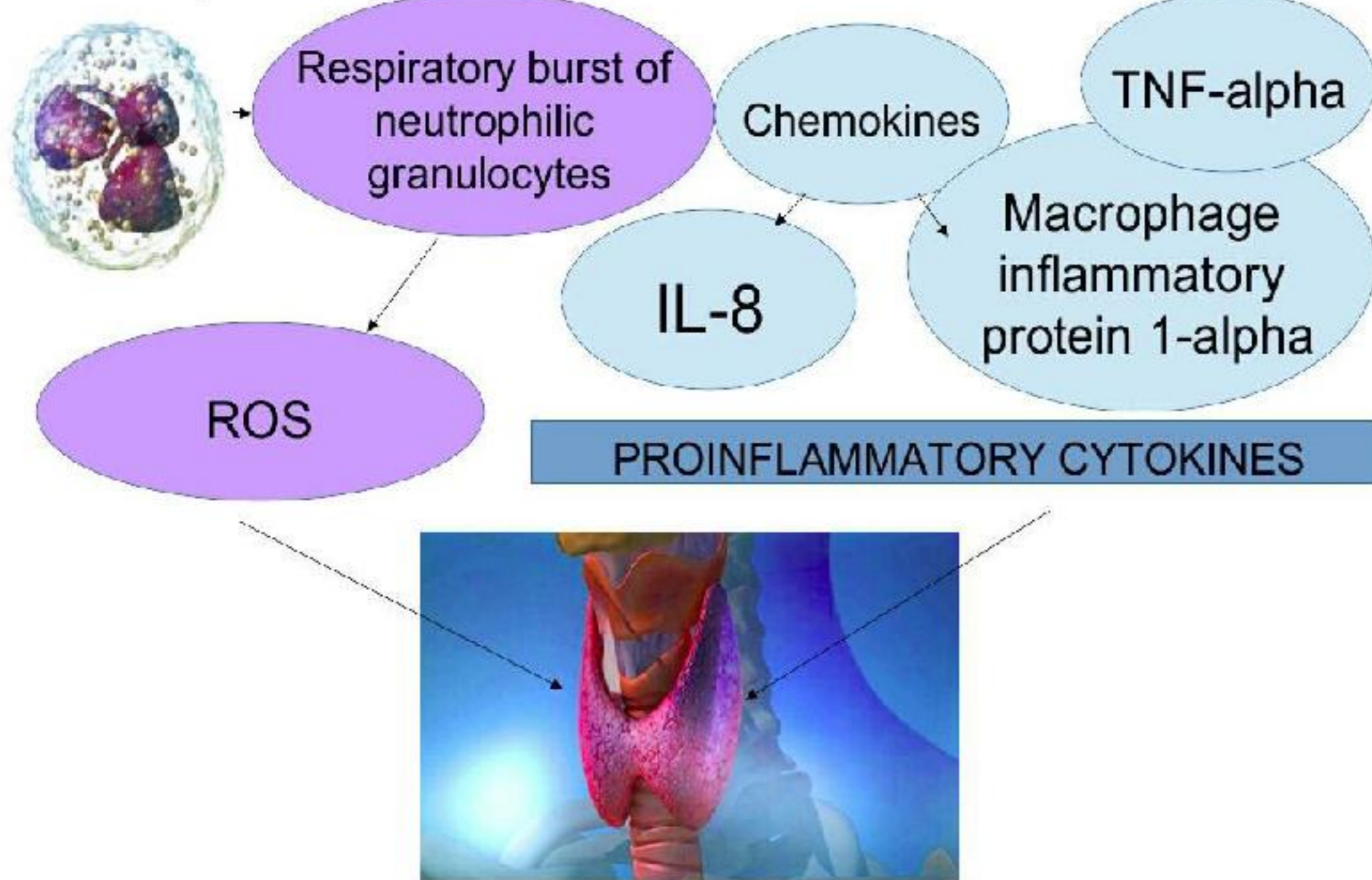
Increased chemiluminescence activity of blood neutrophilic granulocytes from patients with Graves' disease

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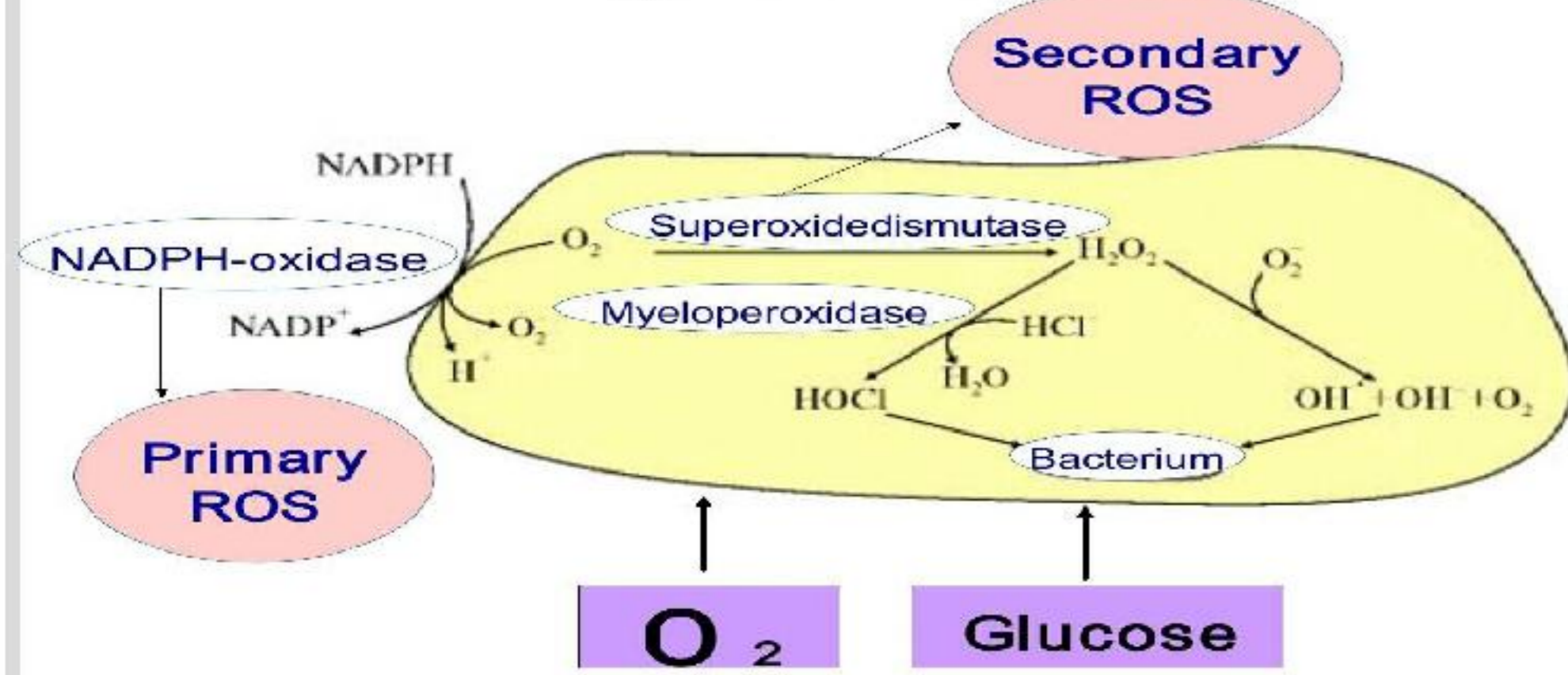
OBJECTIVES

The role of neutrophilic granulocytes in pathogenesis of Graves' disease



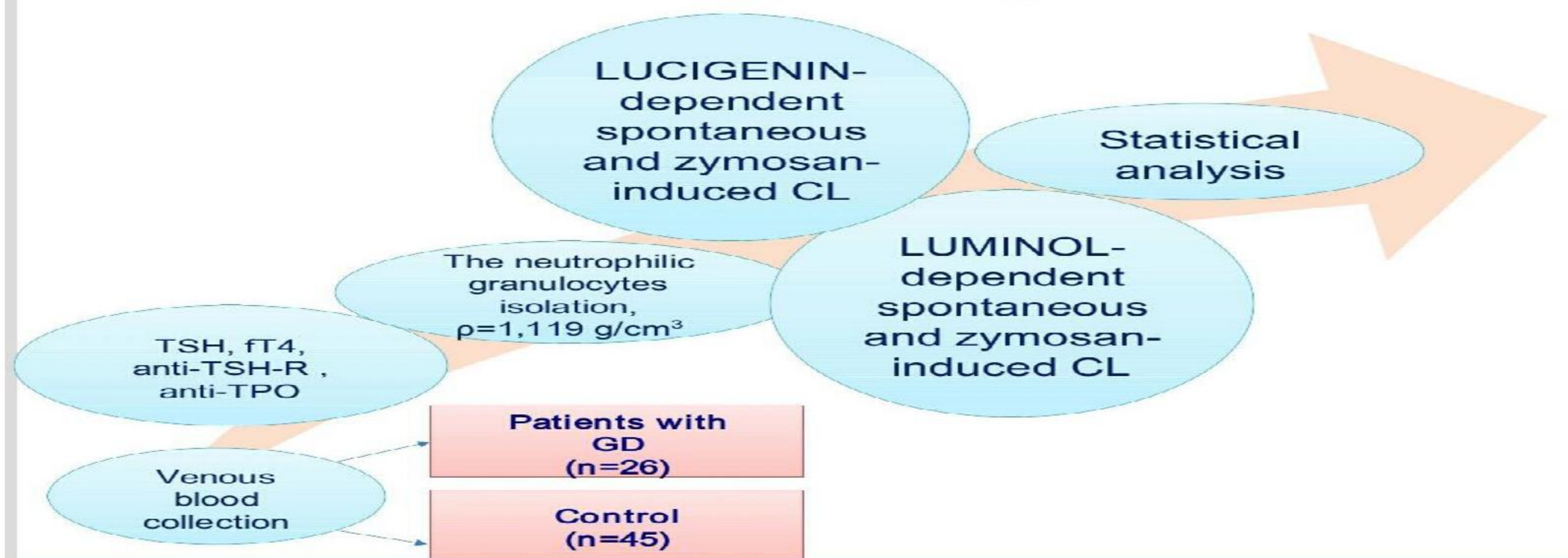
Aim: to investigate chemiluminescent (CL) activity of blood neutrophilic granulocytes in patients with Graves disease (GD).

The respiratory burst of neutrophilic granulocytes



METHODS

Study design



Twenty six women, mean age $40,7 \pm 13,2$, with manifestation of GD up to antithyroid therapy and 30 sex- and age-matched healthy subjects were examined. Serum thyroid hormone concentrations were measured by RIA. The median of TSH, fT4, anti-TSHR and anti-TPO concentration in GD patient were 0,17 (0,01; 0,72) mU/l, 17,9 (13,1; 30,3) pmol/l, 16,81 IU/l and 374,0 (223,0; 817,4) IU/ml respectively. The neutrophilic granulocytes were isolated from heparinized whole blood by double density gradient centrifugation in the ficoll-urografin: $\rho=1,077 \text{ g/cm}^3$ for lymphocytes separation, $\rho=1,119 \text{ g/cm}^3$ for the neutrophils isolation. The spontaneous and zymosan-induced (ZiCL) was studied for 90 minutes on 36-channel chemiluminescent analyzer "CL3606". The following characteristics have been identified: time to maximum (Tmax), maximum intensity value (Imax), reflecting the maximum reactive oxygen species (ROS) level synthesis and the area under the curve (S), describing total synthesis of ROS during 90 min. of the study.

RESULTS

Fig. 1. The indicators of spontaneous (a) and zymosan-induced (b) CL in patient with GD (n=26) and control group (n=45).

a) The indicators of spontaneous CL in patients with GD and control group



b) The indicators of zymosan-induced (ZiCL) in patients with GD and control group

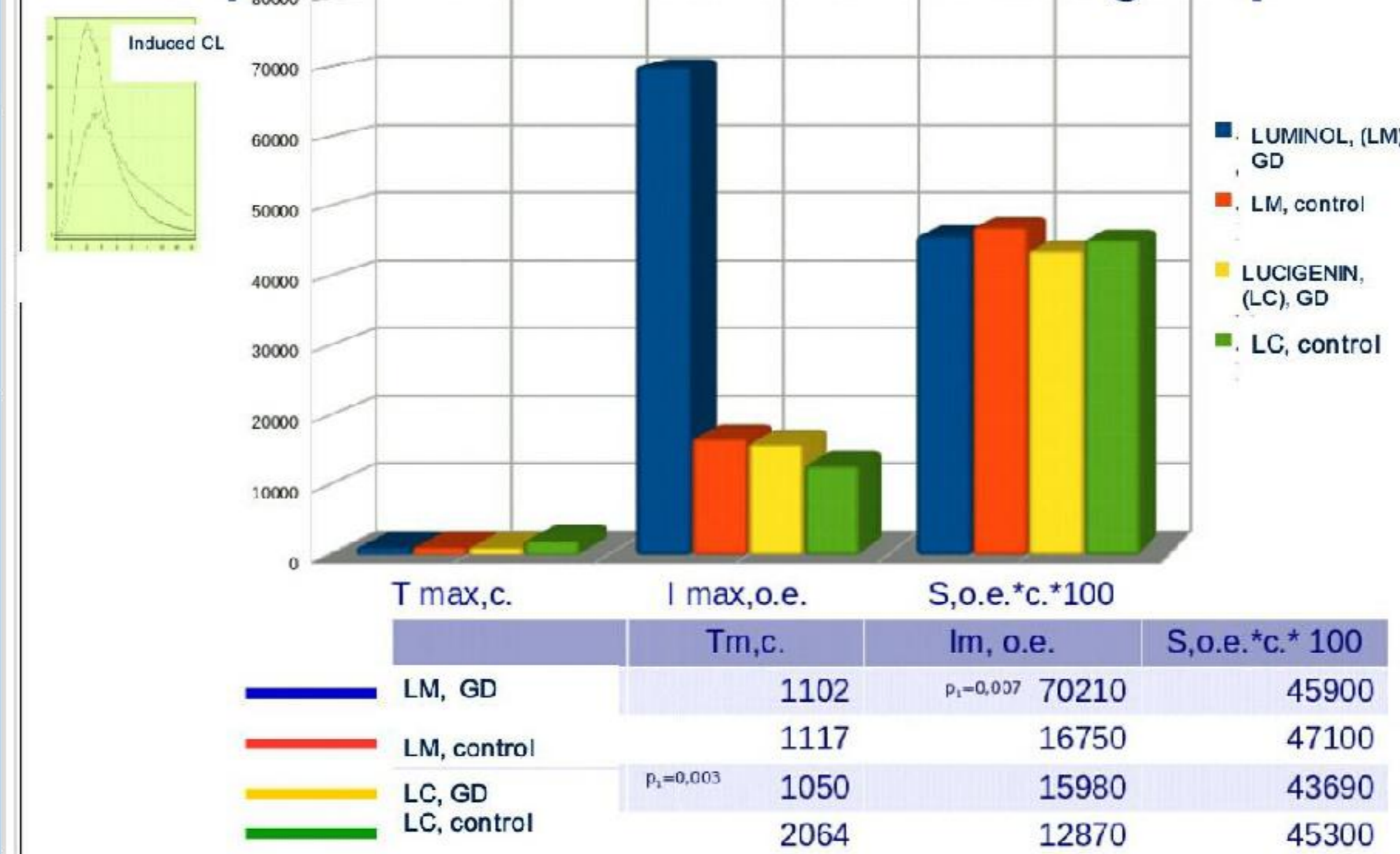


Fig. 2. The pathological interaction between autoimmune thyroid marker and CL indicators in patients with GD (n=26).

The Spearman correlation in anti-TPO level & CL indicators of blood neutrophils in patients with GD

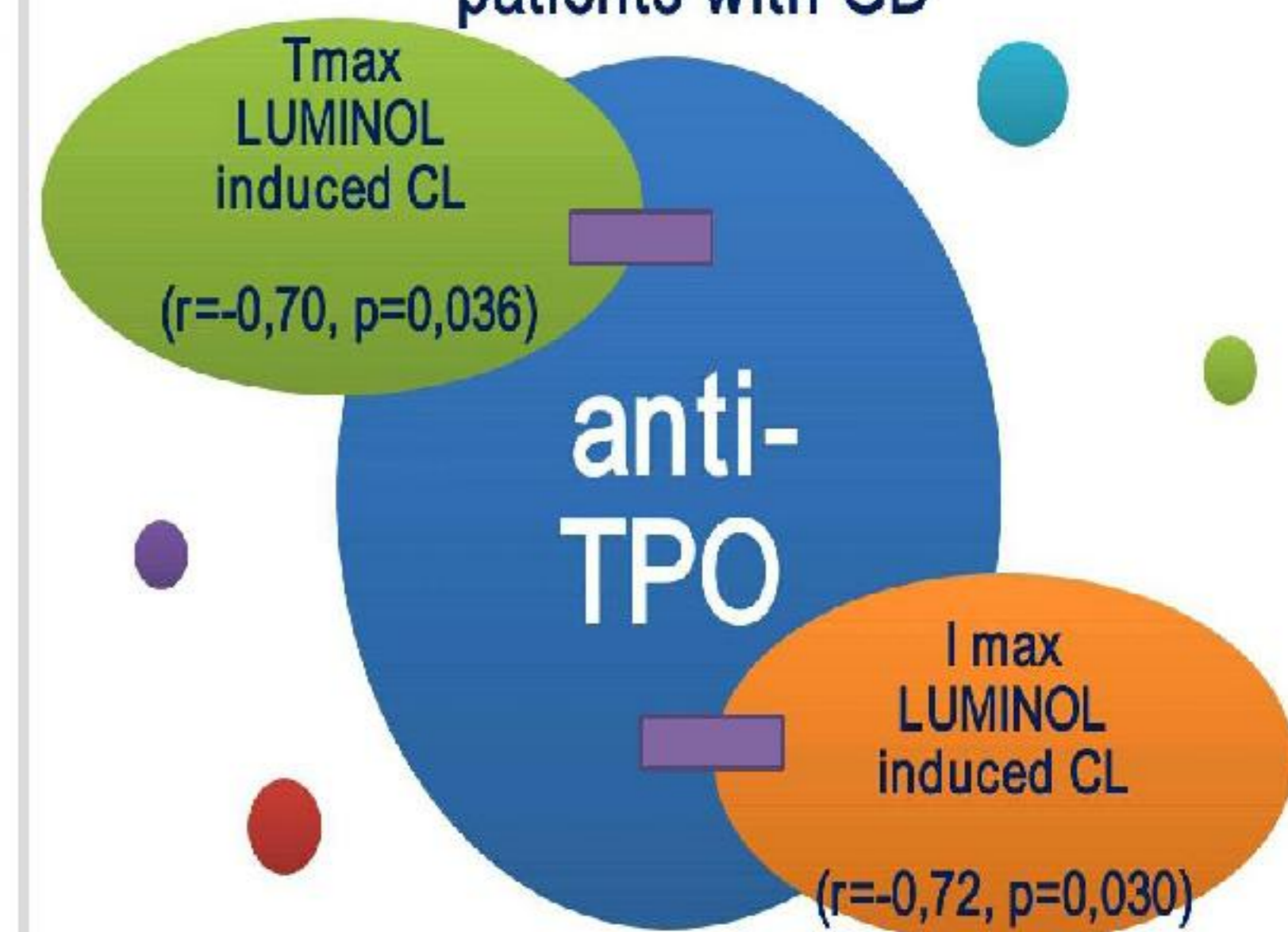
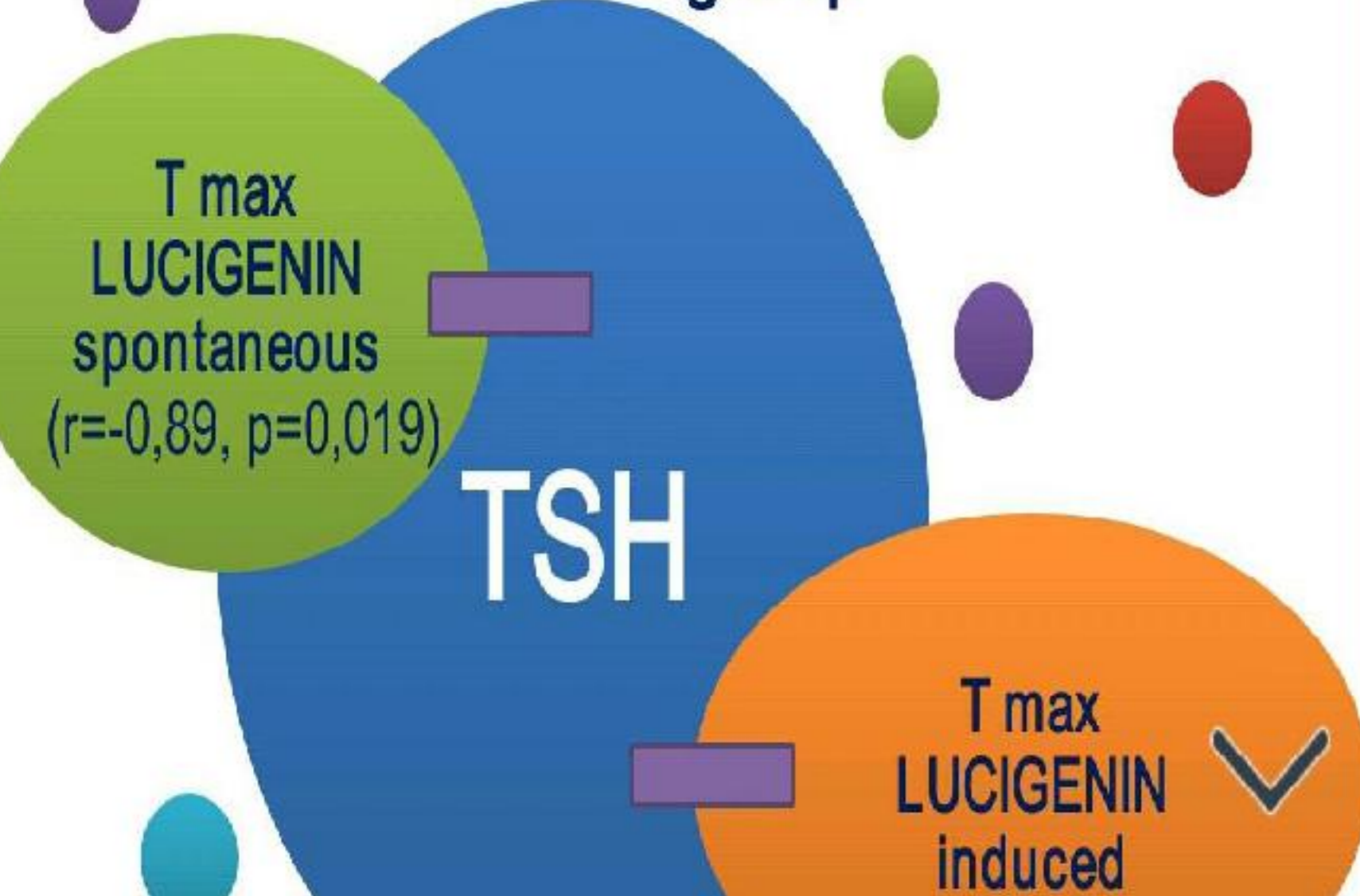
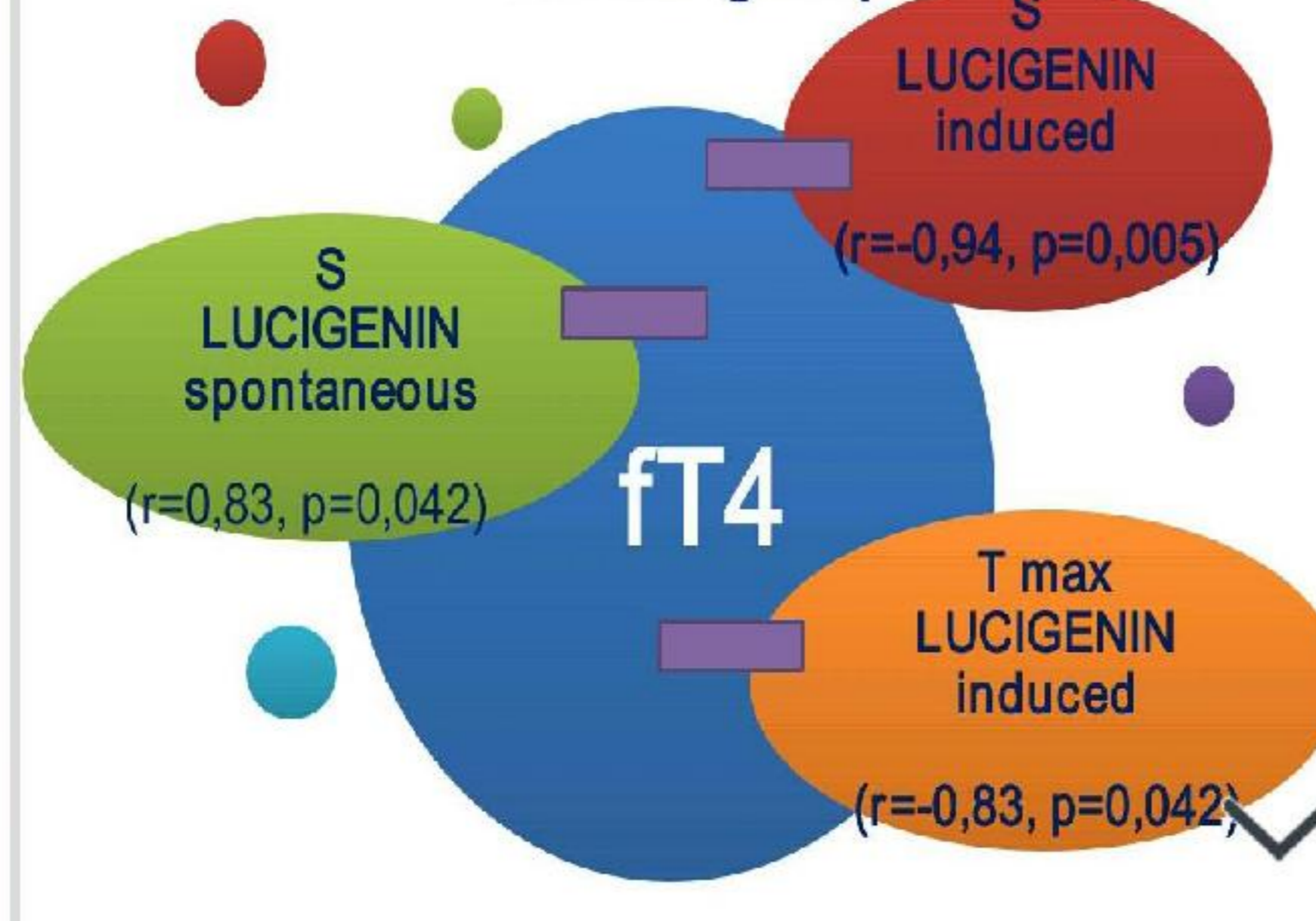


Fig. 3. The interaction between thyroid hormone and CL indicators in healthy controls (n=45).

The Spearman correlation in TSH level & CL indicators of blood neutrophils in control group



The Spearman correlation in fT4 level & CL indicators of blood neutrophils in control group



CONCLUSIONS

Hyperactivity and reactivity of peripheral blood neutrophils in GD certify by respiratory explosion in spontaneous and induced of secondary ROS level synthesis. Enhanced excitability to phagocytosis-related stimuli can mediate the autoimmune mechanism in GD.

References

- 1) Urazova OI, Kravets EB, Novitsky VV et al. Clin and experimental thyroidology 2007; 3 (4) :49-53.
- 2) Savchenko AA, Borisov AG. Novosibirsk: Science 2012 263 p.
- 3) Krieger CC, Neumann S, Place RF et al. J Clin Endocrinol Metab 2015;100(3):1071-1077.

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